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ENGLISH FOR BIOLOGY & MEDICINE

TEXTBOOK

KIEV - 2019

УДК 811.111:61+57](075)
ББК 81.2Англ:5;28

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К53 English for biology & medicine (Английский язык для биологии и медицины: бакалавров и магистров) : учебник / Л. В. Кнодель. – Киев : ФОП Кандиба Т. П., 2019. – 376 с.

Терминология в условиях ускорения научно-технического прогресса приобретает особое значение. Она является источником получения информации, инструментом освоения специальности. Любая область науки и техники находит своё выражение в терминах.

Практически нет ни одной области знания, которая изучается, не владея терминологией.

Медицинская терминология является одним из специфических пластов лексики, которая в силу особенностей структурно-семантического, словообразовательного и стилистического характера отличается от общеупотребительных слов и занимает особое место в лексической системе языка.

Медицинская терминология – это пласт лексического фонда со своими специфическими особенностями, ибо в каждом профессиональном подъязыке существует номенклатурная лексика, соотносимая с определенными реалиями и объектами. Особенность словарного состава терминологии заключается в том, что её номены представлены в ней шире, многообразнее, чем в других лексических подсистемах. Выбор английского языка в качестве второго языка сопоставительного исследования обусловлен его все возрастающей коммуникативной ролью в мировом сообществе, популярностью, сегодняшней жизненной необходимостью.

Учебник предназначен для бакалавров и магистров в сфере биологии и медицины. Он состоит из 4 глав и параграфов. В каждой главе дается целый ряд основных лексических номенов, помогающие понять сложные тексты из неадаптированных источников этой сферы.

Также прилагается несколько десятков упражнений для лучшего понимания и усвоения данного материала. Красочные иллюстрации наглядно демонстрируют основные положения и понятия в сфере биологии и медицины.

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ПРЕДИСЛОВИЕ

Медицинская терминология является одной из специфических пластов лексики, которая в силу особенностей структурно-семантического, словообразовательного и стилистического характера отличается от общеупотребительных слов и, тем самым, занимает особое место в лексической системе языка. Несмотря на немалое количество имеющихся трудов, как в отечественной, так и в зарубежной литературе, лингвистический аспект изучения терминологической лексики ещё нуждается в глубинных её исследованиях.

Неисчерпаемость проблематики данного лексического пласта привлекает и сегодня лингвистов – исследователей к открытию её новых качеств, сторон, характеристик, особенностей как подсистемы языка. Медицинская терминология – это пласт лексического фонда со своими специфическими особенностями, ибо в каждом профессиональном подъязыке существует номенклатурная лексика, соотносимая с определенными реалиями и объектами.

Следует отметить, что на современном этапе медицинские термины широко распространены в разговорной речи, литературном языке, в сфере здравоохранения, медицинской деятельности, науки.

Однако до сих пор применение медицинских терминов в английском и русском языках не были предметом серьезного, обстоятельного исследования. Дальнейшее развитие медицинской терминологии требует соответствующего исследования и упорядочения.

По мнению ученых, «неупорядоченность медицинской терминологии, как в русском, так и в других языках продолжает оставаться серьезным препятствием при обмене научной информацией, при её машинной обработке, создаёт большие затруднения при адекватном научном переводе медицинской литературы».

Терминологическая лексика представляет собой совокупность специальных наименований, объединенных в терминосистемы. Каждая терминосистема отражает категориальный аппарат, систему понятий конкретных наук, научных направлений, школ. Специальная терминология каждой науки объединяет наименования категорий и понятий: объектов, явлений и их закономерных связей, отношений, свойств, признаков, качеств, процессов.

Медицинская терминология, представляет собой одну из микросистем, которая входит в словарный состав современного английского и русского языков. Эта микросистема, как известно, обладает, с одной стороны, особенностями, присущими общелитературному языку, а с другой стороны, ей свойственна своя ярко выраженная специфика.

Учебник английского языка для биологов и медиков на уровне бакалавров и магистров представляет собой уникальное издание, в котором около 100 оригинальных текстов, диалогов и целый ряд лексико-грамматических упражнений, которые помогают понять и усвоить медицинскую терминологию и дают возможность пользоваться ею в повседневной практике.

Учебник точно структурирован. В большом количестве предлагается терминологическая лексика с переводом, что облегчает понимание медицинской терминологии.

В помощь студентам, изучающим английский язык, даются приложения с многочисленными данными и интересной информацией.

В конечном результате прохождение данного курса поможет студентам легко и свободно ориентироваться в своем профессиональном поле и найти себя, как в практической, так и в научной деятельности.

C H A P T E R I. HISTORY OF MEDICINE
UNIT I. STAGES OF HISTORICAL DEVELOPMENTS

A BRIEF HISTORY OF MEDICINE

No doubt human kind has tried to alleviate its suffering throughout history, but the earliest medical systems and writings seem to originate in Asia around 2000 B.C. The earliest medical texts dating to this time are The Yellow Emperor's Inner Canon of Medicine, the Divine Husbandman's Materia Medica, the Canon of Problems, and the Treatise of Cold Damage Disorders.

The first two of these works were scriptural in status, considered as compromising the wisdom and teachings of legendary sages. These texts could not be challenged, since they were the word of gods.

The second two were fundamental, but nevertheless still regarded as human knowledge which in exceptional circumstances could be queried.

Nowadays we look at such attitudes to medicine with suspicion, but in China change did not, and to some extent still does not, have the value it does in the West.

Stability of the state was linked to stability of the body. Medical systems were based on invisible energy channels, and such things can never be seen, tested or verified. For this reason, apart from any benefits it might involve, Asian medicine has had great durability through history. There was simply nothing physical to challenge or disprove.

In many ways Asian medicine remains now as it was in 2000 B.C. As a massage therapist, some of the techniques I've used constitute a kind of living ancient history. It was in ancient Greece that medicine was placed on a more recognisably modern footing, when Hippocrates (460-377 B.C.) rejected a supernatural basis for healing and disease. Ironically, however, the writings of Greek doctors such as Hippocrates were venerated in their turn, so that Greek medicine came to be regarded ironically with the same unquestioning reverence as ancient supernatural Chinese texts.

Once again some awkward person had to come along to start questioning what had long been thought to be true. That awkward person was the anatomist Vesalius (1514-1564) who realised that some of the things which Greek doctor Galen had said were incorrect.

Vesalius realised that Galen was wrong about the pattern of blood flow through the heart. Unlike invisible energy flows of Chinese medicine, blood flow was something physical. There was something to see, to challenge, and that's what Vesalius had the courage to do. By 1527 the even more awkward Paracelsus, town physician at Basle, burned Avicenna's *Canon,* the most revered text of learned medicine, and a number of books by Galen. The early 1600s saw William Harvey developing an understanding of circulation, showing that circulation depended on the heart, rather than on arteries pumping blood. He had travelled to Padua and obeyed pleas of the Paduan anatomists to see for oneself.

In 1600 the microscope had been invented by Dutch spectacle makers, and this device, combined with a new willingness to look, meant that Western medicine began to develop a more scientific approach. In fact it was in the field of medicine that science, the use of direct observation in the gathering of knowledge, truly began. Into the 18th century, pharmacology became hugely influential in medicine. Plants had been used since ancient times to relieve symptoms, and the first botanic garden in Britain devoted solely to growing medicinal plants was the Oxford Botanic Garden, opened in 1633.

The Chelsea Physic Garden followed soon after in 1673. Halls's Croft in Stratford, house of seventeenth century doctor John Hall, has a range of herbs that would have been used in his practice. Pharmacology came about when efforts were made to isolate substances in plants that were having a therapeutic effect.

The beginnings of modern pharmacy can be traced to the work of Pierre-Joseph Pelletier, and Francois Magandie. Early in the 19th century these two French men began to isolate therapeutic substances from plants. As early as 1809 Magandie was getting close to isolating strychnine.

By 1817 Pelletier was using mild solvents to isolate all kinds of plant substances. Perhaps the most important of these was quinine, which allowed treatment of malaria. The next step was to put these substances into a convenient form. Initially pills were produced in a pharmacy, with the pharmacist combining different powers using glucose syrup, cutting up the resulting mass, and then rolling the cut pieces in talc or, if their customers were rich, in silver or gold, to produce a finished pill.

Mass production of sugar coated pills started in France. Then in 1866 R.Warner of Philadelphia refined the pill making process and began production of small pills. Gelatine capsules went into general use in 1875. Tablet compressing machines were introduced in England by William Brokeden in 1843, and in the USA by Jacob Denton in 1864. Henry Wellcome teamed up with Silias Burroughs, set themselves up in Holborn, and brought medicines to Britain in the form of mass produced tablets.

A highpoint for pharmacology then came in 1928 when Alexander Fleming isolated penicillin from a mould growing in a petri dish in his laboratory at St Mary's Hospital, Paddington. By 1941 penicillin was allowing effective treatment of bacterial infection, which represented a massive step forward in medicine. In tandem with pharmaceutical advance, surgery was also making great strides.

Back in the early 19th century when poet John Keats was training to be a surgeon at Guys hospital, the only anaesthetic was alcohol. This meant surgery was confined to amputations, and to dealing with superficial complaints. There was an operation to remove bladder stones that took over an hour and involved entering the bladder from the back. It doesn't bear thinking about. Keats worked at Guys and St. Thomas's between 1809 and 1816, and it was at about this time that anaesthetics were first developing. Humphrey Davy discovered nitrous oxide in 1799, and in 1805 Serturner isolated the active ingredient from opium derived from poppies, and named it morphine. It wasn't until the 1840s, however, that anaesthetics were used in surgery.

William Thomas Morton performed the first surgery using nitrous oxide in Boston in October 1846. Local anaesthesia was first used by Doctor Carl Koller, in eye surgery in 1884.

The history of surgery and of the herbal medicine that preceded pharmacology can be explored at the Old Operating Theatre and Herb Garret in Southwark London, housed in what was once the chapel of St Thomas's Hospital. (St Thomas's is also relevant to the history of nursing.

More details can be found on our page dedicated to The Florence Nightingale Museum.) All these advances, then had to be combined with a change in attitude to public health. A survey in the 1840s found two thousand eight hundred and fifty people people living in ninety five decrepit houses in the St Giles area of London. These conditions bred disease, and between November and December 1847 half a million Londoners were infected with Typhus, out a population of two and a half million.

Cholera was also endemic due to poor sanitation. A breakthrough came in 1854 when John Snow worked out that cholera was a water bourne infection, and that all cases in Soho at that time related to the use of water from one pump.

In 1855 Snow advocated massive improvements in drainage and sewerage systems. The summer of 1858 saw the "Great Stink" when the Thames became for all intents and purposes, an open sewer.

Since Parliament sat right next to the Thames, minds were focused and work started on a sewerage system which was completed by 1875. Millions of lives were saved by this work, and the Crossness Pumping Station in west London is as relevant to the history of medicine as the Old Operating Theatre. These developments coming together meant that medicine was much more powerful by the twentieth century. We should not, however, get too carried away with the supposed scientific basis of modern Western medicine. The first randomised trial of a medicine using human subjects did not take place until 1946, with the trial of streptomycin in the treatment of tuberculosis. Medicine remains a mysterious, and often irrational business.

The colour of a drug, seemingly only used to ease visual identification, has a bearing on how effective it is perceived to be. People continue to buy medicines which have no proven effect, and this is true of "mainstream" as well as complimentary medicine.

The British National Formulary, the Bible of pharmacy in Britain, dismissed many best selling over the counter medicines as having no effect at all. It seems people were wasting their money on sugary throat pastilles, antiseptic creams, and cough medicines.

A display at the Royal Pharmaceutical Society Museum told me that in 2005 £96.7 million was spent on cough medicine, while the British National Formulary has the following to say about the ingredients in such medicines: "Expectorants are claimed to promote expulsion of bronchial secretions but there is no evidence that any drug can specifically facilitate expectoration. The assumption that sub-emetic doses of ammonium chloride, ipecacuanha and squill promote expectoration is a myth.

However, a simple expectorant mixture may serve a useful placebo function and has the advantage of being inexpensive." To a large extent medicine remains the mysterious business it has always been. There is evidence that as medical techniques improve people actually start to feel worse about themselves. Although the first part of the twentieth century saw huge advance in medical care, a study quoted by Roy Porter found that between 1928 and 1931 self-reported illness increased by one and a half times. It is often assumed that stroke and heart disease are increasing, when in fact between 1971 and 1991 stroke deaths declined by 40% and coronary heart disease fatalities by 19%.

Although in most instances a decline in health is more perceived than real, it is a sad fact that the war on bacteria and viruses actually creates new strains to defeat our medicines.

The Greeks, those clever people who first looked at medicine in a rational way, already seemed aware of the paradox of medicine. The word "pharmakos", from which we derive our modern word "pharmacy", denoted both medicine and poison, and the god Apollo was the god of physic, and the sender of disease. Perhaps we should remember that life is contradictory at its base. Bodies are continually breaking themselves down and renewing themselves in an endless cycle of death and rebirth. Medicine cannot hope to stop this process and produce some kind of endless stability. We cannot put up an impenetrable wall between us and the rest of life.

The borders between us and the microbial "enemies" we fight are not clear. In the end medicine remains as mysterious as those invisible Chinese energy channels.

The history of medical science, considered as a part of the general history of civilization, should logically begin in Mesopotamia, where tradition and philological investigation placed the cradle of the human race. However, in a condensed article such as this, there are important reasons which dictate the choice of another starting point.

Modern medical science rests upon a Greek foundation, and whatever other civilized peoples may have accomplished in this field lies outside our inquiry. It is certain that the Greeks brought much with them from their original home, and also that they learned a great deal from their intercourse with other civilized countries, especially Egypt and India; but the Greek mind assimilated knowledge in such a fashion that its origin can rarely be recognized. All human societies have medical beliefs that provide explanations for birth, death, and disease. Throughout history, illness has been attributed to witchcraft, demons, adverse astral influence, or the will of the gods.

These ideas still retain some power, with faith healing and shrines still used in some places, although the rise of scientific medicine over the past millennium has altered or replaced many of the old beliefs. The ancient Greek symbol associated with medicine the world over: the rod of Asclepius with its single encoiled serpent. The ancient Sumerian god Ningishzida, the patron of medicine, accompanied by two gryphons. The World Health Organization, the Royal Society of Medicine, the American Medical and Osteopathic Associations, the British and the Australian Medical Associations are some of the bodies that incorporate it in their insignia.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Define the notion "medicine".

Medicine is the art and science of healing. It encompasses a range of health care practices evolved to maintain and restore health by the prevention and treatment of illness. Contemporary medicine applies health science, biomedical research, and medical technology to diagnose and treat injury and disease, typically through medication, surgery, or some other form of therapy.

The word "medicine" is derived from the Latin "ars medicina", meaning the art of healing.

Though medical technology and clinical expertise are pivotal to contemporary medicine, successful face-to-face relief of actual suffering continues to require the application of ordinary human feeling and compassion, known in English as bedside manner.

Exercise 3. Translate the words and phrases into Russian drawing up sentences with them.

Medicine; to practise medicine; to study medicine; to take a medicine for cold; to prescribe (a) medicine; cough medicine; nonprescription (over-the-counter) medicine; patent (proprietary) medicine; strong medicine.

Exercise 4. Describe the Prehistoric medicine.

Although there is no record to establish when plants were first used for medicinal purposes (herbalism), the use of plants as healing agents was depicted in the cave paintings discovered in the Lascaux caves in France, which have been radiocarbon dated to between 13,000 and 25,000 B.C.

Over time and with trial and error, over the generations a small knowledge base developed, as tribal culture developed into specialized areas. In many cases these materials were used ritually as magical substances by priests, shamans, or medicine men.

Well-known spiritual systems include animism (the notion of inanimate objects having spirits), spiritualism (an appeal to gods or communion with ancestor spirits); shamanism (the vesting of an individual with mystic powers); and divination (magically obtaining the truth). The field of medical anthropology studies the various prehistoric medical systems and their interaction with society. Shamans performed the "specialized jobs" of healing. Earliest records of dedicated hospitals come from Mihintale in Sri Lanka where evidence of dedicated medicinal treatment facilities for patients are found.

Early Greek doctor Hippocrates, who is called the Father of Medicine, and Galen laid a foundation for later developments in a rational approach to medicine. After the fall of the Western Roman Empire and the onset of the Dark Ages, the Greek tradition of medicine went into decline in Western Europe, although it continued uninterrupted in the Easern Roman Empire (Byzantium).

After 750, the Muslim Arab world had Hippocrates' and Galen's works translated into Arabic, and Islamic physicians engaged in some significant medical research.

Exercise 5. Render the score of Babylonian medicine.

The oldest Babylonian texts on medicine date back to the Old Babylonian period in the first half of the 2nd millennium BC. The most extensive Babylonian medical text, however, is the *Diagnostic Handbook* written by the physician Esagil-kin-apli of Borsippa, during the reign of the Babylonian king Adad-apla-iddina (1069-1046 B.C). Along with contemporary ancient Egyptian medicine, the Babylonians introduced the concepts of diagnosis, prognosis, physical examination, and prescriptions.

In addition, the *Diagnostic Handbook* introduced the methods of therapy and aetiology and the use of empiricism, logic and rationality in diagnosis, prognosis and therapy. The text contains a list of medical symptoms and often detailed empirical observations along with logical rules used in combining observed symptoms on the body of a patient with its diagnosis and prognosis.

The *Diagnostic Handbook* was based on a logical set of axioms and assumptions, including the modern view that through the examination and inspection of the symptoms of a patient, it is possible to determine the patient's disease, its aetiology and future development, and the chances of the patient's recovery. The symptoms and diseases of a patient were treated through therapeutic means such as bandages, creams and pills.

ANCIENT EGIPTIAN MEDICINE

The Ancient Egyptians, like the Ancient Greeks and Romans, have provided modern historians with a great deal of knowledge and evidence about their attitude towards medicine and the medical knowledge that they had. This evidence has come from the numerous papyruses found in archaeological searches. However, their knowledge was based on an increasing knowledge of the human anatomy and plain commonsense. In Ancient Egypt, the treatment of illnesses was no longer carried out only by magicians and medicine men. We have evidence that people existed who were referred to physicians and doctors.

"It is seven days from yesterday since I saw my love,
And sickness has crept over me,
My limbs have become heavy,
I cannot feel my own body.
If the master-physicians come to me,
I gain no comfort from their remedies.
And the priest-magicians have no cures,
My sickness is not diagnosed.
My love is better by far for me than my remedies.
She is more important to me than all the books of medicine."

An Ancient Egyptian love poem written in about 1500 B.C.

Early records on medicine have been discovered from early Ayurvedic medicine in the Indian subcontinent, ancient Egyptian medicine, traditional Chinese medicine and ancient Greek medicine.

Like prehistoric man, some of the beliefs of the Egyptians were based on myths and legend. Archaeological digs have also found evidence of men titled physicians.

The hieroglyphics on the door to the tomb of Irj described him as a physician at the court of the pharaohs. Irj lived about 1500 B.C. He was described as a: "palace doctor, superintendent of the court physicians, palace eye physician, palace physician of the belly and one who understands the internal fluids and who is guardian of the anus." Physicians lived even earlier in Ancient Egypt. Imphotep was the physician to King Zozer and lived in about 2600 B.C.

Imphotep was considered so important that he was, after his death, was worshipped as a god of healing. Almost all of our knowledge about Ancient Egyptian medical knowledge comes from the discoveries of papyrus documents. The very dry atmosphere in Egypt has meant that many of these documents have been very well preserved despite their age. Numerous papyrus documents have come from the era 1900 B.C. to 1500 B.C. It is from these documents that we know that the Ancient Egyptians still believed that the supernatural caused some disease. When there was no obvious reason for an illness, many Ancient Egypt doctors and priests believed that disease was caused by spiritual beings. When no-one could explain why someone had a disease, spells and magical potions were used to drive out the spirits.

Some of these spells were: "These words are to be spoken over the sick person. "O Spirit, male of female, who lurks hidden in my flesh and in my limbs, get out of my flesh. Get out of my limbs!"

This was a remedy for a mother and child. "Come! You who drives out evil things from my stomach and my limbs. He who drinks this shall be cured just as the gods above were cured."

This was added at the end of this cure: "This spell is really excellent – successful many times."

It was meant to be said when drinking a remedy. This was a remedy for people going bald: "Fat of lion, fat of hippo, fat of cat, fat of crocodile, fat of ibex, fat of serpent, are mixed together and the head of the bald person is anointed with them." The Ancient Egyptians had a god who would frighten away evil spirits – Bes. Despite this use of remedies that come from a lack of knowledge, the Ancient Egyptians also developed their knowledge as a result of education. Ancient papyrus informs us that the Ancient Egyptians were discovering things about how the human body worked.

They knew that the heart, pulse rates, blood and air were important to the workings of the human body. A heart that beat feebly told doctors that the patient had problems. The Ancient Egyptians wrote down their knowledge and this is found on what is known as the Papyrus Ebers: "46 vessels go from the heart to every limb, if a doctor places his hand or fingers on the back of the head, hands, stomach, arms or feet then he hears the heart. The heart speaks out of every limb." The papyrus continues: "There are 4 vessels to his nostrils, 2 give mucus and 2 give blood:

There are 4 vessels in his forehead; there are 6 vessels that lead to the arms; there are 6 vessels that lead to the feet; there are 2 vessels to his testicles (and) it is they which give semen; there are 2 vessels to the buttocks." The document actually gives names to organs such as the spleen, the heart, the anus, the lungs etc so they must have known that these exist. One papyrus, the Edwin Smith Papyrus, has a detailed description of the brain in it so this organ was also well researched by the standards of the time. It is probable that this knowledge came as a result of the practice the Ancient Egyptians had of embalming dead bodies. The work of an embalmer was described in detail by Herodotus who was from Greece but was visiting Ancient Egypt in the 5th ycentury.

He wrote "First they take a crooked piece of metal and with it draw out some of the brain through the nostrils and then rinse out the rest with drugs. Next they make a cut along the side of the body with a sharp stone and take out the whole contents of the abdomen.

After this they fill the cavity with myrrh, cassia and other spices and the body is placed in natron for 70 days." "First they take a crooked piece of metal and with it draw out some of the brain through the nostrils and then rinse out the rest with drugs. Next they make a cut along the side of the body with a sharp stone and take out the whole contents of the abdomen. After this they fill the cavity with myrrh, cassia and other spices and the body is placed in natron for 70 days."

Those organs that were removed in the embalming process, were put in a jar along with preserving spices, and put into the tomb of the person being buried. Though religious law forbade the embalmers from studying the body, it is almost certain they would have gained some knowledge of the human anatomy simply from the work that they did. During three thousand years of history, Ancient Egypt developed a large, varied and fruitful medical tradition. Herodotus described the Egyptians as "the healthiest of all men, next to the Libyans", due to the dry climate and the notable public health system that they possessed. According to him, "the practice of medicine is so specialized among them that each physician is a healer of one disease and no more." In the *Odyssey*, Homer describes Egypt as a land where "the earth, the giver of grain, bears greatest store of drugs" and where "every man is a physician."

Although Egyptian medicine, to a good extent, dealt with the supernatural, it eventually developed a practical use in the fields of anatomy, public health, and clinical diagnostics.

Egyptian physicians were described in early diplomatic documents. Their high reputation was owed to their skills as diagnosticians and as surgeons. The ritual of handling a corpse, Mummification in Egypt seemed to enhance knowledge on human body. It is an open debate whether the removal of the organs in mummification amounted to anatomy and whether the knowledge of the mummifiers was passed onto the physicians. Medical information in the Edwin Smith Papyrus may date to a time as early as 3000 B.C.

The earliest known surgery in Egypt was performed in Egypt around 2750 B.C. Imhotep in the 3rd dynasty is sometimes credited with being the founder of ancient Egyptian medicine and with being the original author of the Edwin Smith papyrus, detailing cures, ailments and anatomical observations.

The Edwin Smith papyrus is regarded as a copy of several earlier works and was written circa 1600 B.C. It is an ancient textbook on surgery almost completely devoid of magical thinking and describes in exquisite detail the *examination, diagnosis, treatment,* and *prognosis* of numerous ailments. Conversely, the Ebers papyrus (c. 1550 B.C.) is full of incantations and foul applications meant to turn away disease-causing demons, and other superstition. The Ebers papyrus provides our earliest possible documentation of ancient awareness of tumors. But ancient medical terminology was badly understood.

The Kahun Gynaecological Papyrus treats women's complaints, including problems with conception.

34 cases detailing diagnosis and treatment survive, some of them fragmentarily.

Dating to 1800 B.C., it is the oldest surviving medical text of any kind. Medical institutions, referred to as *Houses of Life* are known to have been established in ancient Egypt as early as the 1st Dynasty. By the time of the 19th Dynasty some workers enjoyed such benefits as medical insurance, pensions and sick leave. The earliest known physician is also credited to ancient Egypt: Hesyre, "Chief of Dentists and Physicians" for King Djoser in the 27th century B.C. Also, the earliest known woman physician, Peseshet, practiced in Ancient Egypt at the time of the 4th dynasty. Her title was "Lady Overseer of the Lady Physicians".

Exercise 1. Digest the score of the information briefly in English.

Exercise 2. Give the essentials of Egyptian medicine.

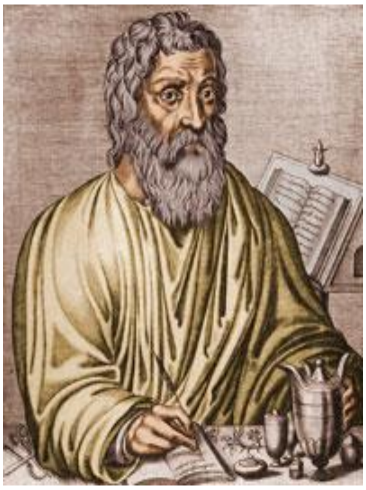
Exercise 3. Define mythical, Homeric, and pre-Hippocratic times.

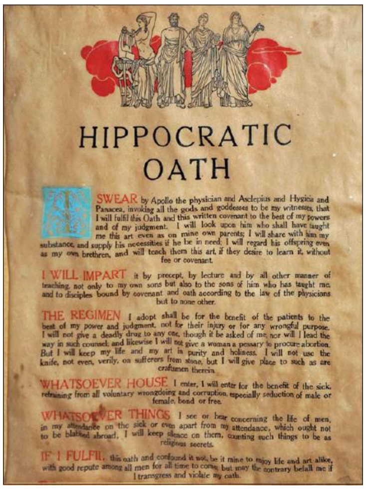
Greek medical science, like that of all civilized peoples, shows in the beginning a purely theurgical character. Apollo is regarded as the founder of medical science, and, in post-Homeric times, his son Esculapius (in Homer, a prince) is represented, as the deity whose office it is to bring about man's restoration to health by means of healing oracles. His oldest place of worship was at Tricca in Thessaly. The temples of Esculapius, of which those at Epidaurus and Cos are the best known, were situated in a healthy neighbourhood. The sick pilgrims went thither that, after a long preparation of prayer, fasting and ablutions, they might, through of mediation of the priests, receive in their dreams the healing oracles. This kind of medical science already shows a rational basis, for the priests interpreted the dreams and prescribed a suitable treatment, in most cases purely dietetic.

Important records of sicknesses were made and left as votive-tablets in the temples. Side by side with the priestly caste, and perhaps out of it there arose the order of temple physicians, who, as supposed descendants of the god Esculapius, were known as the *Asclepiadae*, and formed a kind of guild or corporation. This separation of offices must have occurred at an early time, for even in Homer we find lay physicians mentioned, especially "the sons of Eseulapius", Machaon and Podalirius.

In the vegetable drugs of Egyptian origin mentioned in Homer we recognize the early influence of the country of the Pharaohs upon Greek medical science. The schools of the philosophers likewise exerted no small influence upon development, medical problems being studied by Pythagoras of Samos, Alcmaeon of Crotona, Parmenides of Elea, Heraclitus of Ephesus (6th century B.C.), Empedocles of Agrigentum, and Anaxagoras of Clazomenae (5th century B.C.).

The earliest medical schools were at Cyrene in Northern Africa, Crotona, Cnidus and Cos. From Cnidus came Euryphon and also Ctesias the geographer, who was at first physician in the army of Cyrus, after the battle of Cunaxa (401 B.C.), to Artaxerxes Memnon. Of greater interest is the medical school adjoining the shrine of Eseulapius at Cos, for from it arose the man who first placed medicine upon a scientific basis; whose name is even today well known to all physicians, Hippocrates.





HIPPOCRATIC OATH

I SWEAR by Apollo the physician and Asclepius and Hygieia and Panacea, invoking all the gods and goddesses to be my witnesses, that I will fulfil this Oath and this written covenant to the best of my powers and of my judgment. I will look upon him who shall have taught me this art even as on mine own parents; I will share with him my substance, and supply his necessities if he be in need; I will regard his offspring even as my own brethren, and will teach them this art, if they desire to learn it, without fee or covenant.

I WILL IMPART it by precept, by lecture and by all other manner of teaching, not only to my own sons but also to the sons of him who has taught me, and to disciples bound by covenant and oath according to the law of the physicians but to none other.

THE REGIMEN I adopt shall be for the benefit of the patients to the best of my power and judgment, not for their injury or for any wrongful purpose. I will not give a deadly drug to any one, though it be asked of me, nor will I lead the way in such counsel; and likewise I will not give a woman a pessary to procure abortion. But I will keep my life and my art in purity and holiness. I will not use the knife, not even, verily, on sufferers from stone, but I will give place to such as are craftsmen therein.

WHATSOEVER HOUSE I enter, I will enter for the benefit of the sick, refraining from all voluntary wrongdoing and corruption, especially seduction of male or female, bond or free.

WHATSOEVER THINGS I see or hear concerning the life of men, in my attendance on the sick or even apart from my attendance, which ought not to be blabbed abroad, I will keep silence on them, counting such things to be as religious secrets.

IF I FULFIL this oath and confound it not, be it mine to enjoy life and art alike, with good repute among all men for all time to come; but may the contrary befall me if I transgress and violate my oath.

***Exercise 4. Describe Hippocrates & the so-called* Corpus Hippocraticum.**

Tradition knows seven physicians named Hippocrates, of whom the second is regarded as the most famous. Of his life we know but little. He was born at Cos in 460 or 459 B.C., and died at Larissa about 379. How great his fame was during his lifetime is shown by the fact that Plato compares him with the artists Polycletus and Phidias. Later he was called "the Great" or "the Divine".

The historical kernel is probably as follows: a famous physician of this name from Cos flourished in the days of Pericles, and subsequently many things, which his ancestors or his descendants or his school accomplished, were attributed to him as the hero of medical science.

The same was true of his writings. What is now known under the title of "Hippocratis Opera" represents the work, not of an individual, but of several persons of different periods and of different schools. It has thus become customary to designate the writings ascribed to Hippocrates by the general title of the "Hippocratic Collection" (Corpus Hippocraticum), and to divide them according to their origin into the works of the schools of Cnidus and of Cos, and of the Sophists.

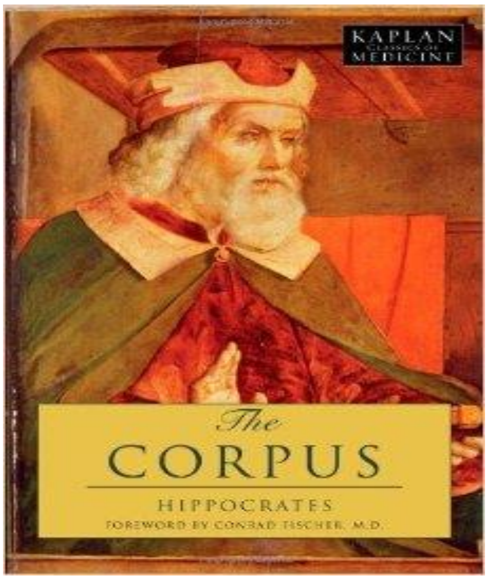
How difficult it is, however, to determine their genuineness is shown that even in the third century before Christ the Alexandrian librarians, who for the first time collected the anonymous scrolls scattered through Hellas, could not reach a definite conclusion. For the development of medical science it is of little consequence who composed the works of the school of Cos for they are more or less permeated by the spirit of one great master. The secret of his immortality rests on the fact that he pointed out the means whereby medicine became a science. His first rule was the observation of individual patients, individualizing in contradistinction to the schematizing of the school of Cnidus.

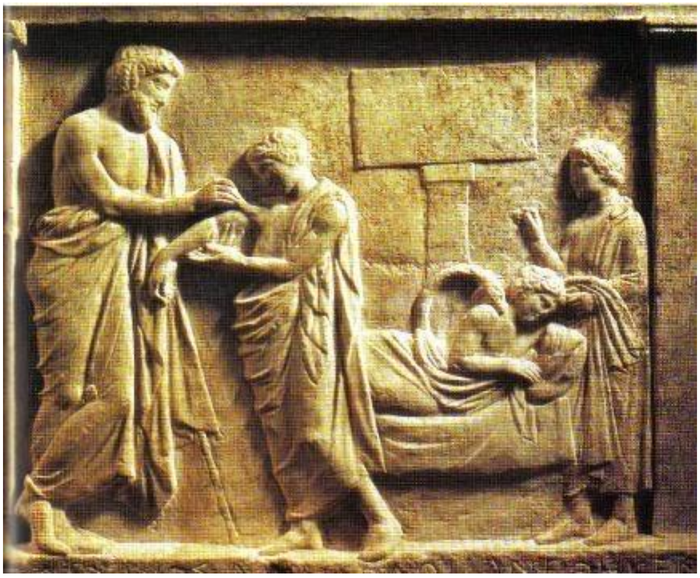
By the observation of all the principles were gradually derived from experience, and these, uniformly arranged, led by induction to a knowledge of the nature of the disease, its course, and its treatment.

This is the origin of the famous "Aphorismi", short rules which contain at times principles derived from experience and at times conclusions drawn from the same source. They form the valuable part of the collection. The school of Cos and its adherents, the Hippocratics, looked upon medical science from a purely practical standpoint; they regarded it as the art of healing the sick, and therefore laid most stress on prognosis and treatment by aiding the powers of nature through dietetic means.

The whole school of Cnidus prided itself upon its scientific diagnosis and, in harmony with money with the East, adopted a varied medicinal treatment.

The method which the school of Cos established more than 2000 years ago has proved to be the only one, and thus Hippocratic medial science celebrated its renascence in the 18th century with Boerhaave at Leyden and subsequently with Gerhard van Swieten at Vienna. In his endeavour to the truth the earnest investigation often reaches an impassable barrier. There is nothing more tempting than to seek an outlet by means of reflection and deduction. Such a delusive course may easily become fatal to the physicist; but a medical system, erected upon the results of speculative investigation, carries the germ of death within itself.





GREEK MEDICINE

Hippocratic Corpus, is a collection of around seventy early medical works from ancient Greece strongly associated with the ancient Greek physician Hippocrates and his teachings. Medicine in Ancient Greece was influenced by Babylonian and Egyptian medicinal traditions. As was the case elsewhere, the ancient Greeks developed a humoral medicine system where treatment sought to restore the balance of humours within the body. A towering figure in ancient Greek medicine was the physician Hippocrates of Kos, considered the "father of modern medicine."

Most famously, Hippocrates invented the Hippocratic Oath for physicians, which is still relevant and in use today. Hippocrates, regarded as the father of modern medicine, and his followers were first to describe many diseases and medical conditions. He is given credit for the first description of clubbing of the fingers, an important diagnostic sign in chronic suppurative lung disease, lung cancer and cyanotic heart disease. For this reason, clubbed fingers are sometimes referred to as "Hippocratic fingers".

Hippocrates was also the first physician to describe Hippocratic face in *Prognosis*. Shakespeare famously alludes to this description when writing of Falstaff's death in Act II, Scene III. of Henry V. Hippocrates began to categorize illnesses as acute, chronic, endemic and epidemic, and use terms such as, "exacerbation, relapse, resolution, crisis, paroxysm, peak, and convalescence."

Another of Hippocrates's major contributions may be found in his descriptions of the symptomatology, physical findings, surgical treatment and prognosis of thoracic empyema, i.e. suppuration of the lining of the chest cavity. His teachings remain relevant to present-day students of pulmonary medicine and surgery. Hippocrates was the first documented chest surgeon and his findings are still valid.

The *Plinthios Brokhos* as described by Greek physician Heraklas, a sling for the binding of fractured jaws. Preserved in one of Oribasius' collections. The Greek Galen was one of the greatest surgeons of the ancient world and performed many audacious operations – including brain and eye surgeries – that were not tried again for almost two millennia.

The works of Galen and Avicenna were translated into Latin, and the *Canon* remained the most authoritative text on anatomy in European medical education until the 16th century.

Later, in medieval Europe, Galen's writings on anatomy became the mainstay of the medieval physician's university curriculum along; but they suffered greatly from stasis and intellectual stagnation. In the 1530s, however, Belgian anatomist and physician Andreas Vesalius took on a project to translate many of Galen's Greek texts into Latin. Vesalius's most famous work, *De humani corporis fabrica*, was greatly influenced by Galenic writing and form. An ancient Greek patient gets medical treatment. This aryballos (circa 480-470 B.C., contained healing oil.

The Romans invented numerous surgical instruments, including the first instruments unique to womenas well as the surgical uses of forceps, scalpel, cautery, cross-bladed scissors, surgical needle, sound, and specula. Romans were also pioneers in cataract surgery.

Medieval medicine was an evolving mixture of the scientific and the spiritual. In the early Middle Ages, following the fall of the Roman Empire, standard medical knowledge was based chiefly upon surviving Greek and Roman texts, preserved in monasteries and elsewhere. Ideas about the origin and cure of disease were not, however, purely secular, but were also based on a spiritual world view, in which factors such as destiny, sin, and astral influences played as great a part as any physical cause. Oribasius was the greatest Byzantine compiler of medical knowledge.

Several of his works, along with many other Byzantine physicians, were translated into Latin, and eventually, during the Enlightenment and Age of Reason, into English and French.

The last great Byzantine Physician was Actuarius, who lived in the early 14^{th} century in Constantinople.

Medicine was notably not one of the seven classical Artes liberales, and was consequently looked upon more as a handicraft than as a science.

Exercise 1. Characterize Greek medicine.

Exercise 2. Characterize the Alexandrian period in medicine.

The desire to give to medicine a scientific basis found rich nourishment in the ancient civilized soil of Egypt under the Ptolemies. Herophilus of Chalcedon (c. 300 B.C.) and Erasistratus of Iulis (c. 330-240 B.C.) are mentioned in this connection. As anatomists, they were the first systematic investigators, and, following Hippocrates, they tried to complete clinical experience by exact methods.

This tendency was opposed by the empires, whose services lay solely in the field of drugs and toxicology. Erasistratus as well as Philinus, the empiric, attacked the doctrine of humors (humoral pathology), which developed out of the Hippocratic tendency. The former alone was a serious opponent since, as an anatomist, he looked for the seat of the disease in the solid parts, rather than in the four fundamental humors (blood, mucus, black and yellow gall) and their different mixtures.

Exercise 3. Give the main features of the dogmatic school.

In their endeavour to complete the doctrine of their great master, the successors of the Hippocratics fell victims to the snares of speculation. In spite of this, we owe to this so-called "dogmatic school" some fruitful investigation. Diocles Carystius advanced the knowledge of anatomy, and tried to fathom the causal connection between symptom and disease, in which endeavours he was imitated by Praxagoras of Cos, who established the diagnostic importance of the pulse. Unfortunately, there already began with Aristotle (38-22 B.C.) that tendency – later rendered so fatal through Galen's teaching – to regard organic structure and function not in accordance with facts but from the teleological standpoint.

Exercise 4. Explain the score of notion "methodizers".

One of the opponents of humoral pathology was Asclepiades of Prusa in Bithynia (c. 124 B.C.).

He tried to use in medicine the atomistic theory of Epicurus and Heracleides of Pontus. He taught that health and disease depend upon the motion of the atoms in the fine capillaries or pores, which, endowed with sensation, pass through the entire body.

With Themison as their leader, the followers of Asclepiades simplified his doctrine by supposing disease to be only a contraction or relaxation, and later only a mixed condition (partly contracted, partly relaxed) of the pores.

This simple and convenient explanation of all diseases without regard to anatomy and physiology, taken in conjunction with its allied system of physical dietetic therapeutics, explains why this doctrine enjoyed so long a life, and why the works of the methodist, Caelius Aurelianus of Sicca in Numidia (5th century A.D.), were diligently studied down to the 7th century.

Exercise 5. Digest the score of the information briefly in English.

Exercise 6. Answer the questions.

1. How many stages were in the development of ancient medicine? 2. How can you characterize the Greek and Roman medicine? 3. Can you render the score of Babylonian medicine?

Exercise 7. Give a short characteristic of Galen's life and work.

Departure from the Hippocratic observation of nature led physicians to form numerous mutually opposing sects. A man of great industry and comprehensive knowledge, Galen of Pergamum (c. A.D. 130-201), tried to rescue medical science from this labyrinth. He chose the path of eclecticism, on which he built his (as he thought) infallible system. Whatever sense-perception and clinical observation left obscure, he tried to explain in a speculative manner.

That this system of teaching could hold medicine in bondage until modern times shows the genius of the master, who understood how to cover up the gaps by brilliancy of style. Galen took the entire anatomical knowledge of his time, and out of it produced a work the substance of which was for centuries regarded as inviolable. His anatomy was to a large extent based upon the dissection of mammals, especially of monkeys, and, like his physiology, was under teleological influence.

His presentation of things lacks dispassionateness. Instead of explaining the functions of organs on the basis of their structure, Galen chose this reverse method. His anatomy and physiology were the most vulnerable part of his system, and an earnest re-examination of these fields must necessarily have shaken his entire scheme of teaching. Galen expressed the greatest respect for Hippocrates, published his most important works with explanatory notes, but never entered into the spirit of the school of Cos, although he adopted many of its doctrines. Galen is the culminating point and end of ancient Greek medical science.

Exercise 8. Describe the pre- Byzantine period in medicine.

In his vanity Galen thought he had completed all investigation, and that his successors had only to accept without effort what he had discovered. As will be shown in the paragraph, his advice was, unfortunately for science, followed literally.

Pedanus Dioscurides, who was from Anazarbe and lived in the time of Nero and Vespasian, may be mentioned here as the most important pharmaceutical writer of ancient times. He simplified greatly the pharmacopoeia, which had then assumed unwieldy dimensions, and freed it from ridiculous, superstitious remedies. Our modern pharmacology is based on his work, *Ta ton tylikon biblia*.

Cornelius Celsus (about 25-30 B.C. to A.D. 45-50) is the only Roman who worked with distinction in the medical field, but it is doubtful whether he was a physician. His work, "De re medica libri viii", which is written in classical Latin, and for which he used seventy-two works lost to posterity, gives a survey of medical science from Hippocrates to imperial times. Very famous is his description lithotomy. Celsus was altogether forgotten until the fifteenth century, when Pope Nicholas V (1447-55) is said to have discovered a manuscript of his works.

Exercise 9. Give the major traits of Byzantine period.

In Byzantine times medicine shows but little originality, and is of small importance in the history of medical development. The work handed down to us are all compilations, but as they frequently contain excerpts from lost works they are of some historical value. The notable writers of this period are: Oreibasios (325-403), physician in ordinary to Julian the Apostate; and Aëtius of Amida, a Christian physician under Justinian (597-66). A little more originality than these men exhibited was shown by Alexander of Tralles (525-605), and Paulus Egineta of the first half of the seventh century, of whose seven books, the sixth, dealing with surgery, was greatly valued in Arabian medicine.

Paulus lived at Alexandria, and was one of the last to come from its once famous school, which became extinct after the capture of the city by Omar in 640. At the end of the 13th century Nicolaus Myrepsus, living at the court in Nicaea, made a collection of prescriptions which was extensively used.

In the time of Emperor Andronicus III (1328-42) lived a highly gifted physician, Joannes Actuarius.

ARABIAN MEDICINE

Arabian medical science forms an important chapter in the history of the development of medicine, not because it was especially productive but because it preserved Greek medical science with that of its most important representative Galen. It was, however, strongly influenced by oriental elements of later times. The adherents of the heretic Nestorius, who in 431 settled in Edessa, were the teachers of the Arabs. After the expulsion these Nestorians settled in Dschondisapor in 489, and there founded a medical school. After the conquest of Persia by the Arabs in 650, Greek culture was held in great esteem, and learned Nestorian, Jewish, and even Indian physicians worked diligently as translators of the Greek writings. In Arabian Spain conditions similarly developed from the 7th century.

Among important physicians in the first period of Greek-Arabic medicine.

That was the period of dependence and of translations. First came the Nestorian family Bachtischua of Syria, which flourished until the 11th century.

Abu Zakerijja Jahja ben Maseweih (d. 875), known as Joannes Damascenus, Mesue the Elder, a Christian who was a director of the hospital at Bagdad, did independent work, and supervised the translation of Greek authors Alkindus (813-73), who wrote a work about compound drugs.

The Nestorian Joannitius (809-about 873), a teacher in Baghdad translated Hippocrates and Dioscurides, and whose work "Isagoge in artem parvam Galeni", early translated into Latin, was much read in the Middle Ages. Wide activity and independent observation – based, however, wholly upon the doctrine of Galen – were shown by Rhazes (c. 850-923), whose chief work, however, "Continens" is a rather unsystematic compilation. In the Middle Ages his "Liber medicinalis Almansoris" was well known and had many commentators. The most valuable of the thirty-six productions of Rhazes which have come down to us is "De variolis et morbillis", a book based upon personal experience.

We ought to mention the dietetic writer Isaac Judaeus (830-about 932), an Egyptian Jew; the Persian, Ali Abbas (d. 994) author of " Pantegnum".

Abu el-Dshezzar (d. 1009) wrote about the causes of the plague in Egypt. A work on pharmaceutics was written by the physician in ordinary to the Spanish Caliph Hisham II (976-1013). Of the surgical authors, Abulkasem (about 912-1013) alone deserves mention, and he depends absolutely on Paulus Egineta. While he received scant attention at home, since surgery was little cultivated by the Arabs, his work, written in a clear and perspicuous style, became known in the West through the Latin translation by Gerardus of Cremona (1187), and was extensively used even in later days.

Arabian medicine reached its culmination with the Persian Abu Ali el-Hosein ben Abdallah Ibn Sina (Avicenna, 980-1037), who based his system entirely upon the teaching of Galen and tried in various ways to supplement the latter. His chief work, "El-Kanûn" (Canon Medicinae), written in a brilliant style and treating all branches of medical science.

Soon they supplanted in the West the works of the Greeks. Until the time of the Humanists it served as the most important textbook for physicians, but in Arabian Spain his fame was small.

One of his chief rivals was Avenzoar (1113-62) from the neighbourhood of Seville. His friend, the philosopher and physician Averroës (1126 -98), of Cordova, is regarded as the complement of Avicenna. His book was also popular in the West and bears the title "Kitâbel-Kolijjat" (Colliget).

With the decline of Arabian rule began the decay of medicine. In the Orient this decline began after the capture of Cordova in 1236, decay becoming complete after the loss of Granada in 1492.

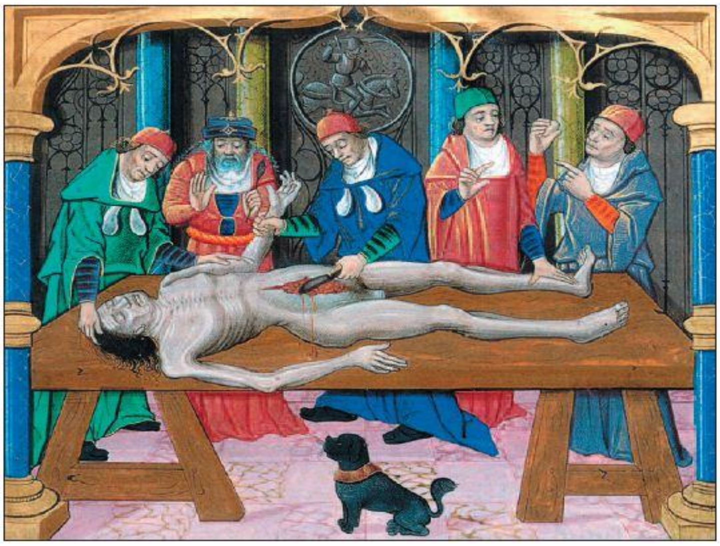
The predominance of Arabian medicine, which lasted scarcely three centuries, seriously delayed the development of our science. A brief survey of this period shows that the Arabs bent in slavish reverence before the works of Aristotle and Galen without examining them critically.

No other Greek physician obtained such a hold on the Arabs as Galen, whose system, perfect in form, pleased them in philosophy. Nowhere did dialectics play a greater part in medicine than among the Arabs and their later followers in the West. Independent investigation in the fields of exact science, anatomy, and physiology was forbidden by the laws of the Koran.

Symptomatology (semiotics) at the bedside, especially prognosis, based on the pulse and the of the urine, were developed by them with an equally exaggerated and fruitless subtlety.

Much, and perhaps the only credit due to them is in the field of pharmaceutics. We are indebted to them for a series of simple and compound drugs of oriental and Indian origin.

Exercise 1. Describe the stages of the development of Arabian medicine.



Avicenna at work

AYURVEDIC MEDICINE

Medicine did, nevertheless, establish itself as a faculty, along with law and theology in the first European Universities from the 12th century. Rogerius Salernitanus composed his *Chirurgia*, laying the foundation for modern Western surgical manuals up to the modern time.

The development of modern neurology began in the 16th century with Vesalius, who described the anatomy of the brain and much else; he had little notion of function, thinking.

Notable Islamic medical pioneers include polymath Avicenna, who, along with Hippocrates, has also been called the Father of Medicine, Abulcasis, the father of surgery, Avenzoar, the father of experimental surgery, Ibn al-Nafis, the father of circulatory physiology, and Averroes. Rhazes, who is called the father of pediatrics, was one of first to question the Greek theory of humorism, which nevertheless remained influential in both medieval Western and medieval Islamic medicine.

During the Crusades, one Muslim observer famously expressed a dim view of contemporary Western medicine. However, overall mortality and mordibity levels in the medieval Middle East and medieval Europe did not significantly differ one from the other, which indicates that there was no major medical "breakthrough" to modern medicine in either region in this period.

The 14th and 15th century Black Death was just as devastating to the Middle East as to Europe, and it has even been argued that Western Europe was generally more effective in recovering from the pandemic than the Middle East. In the early modern period, important early figures in medicine and anatomy emerged in Europe, including Gabriele Falloppio and William Harvey.

In Mehrgarh, Pakistan, archeologists made the discovery that the people of Indus Valley Civilization from the early Harappan periods (c. 3300 B.C.) had knowledge of medicine and dentistry.

The physical anthropologist who carried out the examinations, Professor Andrea Cucina from the University of Missouri-Columbia, made the discovery when he was cleaning the teeth from one of the men. Later research in the same area found evidence of teeth having been drilled, dating back 9,000 years. Ayurveda (the science of living), is the literate, scholarly system of medicine that originated over 2000 years ago in South Asia. Its two most famous texts belong to the schools of Charaka and Suśruta. While these writings display some limited continuities with very ancient medical ideas known from the religious literature called the Vedas, historians have been able to demonstrate direct historical connections between early āyurveda and the early literature of the Buddhists and Jains.

It seems that the earliest foundations of āyurveda were built on a synthesis of selected ancient herbal practices dating back to the early second millennium B.C., together with a massive addition of theoretical conceptualizations, new nosologies and new therapies dating from about 400 B.C. onwards, and coming out of the communities of thinkers who included the Buddha and others.

According to the compendium of Charaka, the Charakasamhitā, health and disease are not predetermined and life may be prolonged by human effort. The compendium of Suśruta, the Suśrutasamhitā defines the purpose of medicine to cure the diseases of the sick, protect the healthy, and to prolong life.

Both these ancient compendia include details of the examination, diagnosis, treatment, and prognosis of numerous ailments. The Suśrutasamhitā is notable for describing procedures on various forms of surgery, including rhinoplasty, the repair of torn ear lobes, perineal lithotomy, cataract surgery, and several other excisions and other surgical procedures.

The āyurvedic classics spoke of eight branches of medicine: internal medicine, surgery including anatomy, eye, ear, nose, and throat diseases, pediatrics, spirit medicine, and toxicology, science of rejuvenation, and aphrodesiacs, mainly for men. Apart from learning these, the student of Āyurveda was expected to know ten arts that were indispensable in the preparation and application of his medicines: distillation, operative skills, cooking, horticulture, metallurgy, sugar manufacture, pharmacy, analysis and separation of minerals, compounding of metals, and preparation of alkalis.

The teaching of various subjects was done during the instruction of relevant clinical subjects.

For example, teaching of anatomy was a part of the teaching of surgery.

Embryology was a part of training in pediatrics and obstetrics, and the knowledge of physiology and pathology was interwoven in the teaching of all the clinical disciplines.

At the closing of the initiation, the guru gave a solemn address to the students where the guru directed the students to a life of chastity, honesty, and vegetarianism.

The student was to strive with all his being for the health of the sick. He was not to betray patients for his own advantage. He was to dress modestly and avoid strong drink.

He was to be collected and self-controlled, measured in speech at all times. He was to constantly improve his knowledge and technical skill. In the home of the patient he was to be courteous and modest, directing all attention to the patient's welfare.

He was not to divulge any knowledge about the patient and his family. If the patient was incurable, he was to keep this to himself if it was likely to harm the patient or others.

The normal length of the student's training appears to have been seven years. Before graduation, the student was to pass a test. But the physician was to continue to learn through texts, direct observation (pratyaksha), and through inference. In addition, the vaidyas attended meetings where knowledge was exchanged. The physicians were also enjoined to gain knowledge of unusual remedies from hillsmen, herdsmen, and forest-dwellers.

Exercise 1. Summarize the information briefly in English.

Exercise 2. Describe the main events in Persian medicine.

The practice and study of medicine in Persia has a long and prolific history. Persia's position at the crossroads of the East and the West frequently placed it in the midst of developments in both ancient Greek and Indian medicine. Many contributions were added to this body of knowledge in both pre- and post-Islamic Iran as well. The first generation of Persian physicians was trained at the Academy of Jundishapur, where the teaching hospital has sometimes been claimed to have been invented. Rhazes, for example, became the first physician to systematically use alcohol in his practice as a physician. The *Comprehensive Book of Medicine* (Large Comprehensive, Hawi, "al-Hawi" or "The Continence") was written by the Iranian chemist Rhazes (Razi), the "Large Comprehensive" was the most sought after of all his compositions. In it, Rhazes recorded clinical cases of his own experience and provided very useful recordings of various diseases. The "*Kitab fi al-jadari wa-al-hasbah*" by Rhazes, with its introduction on measles and smallpox was also very influential in Europe.

The Mutazilite philosopher and physician Avicenna was another influential figure. His *The Canon of Medicine*, sometimes considered the most famous book in the history of medicine, remained a standard text in Europe up until its Age of Enlightenment.

Exercise 3. Translate the words and phrases into Russian drawing up sentences with them.

To take (one's) medicine; to practise medicine; to study medicine; to take a medicine for cold; bad medicine; to prescribe (a) medicine; nonprescription medicine, over-the-counter medicine; patent (proprietary) medicine; strong medicine; mental medicine; forensic medicine; a dose of one's own medicine; legal medicine; prescription medicine; medicine bag, (bottle, chest, dropper, glass, lodge); medicine dance; medicine cabinet; medicine bundle; medicine man.

Exercise 4. Define the major developments of Chinese medicine.

China also developed a large body of traditional medicine. Much of the philosophy of traditional Chinese medicine derived from empirical observations of disease and illness by Taoist physicians and reflects the classical Chinese belief that individual human experiences express causative principles effective in the environment at all scales. These causative principles, whether material, essential, or mystical, correlate as the expression of the natural order of the universe.

The foundational text of Chinese medicine is the Huangdi neijing. Although the *Neijing* has long been attributed to the mythical Yellow Emperor (27^{th} century B.C.), Chinese scholars started doubting this attribution as early as the eleventh century and now usually date the *Neijing* to the late Warring States period (5^{th} century-221 B.C.). Because the medical "silk manuscripts" dating from around 200 B.C. that were excavated in the 1970s from the tomb of a Han-dynasty noble in Mawangdui are undoubtedly ancestors of the received *Neijing*, scholars like Nathan Sivin now argue that the *Neijing* was first compiled in the 1st century B.C.

During the Han dynasty, Zhang Zhongjing, who was mayor of Changsha near the end of the 2^{nd} century A.D., wrote a *Treatise on Cold Damage*, which contains the earliest known reference to the *Neijing Suwen*. The Jin Dynasty practitioner and advocate of acupuncture and moxibustion, Huangfu Mi (215-282 A.D), also quotes the Yellow Emperor in his *Jiayi jing*, ca. 265 A.D.

During the Tang Dynasty, Wang Bing claimed to have located a copy of the originals of the *Suwen*, which he expanded and edited substantially. This work was revisited by an imperial commission during the 11^{th} century A.D., and the result is our best extant representation of the foundational roots of traditional Chinese medicine.

Exercise 5. Transfer the given information from the passages onto a table.

№	**A c t i v i t y**			
	Who	**When**	**Where**	**Score**
1.				

ISLAMIC MEDICINE

The Islamic civilization rose to primacy in medical science as Muslim physicians contributed significantly to the field of medicine, including anatomy, ophthalmology, pharmacology, pharmacy, physiology, surgery, and the pharmaceutical sciences. The Arabs further developed Greek and Roman medical practices. Galen and Hippocrates were pre-eminent authorities.

The translation c.830-870 of 129 works of ancient Greek physician Galen into Arabic by Hunayn ibn Ishaq and his assistants, and in particular Galen's insistence on a rational systematic approach to medicine, set the template for Islamic medicine, which rapidly spread throughout the Arab Empire. Muslim physicians set up some of the earliest dedicated hospitals, which later spread to Europe during the Crusades, inspired by the hospitals in the Middle East.

Al-Kindi wrote *De Gradibus*, in which he demonstrated the application of mathematics to medicine, particularly in the field of pharmacology. This includes the development of a mathematical scale to quantify the strength of drugs, and a system that would allow a doctor to determine in advance the most critical days of a patient's illness. Razi (Rhazes) (865-925) recorded clinical cases of his own experience and provided very useful recordings of various diseases. His *Comprehensive Book of Medicine*, which introduced measles and smallpox, was very influential in Europe. In his *Doubts about Galen*, Razi was also the first to prove the theory of humorism false using an experimental method.

Abulcasis regarded as the father of modern surgery, wrote the *Kitab al-Tasrif* (1000), a 30-volume medical encyclopedia which was taught at Muslim and European medical schools until the 17th century. He used numerous surgical instruments, including the instruments unique to women, as well as the surgical uses of catgut and forceps, the ligature, surgical needle, scalpel, curette, retractor, surgical spoon, sound, surgical hook, surgical rod, and specula, bone saw, and plaster.

Avicenna, considered the father of modern medicine and one of the greatest thinkers and medical scholars in history, wrote *The Canon of Medicine* (1020) and *The Book of Healing* (11th century), which remained standard textbooks in both Muslim and European universities until the 17th century. Avicenna's contributions include

- introduction of systematic experimentation and quantification into the study of physiology;
- discovery of the contagious nature of infectious diseases;
- introduction of quarantine to limit the spread of contagious diseases;
- introduction of experimental medicine and clinical trials;
- the first descriptions on bacteria and viral organisms;
- distinction of mediastinitis from pleurisy;
- contagious nature of phthisis and tuberculosis;
- distribution of diseases by water and soil;
- the first careful descriptions of skin troubles;
- descriptions of sexually transmitted diseases, perversions, nervous ailments;
- use of ice to treat fevers;
- separation of medicine from pharmacology, which was important to the development of the pharmaceutical sciences.

In 1021, Ibn al-Haytham (Alhacen) made important advances in eye surgery and correctly explained the process of sight & visual perception for the first time in his *Book of Optics* (1021).

In 1242, Ibn al-Nafis was the first to describe pulmonary circulation and coronary circulation, which form the basis of the circulatory system, for which he is considered the father of the theory of circulation. He also described the earliest concept of metabolism, and developed new systems of physiology and psychology to replace the Avicennian and Galenic systems, while discrediting many of their erroneous theories on the four humours, pulsation, bones, muscles, intestines, sensory organs, bilious canals, esophagus, stomach, etc.

Ibn al-Lubudi (1210-1267) rejected the theory of four humours, discovered that the body and its preservation depend exclusively upon blood, rejected Galen's idea that women can produce sperm, and discovered that the movement of arteries are not dependent upon the movement of the heart, that the heart is the first organ to form in a fetus' body, and that the bones forming the skull can grow into tumors. Maimonides, although a Jew himself, made various contributions to Islamic medicine in the 13th century. *Anatomy of the body* of Mansur ibn Ilyas (c. 1390) contained comprehensive diagrams of the body's structural, nervous and circulatory systems.

During the Black Death bubonic plague in 14th century al-Andalus, Ibn Khatima and Ibn al-Khatib discovered that infecious diseases are caused by microorganisms which enter the human body.

Other medical innovations by Muslim physicians include the discovery of the immune system, the introduction of microbiology, the use of animal testing, and the combination of medicine with other sciences (including agriculture, botany, chemistry, and pharmacology), as well as the invention of the injection syringe by Ammar ibn Ali al-Mawsili in 9th century Iraq, the first drugstores in Baghdad (754), the distinction between medicine and pharmacy by the 12th century, and the discovery of at least 2,000 medicinal and chemical substances.

Exercise 1. Read the text on Islamic medicine and pick up the essential details.

Exercise 2. Read the passage below and comment in a balanced way on Hebrew medicine.

Most of our knowledge of ancient Hebrew medicine during the 1st millennium BCE comes from the Torah, i.e. the Five Books of Moses, which contain various health related laws and rituals, such as isolating infected people, washing after handling a dead body and burying excrement away from camp. While the observance of these statutes would have and do lead to several health benefits, Jewish belief commands that these rituals and prohibitions be kept purely to fulfill the will of God with no ulterior motive.

Max Neuberger, writing in his "History of Medicine" says "The commands concern prophylaxis and suppression of epidemics, suppression of venereal disease and prostitution, care of the skin, baths, food, housing and clothing, regulation of labor , sexual life , discipline of the people , etc. Many of these commands, such as Sabbath rest, circumcision, laws concerning food (interdiction of blood and pork), measures concerning menstruating and lying-in women and those suffering from gonorrhea, isolation of lepers, and hygiene of the camp, are, in view of the conditions of the climate, surprisingly rational."

Exercise 3. Analyze medieval and early modern European medicine.

"Anatomy Lesson of Dr. Nicolaes Tulp" by Rembrandt van Rijn, 1632. In western Europe the collapse of Roman imperial authority led to a halt to the development of organised medical practice. Medicine became localised, with folk-medicine augmenting what remained of the medical knowledge of antiquity. Medical knowledge was preserved and practised in many monastic institutions, which often had a hospital attached.Organised professional medicine re-emerged, with the foundation of the medical college of Salerno in Italy in the 11th century, which in co-operation with the monastery of Monte Cassino, translated many Byzantine and Arabic works. In the twelfth century universities were founded in Italy and elsewhere, which soon developed schools of medicine.

Gradually the reliance on the masters of the ancient world was augmented by the results of individual observation and experience. Surgical practice improved greatly during the medieval period. Rogerius Salernitanus composed his Chirurgia, laying the foundation for modern Western surgical manuals up to the modern time. With the renaissance came an increase in experimental investigation, principally in dissection and examining bodies. The work of individuals like Andreas Vesalius and William Harvey challenged accepted folklore with scientific evidence. The development of modern neurology began in the 16th century with Vesalius, who described the anatomy of the brain and much else; he had little notion of function, thinking that it lay mainly in the ventricles. Understanding and diagnosis improved but with little direct benefit to health.

CHRISTIANITY'S SHARE IN MEDICAL SCIENCE

As long as the cruel persecution the Church lasted throughout the Roman Empire, it was impossible for Christians to take direct part in the development of medical science.

But provision had been made for medical aid within the community, because the priest, like the rabbi of small Jewish communities in the late Middle Ages, was also a physician.

This is clear from the story of the two brothers, Sts. Cosmas and Damian, who studied medicine in Syria and were martyred under Diocletian. The exercise of practical charity under the direction of deacons of the churches gave rise to systematic nursing and hospitals.

In recent times it has, indeed been alleged that the existence of hospitals among the Buddhists, even in the 3rd century before Christ, and their existence in ancient Mexico at the time of its discovery is demonstrable, and that hospitals had their origin in general philanthropy; but nobody denies that the nursing of the sick, especially during epidemics, had never before been so widespread, so well organized, so self-sacrificing as in the early Christian communities.

Christianity tended the sick and devised and executed extensive schemes for the care of deserted children (foundling, orphans), of the feeble and infirm, of those out of work and of pilgrims.

The era of persecution ended, we find large alms-houses and hospitals like that of St. Basilius in Caesarea (370), those of the Roman Lady Fabiola in Rome and Ostia (400), that of St. Samson adjoining the church of St. Sofia in Constantinople in the sixth century, the foundling asylum of Archbishop Datheus of Milan in 787, and many others.

In 1198 Pope Innocent III rebuilt the pilgrims' shelter, which had been founded in 726 by a British king, but had been repeatedly destroyed by fire. He turned it into a refuge for travellers and a hospital, and entrusted it to the Brothers of the Holy Ghost established by Guy de Montpellier. Mention must also be made here of the religious orders of knights and the houses for lepers of later times.

The great hospitals of the Arabs in Dschondisapor and Bagdad were built after Christian models. The celebrated ecclesiastical writer Tertullian (born A.D. 160) possessed a wide knowledge of medicine, which, following the custom of his time, he calls a "sister of philosophy". Clement of Alexandria, about the middle of the century, lays down valuable hygienic laws in his "Paedagogus".

Lactantius in the fourth century speaks in his work "De Opificio Dei" about the structure of the human body. One of the most learned priests of his time, St. Isidore of Seville (d. 636), treats of medicine in the fourth book of his "Origines S. Etymologiae".

St. Benedict of Nursia (480) made it a duty for the sciences, and among them medicine, as aids to the exercise of hospitality. Cassiodorus gave his monks direct instructions in the study in medicine. Bertharius, Abbot of Monte Cassino in the ninth century, was famous as a physician.

Walafrid Strabo (d. 849), Abbot of Reichenau the oldest medical writer on German soil, describes in a poem (Hortulus) the value of native medicinal plants, and also the method of teaching medicine in monasteries. We must mention, furthermore, the "Physica", a description of drugs from the three kingdoms of nature, written by St. Hildegarde (1099-1179), abbess of a monastery near Bingen-on-the-Rhine. The curative properties of minerals are described by Marbodus of Angers, Bishop of Rennes (d. 1123), in his "Lapidarius".

How diligently medicine was studied in the monasteries is shown by the numerous manuscripts (many still unedited) in the old cathedral libraries and by those which were taken from the suppressed monasteries and are now to be found in the national libraries of various countries. Priests who possessed a knowledge of medicine served as physicians-in-ordinary to princes as late as the fifteenth century, although they were forbidden to practice surgery by the Fourth Synod of the Lateran (1213).

Thus, Master Gerhard, parish priest in Felling, who founded the Hospital of the Holy Ghost at Vienna (1211), was physician-in-ordinary to Duke Leopold VI of Austria, and Sigismund Albicus, who afterward became Archbishop of Prague (1411), held the same office at the court of King Wenzel of Bohemia (1391-1411).

From this time, we constantly meet with priests possessing a knowledge of medicine and writing on medical subjects. The popes, the most important patrons of all the sciences, were friendly also to the development of medicine. That they ever at any time forbade the practice of anatomical investigation is a fable. Pope Boniface VIII in 1299-1300 forbade the practice then prevalent of boiling the corpses of noble persons who had died abroad, in order that their bones might be more conveniently transported to the distant ancestral tomb. This prohibitory rule had reference only to cases of death in Christian countries, while in the Orient (e.g. during the Crusades) the usage seems to have been tacitly allowed to continue.

Exercise 1. Choose the keywords and phrases that best convey the gist of the information.

Exercise 2. Analyze the information, which is in the highlight, and use it in practice.

Important figures

- Oribasius, the greatest Byzantine compiler of medical knowledge.
- Theodoric Borgognoni, (1205-1296), one of the most significant surgeons of the medieval period, responsible for introducing and promoting important surgical advances including basic antiseptic practice and the use of anaesthetics.
- Guy de Chauliac, considered to be one of the earliest fathers of modern surgery, after the great Islamic surgeon, El Zahrawi.
- Realdo Colombo, anatomist & surgeon who contributed to understanding of lesser circulation.
- Michael Servetus was the first European to discover the pulmonary circulation of the blood.
- Ambroise Paré suggested using ligatures instead of cauterisation & tested the bezoar stone.
- William Harvey describes blood circulation.
- John Hunter, surgeon.
- Amato Lusitano described venous valves and guessed their function.
- Garcia de Orta first to describe Cholera and other tropical diseases and herbal treatments
- Percivall Pott, surgeon.
- Sir Thomas Browne physician and medical neologist.
- Thomas Sydenham physician and so-called "English Hippocrates."
- Andreas Vesalius Belgian physician, anatomist, "The father of modern medicine"
- Actuarius, the last great Byzantine Physician lived in the early 14^{th} century Constantinople.

Exercise 3. Name first universities in the west.

Having voluntarily undertaken the education of the young in all branches of learning, the monasteries were aided in their endeavours by both Church and State. The foundation of state schools is the work of Charlemagne (768-814), whose activity, especially in the Germanic countries, was stimulated by the decree of the Synod of Aachen (789), that each monastery and each cathedral chapter should institute a school. According to the Capitulary of Charlemagne at Diedenhofen (Thionville) in 806, medicine was commonly taught in these schools. At the diocesan school in Reims, we find Gerbert d'Aurillac, later Pope Sylvester II (999-1003), long active as a teacher of medicine. Simultaneously with the rise of the cities there sprang up higher municipal schools, as for instance the *Burgerschule* at St. Stephan's in Vienna (about 1237). Out of the secular and religious schools, the curriculum of which institutions comprised the entire learning of the times, the first universities developed themselves partly under imperial and papal protection, according as they sprang from the lay and the cathedral or monastic schools.

Exercise 4. Answer the questions.

1. What was the oldest medical school of the West? 2. Who was one of its oldest physicians? 3. What book was a model for later works of this kind? 4. Who and when established the University of Naples? 5. How was this school ruled? 6. What influence makes itself felt in therapeutics? 7. How did the first universities develop? 8. Where did they spring?

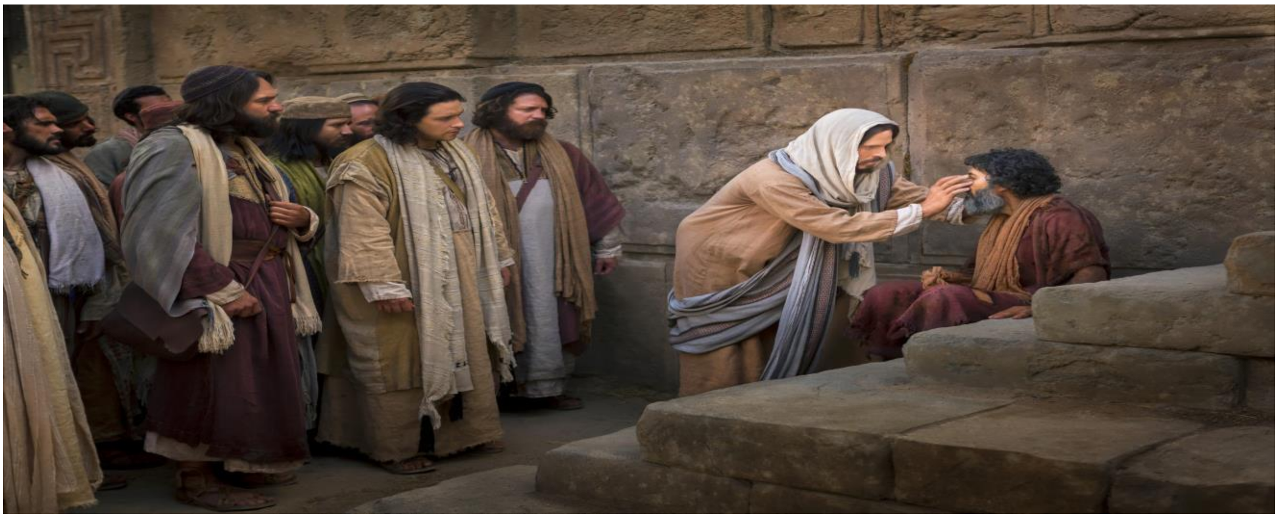
__Exercise 5. Describe Spain as the transmitter of Arabian medicine__.

Its focus was the city of Toledo, which was taken from the Moors in 1085 by Alfonso VI of Castile and Leon. Here Archbishop Raimund (1130-50) founded an institution for translations, in which Jewish scholars were the chief workers. Here 6.lived Gerard of Cremona (1114-87, properly Carmona, near Seville), the translator of Rhazes and Avicenna. A later translator of Rhases (about 1279) was the Jew Faradsch ben Salem (Faragius), who was educated at Salerno.

Exercise 6. Write out all words and phrases according to the topic.







SCHOOL OF SALERNO

This is regarded as the oldest medical school of the West. Salerno on the Tyrrhenian Sea, originally probably a Doric colony, was from the sixth to the eleventh century under the rule of the Lombards, and from 1075 to 1130 under that of the Normans. In 1130 it became a part of the Kingdom of Naples and Sicily. The origin of the school is obscure, but, contrary to former belief, it was not a religious foundation, though very many priests were engaged there as teachers of medicine.

Women and even Jews were admitted to these studies. Salerno was destined to cultivate for a long time Greek medical science in undimmed purity, until the 12th century saw the school fall a victim to the all-powerful Arab influence. One of its oldest physicians was Alpuhans, later (1058-85) Archbishop of Salerno. With him worked the Lombard Gariopontus (d. 1050), whose "Passionarius" is based upon Hippocrates, Galen, and Caelius Aurelianus.

Contemporary with him was the female physician Trotula who worked also in the literary field, and who is said to have been the wife of the physician Joannes Platearius. Perhaps the best known literary work of this school is the anonymous "Regimen sanitatis Salernitanum" a didactic poem consisting of 364 stanzas, which has been translated into all modern languages. It is said to have been dedicated to Prince Robert, son of William the Conqueror, upon his departure from S. Salerno in 1101.

An important change in the intellectual tendency of the "Civitas Hippocratica", as this school called itself, was brought about by the physician Constantine of Carthage (Constantinus Africanus), a man learned in the Oriental languages and a teacher of medicine at Salerno, who died in 1087 a monk of Monte Cassino. While hitherto the best works of Greek antiquity had been known only in mediocre Latin translations, Constantine in the solitude of Monte Cassino began to translate from the Arabic, Greek authors (the "Aphorisms" of Hippocrates and the "Ars parva" of Galen), as well as such Arabic writer as were accessible to him (Isaak, Ali Abbas).

As he brought to the knowledge of his contemporaries first-class Greek authors, but only secondary Arab writers, the study of the former became more profound. On the other hand an interest was awakened in the hitherto unknown Arabic literature. His pupils were Bartholomaeus, whose "Practica" was translated into German as early as the thirteenth century, and Johannes Afflacius.

To the 12th century, when Arabian polypharmacy was introduced, belong Nicolaus Praepositus (about 1140), whose "Antidotarium", a collection of compounded pharmaceutical formulae, became a model for later works of this kind, and Matthaeus Platearius, who, towards the end of the century, wrote a commentary on the above-named "Antidotarium" (Glossae) and a work about simple drugs (Circa instans). Similar productions appeared from the hand of an otherwise unknown *Magister Solernitanus*. Maurus, following Arabian sources, wrote on uroscopy.

Here must be mentioned Petrus Musandinus, the teacher of Pierre Giles of Corbeil, who later became a canon and the physician-in-ordinary to Philip Augustus of France (1180-1223), and who even at this day began to complain about the decay of the school. Its first misfortune dates from the death of King Roger III (1193), when the army of King Henry VI captured the city.

The establishment of the University of Naples by Frederick II in 1224, the preponderance of Arabian influence, and the rise of the Montpellier school, all exerted so unfavourable an influence that by the fourteenth century Salerno was well-nigh forgotten. Salerno is the oldest school having a curriculum prescribed by the state. In 1140 King Roger II ordered a state examination to test the proficiency of prospective physicians, and Frederick II in 1240 prescribed five years of study besides a year of practical experience. When we consider the proximity of Northern Africa, that the neighbouring Sicily had been under Saracenic rule from the 9th to the 11th century, and that the Norman kings, and to a far greater degree Frederick II, gave powerful protection to Arabian art and science, it seems wonderful that this oasis of Graeco-Roman culture endured so long.

Down to the 12th century this school was ruled by a purely Hippocratic spirit, especially in practical medicine, by its diagnosis and by the treatment of acute diseases dietetically.

Arabian influence makes itself felt first of all in therapeutics, a fact which is easily explained by the proximity of Amalfi, where the Arabian drug-dealers used to land. Local conditions (resulting from the Crusades) explain how surgery, especially the treatment of wounds received in war, was diligently cultivated. In Rogerius we find a Salernitan surgeon armed with independent experience, but showing, nevertheless, reminiscences of Abulhasem. His "Practica Chirurgiae" dates from the year 1180. Although Salerno finally succumbed to Arabian influences, this school did not hand down to us a knowledge of the best Arabian authors.

Exercise 1. Give the main traits of School of Salerno.

Exercise 2. Characterize the Scholastic period.

When in the 12th century all the Aristotelean works gradually became known, one of the results was the development of Scholasticism, that logically arranged systematic treatment and explanation of rational truths based upon the Aristotelean speculative method. Even though this tendency led to the growth of many excrescences in medicine and confirmed the predominance of Galen's system, also largely based on speculation. It is wrong to hold Scholasticism responsible for the mistakes which its disciples made in consequence of their faulty apprehension of the system, because Scholasticism, far from excluding the observation of nature, directly promotes it.

The best proof of this is the fact that the most important scholastic of the 13 th century, St. Albertus Magnus, was likewise the most important physicist of his time. He thus imitated his model, Aristotle, in both directions. The famous scholastic Roger Bacon (1214-94), an English Franciscan, lays chief stress his theory of cognition upon experience as far as the natural sciences are concerned, and this with even greater emphasis than Albertus Magnus.

Exercise 3. Describe Albertus Magnus's life and work.

Albertus Magnus (1193-1280) was a Dominican. For medical science his works about animals, plants, and minerals alone concern us. Formerly a work called "De secretis mulierum" was wrongly attributed to him. Albertus's most eminent service to medicine was in pointing out the way to an independent observation of nature. In the medical schools the influence of scholasticism made itself felt, but this influence was always favourable.

The scholastic physician, the philosopher at the bedside, with his compendious works of needy contents, with his endless game of question and answer, must not, however, be misjudged; he preserved interest in the observation of nature and was, as is freely conceded, a skilful practitioner, although he laid excessive stress upon formalism, and medicine in his hands made no special progress.

Exercise 4. Read the passage on Bologna as home of scholastic medicine.

Bologna was the principal home of scholastic medicine, and, as early as the 12th century, a medical school existed there. The most famous physician there was Thaddeus Alderotti (Th. Florentinus,1215-95), who even at that time gave practical clinical instruction and enjoyed great fame as a physician.

Among his pupils were the four Varignana, Dino and Tommaso di Garbo, and Pietro Torrigiano Rustichelli – later a Carthusian monk – all well-known expounders of the writings of Galen. Indirect disciples were Pietro de Tussignana (d. 1410), who first described the baths at Bormio, and Bavarius de Bavariis (d. c. 1480) who was for a long time physician to Pope Nicholas V.

Bologna has stained incomparable glory from the fact that Mondino de Liucci (c. 1275-1326), the reviver of anatomy, taught there. There, for the first time since the Alexandrian period (c.1500), he dissected a human corpse, and wrote a treatise on anatomy based upon personal observation – a work which, for nearly two and a half centuries, remained the official textbook of the universities.

Although Mondino's work which appeared in 1316, contains many defects and errors, if nevertheless marked an advance and incited men to further investigation.

Exercise 5. Add some in formation and make up a small report and give a talk in class.

Exercise 6. Complete the sentences with the facts from the article above.

1. Surgery exhibited during this period in many ______. 2. The founder of the school there was ______. 3. A more important figure was ______. 4. In his book, completed in 1266, he recommends the simplification of ______. 5. Guilielmo Saliceto from Piacenza completed his surgery in ______. 6. He shows great individuality and a kneen diagnostic ______. 7. Lanfranchi strongly recommended the reunion of surgery and internal ______. 8. Lanfranchi, banished in 1290 from his native city, Milan, transplanted Italian surgery to ______. 9. The first important French surgeon is ______. 10. The culminating point in French surgery at this period is marked by ______. 11. He completed his studies at ______. 12. Among contemporary surgeons in other civilized countries we must mention ______. 13. There were a number of itinerant practitioners who offered their services at ______. 14. Down to ______this school was ruled by a purely Hippocratic spirit. 15. The treatment of wounds received ______ was diligently cultivated.

Exercise 7. Read the article on Padua University and give the main idea of it.

Padua, the famous rival of Bologna, received a university in 1222 from Frederick II. Just as the University of Leipzig originated in consequence of the migration of students and professors from the University of Prague in 1409, so Padua came into existence through a secession from Bologna.

Bologna was soon surpassed by the daughter institution, and, from the foundation of the University of Vienna in 1365 until the middle of the 18th century, Padua remained a shining model for the medical school of Bologna. The first teacher of repute was Pietro d' Abano (Petrus Aponensis, 1250 to c. 1320), known as the "great Lombard" – an honorary title received during his residence at the Universlty of Paris. On account of his too liberalistic opinions and his derision of Christian teaching in his "Conciliator differentiarum", his chief medical work, he was accused of being a heretic.

From this period date the "Aggregator Brixiensis" of Guglielmo Corvi (1250-1326), a work in even greater demand in later times, and the "Consilia" of Gentile da Foligno (d. 1348), who, in 1341, performed the first anatomical dissection in Padua.

The fame of the school of Padua was greatly advanced by the family of physicians, the Santa Sophia, which about 1292 emigrated from Constantinople, and whose most famous members were Marsilio (d. 1405) and Galeazzo (d. 1427). The latter, one of the first teachers in Vienna (c.1398-1407), and later professor at Padua, wrote in Vienna a pharmacopoeia which indicates absolutely independent observation in the field of botany. His antithesis and contemporary was Giacomo dalla Torre of Forli (Jacobus Foroliviensis, d. 1413), professor at Padua, known for his commentary on the "Ars parva" of Galen. Giacomo de Dondi (1298-1359), author of the "Aggregator Paduanus do medicinis simplicibus", tried to disengage a salt from the thermal waters of Abano, near Padua.

As anatomist and practitioner we must mention Bartholomaeus de Montagnana (d.1460), and the grandfather of the unfortunate Savonarola, Giovanni Michele Savonarola (1390-1462), author of the "Practica Major", who worked along the same lines.

Exercise 8. Read the article on surgery in the age of Scholasticism and try to understand it.

Surgery exhibited during this period in many respects a more independent development than practical medicine, especially in Bologna. The founder of the school there was Hugo Borgognoni of Lucca (d. about 1258). A more important figure was his son Teodorico, chaplain, penitentiary, and physician-in-ordinary to Pope Innocent IV, later Bishop of Cervia. In his "Surgery", completed in 1266, he recommends the simplification of the treatment of wounds, fractures, and dislocations.

Guilielmo Saliceto from Piacenza, first of Bologna, then at Verona, where he completed his surgery in 1275, shows great individuality and a kneen diagnostic eye. Similarly his pupil Lanfranchi strongly recommended the reunion of surgery and internal medicine. Lanfranchi, banished in 1290 from his native city, Milan, transplanted Italian surgery to Paris. There the surgeons, like the physicians of the faculty, had, since 1260, been formed into a corporation, the College de St. Cosme (since 1713 Academie de Chirurgie), to which Lanfranchi was admitted.

His "Chirurgia magna" finished in 1296, is full of casuistic notes and shows us the author as an equally careful and lucky operator. The first important French surgeon is Henri de Mondeville (1260-1320), originally a teacher of anatomy at Montpellier whose treatise, although for the most part a compilation, does not lack originality and perspicuity. The culminating point in French surgery at this period is marked by the appearance of Guy de Chauliac (Chaulhac, d. about 1370). He completed his studies at Bologna, Montpellier, and Paris; later he entered the ecclesiastical state (1358), and was physician-in-ordinary to popes Clement VI, Innocent VI, and Urban V. From him we have a description of the terrible plague which he witnessed in 1348 at Avignon.

His "Chirurgia magna" treated the subject with a completeness never previously attained, and gave its author during the following centuries the rank of a first-class authority. Among contemporary surgeons in other civilized countries we must mention John Ardern, an Englishman, who studied at Montpellier and lived subsequently in London, famous for his skill in operating for anal fistul, and Jehan Yperman of the Netherlands, who studied in Paris under Lanfranchi.

Besides these surgeons where is no doubt that there were then in Italy many a number of itinerant practitioners who offered their services at fairs; as, specializing usually in certain operations, they often possessed great skill, and their advice and assistence of a wrong tendency in medicine, but they sought by people of the upper classes.

Guilielmo Saliceto

Henry VIII whenry VIIIith the Barber-Surgeons

THE EPOCH OF HUMANISM

A short of the survey of the scholastic period gives us the following picture: On the appearance of Arabic literature in Latin translations, Hippocratic medicine was driven from its last stronghold, Salerno. Then came the rule of Arabism, of the system of Galen in Arabic form equipped with all sorts of sophistic subtleties. The works of Rhazes and Avicenna possessed the greatest authority.

The latter's "Canon", written in clear language and covering the entire field of medicine became the gospel of physicians. The literature of these times is rich in writings but very poor in thought; for people were content when the long-winded commentaries gave them a better understanding of the Arabs.A good many things were incomprehensible, first of all the names of diseases and drugs, which translators rendered incorrectly. A comparative investigation of the Greek authors was practically impossible, as both their works and a knowledge of the Greek language had disappeared from among the Romance nations. Thus it happened that special books had to be written from which were learned foreign words and their meanings. Woe to the physician who dared to doubt the authority of the Arabs! Only men of strong mind could successfully carry out such a dangerous undertaking.

The influence of scholasticism in medicine was manifold. It encouraged the observation of nature at the bedside and logical thinking, but it also stimulated the love of disputation, wherein the main object was to force a possibly independent idea into the strait-jacket of the ruling system, and thus avoid all imputation of medical heresy. Signs of improvement are noticed first in anatomy (Mondino) and subsequently in surgery, which is based upon it.

The impulse to follow a new path came, however from without, first of all from a study of the Greek language, and then directly through the famous poet Francesco Petrarca (1304-74), the zealous patron of humanistic studies and thus of the Renaissance. Petrarch's instructor in the Greek language was the monk Barlaam, who procured for his pupil, Leontius Pilatus, a position as public teacher of the language in Florence in 1350. In later times, especially after the fall of Constantinople in 1453, numerous Greek scholars came to Italy.

With the spread of knowledge of Greek and the enthusiasm for the Hellenic masterpieces in art and science, there arose also an interest in classical Latin. A diligent search for manuscripts of Graeco-Roman antiquity, and efforts along these lines were energetically supported by the popes.

The West now became acquainted with the works of the old Greek pre-Aristotelean philosophers and physicians in their original tongue, a fact which marks the beginning of the fall of the Arabian teaching. Petrarch fought as champion along the whole line of battle, especially against scholasticism and the medicine of that period. There is no doubt that his zeal was exaggerated in many respects.

He blames the physicians of his time because they philosophize and do not cure. Medicine, he says is a practical art and, therefore, may not be treated according to the same methods for the investigation of truth as philosophy. The greatest misfortune had been the appearance of Arabism with all its superstitions (astrology, alchemy, uroscopy). On the other hand, he speaks with great respect of surgery; the reason for this is patent, since he was a friend of the most important surgeon of his time, Guy de Chauliac. There is no doubt that there were then in Italy many excellent physicians who, like Petrarch, recognized the existence of a wrong tendency in medicine, but they were far too weak to break the fetters of Arabism. But a complete change of view did not occur until the 16th century.

Exercise 1. Define signs of improvement: Humanism.

Exercise 2. Transfer the given information from the passages onto a table.

№	Activity			
	Who	When	Where	Score
1.				

Exercise 3. Explain the title of the article "The Black Death of the 14th century".

Associated with the name of Petrarch is the memory of the most terrible epidemic of historic times. The Black Death (bubonic plague with pulmonary infection), originating in Eastern Asia, passed through India to Asia Minor, Arabia, Egypt, Northern Africa, and directly to Europe by the Black Sea.

In Europe the epidemic began in 1346, and spread first of all in the maritime cities of Italy (especially Genoa) and Sicily, in 1347 it appeared in Constantinople, Cyprus, Greece, Malta, Sardinia and Corsica, and, towards the end of the year, at Marseilles; in 1348 in Spain, Southern France (Avignon), Paris, the Netherlands, Italy, Southern England and London, Scbleswig-Holstein and Norway, and in December, in Dalmatia and Jutland; in 1349 in the Austrian Alpine countries, Vienna, and Poland; in 1350 in Russia, where in 1353 the last traces disappeared on the shores of the Black Sea. The entire period was preceded by peculiar natural phenomena, as floods, tidal waves, and abnormally damp weather.

Petrarch, who witnessed the plague at Florence, declared that posterity would regard the description of all its horrors as fables. The loss of human life in Europe, the population of which is estimated to have been 100 millions, is said to have amounted to twenty-five millions.

The disease usually began suddenly and death occurred within three days, and often after a few hours. Physicians were quite powerless in face of the enormous extent of the pestilence. Great self-sacrifice was shown by the clergy, especially by the Franciscans, who are said to have lost 100,000 members through the epidemic. Less voluminous accounts are to be found in the chronicles of the different countries. Europe has since been repeatedly visited by the plague, which has, however, never been so violent nor extended so widely. The last great epidemics occurred in Central Europe in 1679 and 1713.

Exercise 4. Humanism and medical science in the 15th and 16th centuries.

The terrors of the Black Death, and the conviction which it brought of the powerlessness of current medicine, undoubtedly helped to effect a gradual change. The greatest influence, however, was exerted by the humanistic tendency which had found many adherents, especially among physicians. The desire after general cultivation in the natural sciences was substantially promoted by the great voyages of discovery made towards the end of the 15th century.

It is worthy mentioning that, at a time when the gifted Christopher Columbus was still ridiculed as a dreamer by the learned, the Florentine astronomer and physician, Toscanelli, and the house-physician of the Franciscan monastery of Santa Maria de Rabida, Garcia Fernandes, both heartily encouraged him and gave him material aid.

The scientific endeavours for the reform of medicine are characterized by the activity of the translators, by the critical treatment and explanation of old authors, and by independent investigation especially in the field of botany. Concerning translations, those which had reference to the Hippocratic writings were of prime importance. As investigators of Pliny there are all students of Galen. As may be seen, the system of Galen still formed the central point of medical studies.

But it must be regarded as an advance that people now read his works in the original or in accurate translations, not as before in their Arabic form, for in this way many changes and conflicting views introduced by the Arabs were detected. But the full beauty of the Hippocratic works could not be appreciated as long as Galen reigned supreme. The first fruit of Humanism in medicine was primarily of a purely formal nature, the main stress being now laid upon philological subtleties and elegant diction. No longer content with prose, authors often recorded their thoughts in verse. Petrarch had blamed the physicians of his time because they knew how to construct syllogisms, but did not know how to cure; and now the place of the philosophizing practitioners was taken by the poet physicians.

A more satisfactory sign of the times is the great number of medical botanists whose works show more or less independent investigation, and always regard the needs of the physician at the bedside. The most important, however, is the Zurich physician Conrad Gesner (1516-65), who was the first to experiment with tobacco brought from America.

THE HISTORY OF MEDICAL IDEAS

The Making of Modern Medicine explores the history of medical ideas and how practitioners made breakthroughs in understanding how the body worked, about the causes of disease, and how they discovered new treatments. William Harvey's experiments led him to realise that the blood was not used up by the organs, but continually circulated through the veins and arteries.

Joseph Lister's efforts to kill the germs which caused wound infection led to the development of antiseptic and aseptic surgery. But until the 20th century, very few medical men were full-time researchers. The vast majority were also working practitioners, dependent on the fees they received from their patients. Their great moments of discovery were only a tiny part of their working lives – so what did they do in the rest of the time?

Until the 19th century, it was generally accepted that health depended on a balance of the body fluids, and that an imbalance of the humours produced disease. The experts in interpreting the internal state of the body were the physicians. Educated in universities in the theory of medicine, physicians diagnosed by analysing the patient's pulse, observing their general appearance and mood, and the quantity and quality of their evacuations (especially the urine). To treat the conditions, they would prescribe a course of drugs and a regimen of diet, rest or exercise.

Of course, there were no mass-produced pharmaceuticals at this time. The medicines prescribed by the physician would be made up by an apothecary. Trained through an apprenticeship of up to seven years, the apothecary knew the properties of a wide range of medicinal substances taken from plants, minerals and animals (for example, crab's eyes). He also understood to combine them into a wide range of medicines – from purges to remove humours to soothing syrups to stop a cough.

Complaints that affected the surface of the body – skin diseases, boils and wounds – were the province of the surgeon. Also trained by apprenticeship, the surgeon had highly developed manual skills. He could set bones, apply plasters and ointments, remove cysts and perform bloodletting to remove corrupt humours. This is one of many images of surgeons at work among their lower class clientele. Here the surgeon applies a dressing, surrounded by his instruments. In theory, then, the practice of medicine was neatly divided between three groups.

Patients would call on a physician to diagnose their complaint, employ a surgeon to let blood and an apothecary to make up medicines. In fact, only the very rich could afford to consult the whole panoply of practitioners. The poorer would go direct to an apothecary and buy some medicine, or take their rashes and boils to the surgeon for treatment.

In practice, the neat divisions of medicine were rarely observed, and physicians, surgeons and apothecaries competed fiercely among themselves and with the other groups for patients' fees. In the 17th and 18th centuries physicians (the best educated, worked among the highest social classes) constantly complained that apothecaries were taking over their job by diagnosing and prescribing for patients who came to their shops. Surgeons too were muscling onto the physician's well-paid territory, by prescribing drugs to help treat cancers or skin disease.

And patients helped to blur the divisions of practice: no one wanted to pay over the odds for medical care, so rich and poor would go to whichever practitioner could help them for the least outlay.

And to the disgust of all classes of practitioner, this included buying remedies from untrained "quacks". Around 1790, there was a massive shift in medical theory. The idea that health was governed by humours was replaced by the theory that disease affected the body's organs and tissues.

At the same time, the organisation of medical practice also went through a fundamental change: the three-way division into physicians, surgeons and apothecaries was replaced by the familiar two-tier hierarchy of consultant and general practitioner. Unlike the "big bang" which transformed medical theory, the change in medical practice occurred gradually, and was driven by economics. By the 18th century there was fierce competition between practitioners for patients and their fees. Physicians competed with surgeons and apothecaries, they complained of unfair competition from untrained quacks.

As one historian of medicine put it, it was as if medicine was a ladder, with every practitioner shouting "quack" at those standing on the rungs below.

Untrained quacks often presented themselves as if they were trained practitioners. In this engraving, William Salmon claims to be a professor, but actually had no formal qualifications.

In this situation, every practitioner sought the knowledge that would best equip him to attract the maximum number of patients. As disease was seen to be located in organs, which could be detected with new diagnostic aids like the stethoscope, students training to be physicians began to study anatomy. As surgeons devised operations to deal with internal complaints, like cancers, they needed to understand the workings of the body. And practitioners setting up in the growing towns, aiming to earn their fees from the expanding middle class, realised if they could make up drugs they could keep the fees that would have gone to the apothecary.

Thus was born the general practitioner, the medical jack of all trades, able to deal with any type of medical complaint. However, there were always a few difficult cases, requiring highly specialist knowledge to arrive at a successful diagnosis and treatment. These patients were passed to practitioners working in hospitals, the consultants, who continued to specialise in medicine or surgery.

The re-organisation of medical practice did not bring an end to competition. Consultants fought for the most prestigious posts in hospitals and medical schools. General practitioners worked hard to build up their practice at the expense of rivals, satisfying patients not only by their medical skills, but by a soothing bedside manner, and generous donation of time to medical charities to treat the poor.

All practitioners were anxious to maintain the status of medicine as a skilled (and well-paid) profession. No wonder they were anxious to keep nurses in their place. Nurses were expected to carry out the doctor's instructions: to give medicine, not prescribe it.

Much of their work was confined to domestic tasks – keeping the sickroom or ward clean and fresh. Nurses were often photographed with children, affirming their status as carers.

Male practitioners' concern with status also explains the hostility of many doctors to female practitioners – if women were incapable of study, yet could obtain medical qualifications, then the public might start to believe that medicine was not a highly skilled occupation after all!

The services of women doctors were rejected by the British army, but the Scottish Women's Hospitals, which were funded by charitable donations, went on to work in France and Serbia. Staffed entirely by women, they treated soldiers in France and Serbia, proving the competence of their female surgeons under difficult conditions. The divisions of medical practice created in the 19th century – between general practitioners, consultants and nurses have proved to be very stable. But occupations are not set in stone. We may be at the beginning of another period of upheaval, with economic pressure for general practitioners to carry out simple surgery and for specialist clinics to be based in health centres. Practice nurses have taken on some of the routine aspects of the general practitioners' work. Perhaps the boundaries are about to change again.

Exercise 1. Characterize the studies at Montpellier.

The earliest information about the medical school of this place dates from the 12^{th} century.

Like Salerno, Montpellier developed great independence as far as the other schools were concerned, and laid the greatest stress upon practical medicine. With the decay of Salerno, Montpellier gained in importance. The chief representative of this school is the Spaniards, Arnold of Villanova (1235-about 1312). His greatest merit is that, inclining more towards the Hippocratic school, he did not follow unconditionally the teachings of Galen and Avicenna, but relied upon his own observation and experience, while employing in therapeutics a more dietetic treatment as opposed to Arabian tenets. To him we are indebted for the systematic use of alcohol in certain diseases.

A very doubtful merit is his popularizing of alchemy to the study of which he was very much devoted. The medical school of Paris, founded in 1180, remained far behind Montpellier in regard to the practice of medicine.

ANATOMY AS A MEDICAL SCIENCE

From the time of Mondino, anatomy had been diligently cultivated at the universities, especially in Italy. In Bologna, Giovanni de Concoreggi (d. 1438) issued a work on anatomy.

We possess numerous anatomical descriptions and sketches by Leonardo da Vinci (1442-1519) which were intended partly for all anatomy planned by Marcantonio della Torre (Turrianus, 1473-1506), and partly for a work of his own.

The great Michelangelo (1475-1564) left sketches of the muscles and in 1495, in the monastery of Santo Spirito at Florence, made studies for a picture of the Crucified with cadavers as models. As an indication of how much the popes endeavoured to advance the study of anatomy we may recall that the priest Gabriel de Zerbis for a time taught anatomy in Rome (towards the end of the 15th century) that Paul III (1534-49) appointed the surgeon Alfonso Ferri to teach this subject at the Sapienza in 1535.

Foremost among the universities stood Padua, the stronghold of medical science whence was to issue the light which disclosed the weakness of Galen's system. In Padua, were performed no less than fourteen dissections, there existed since 1446 an anatomical theatre which in 1490 was rebuilt under Alessandro Benedetti (1460-1525). The great reformer of anatomy was Andreas Vesalius.

Vesalius (b. 1514), studied at Louvain, Montpellier and Paris, then became imperial field-surgeon. His eagerness to learn went so far that he stole corpses from the gallows to work on at night in his room. He soon became convinced of the weakness and falsity of the anatomy of Galen. His anatomical demonstrations on the cadaver, which he performed in several cities and which attracted attention, soon earned him a call to Padua where he had recently graduated and where, with some interruptions, he taught from 1539 to 1546.

His chief work appeared at Basle in 1543, brought him great fame, but likewise aroused violent hostility, especially on the part of his former teacher, Sylvius. The supreme service of Vesalius is that he for the first time, with information derived from the direct study of the dead body, attacked with keen criticism the hitherto unassailable Galen, and thus brought about his overthrow. Vesalius is the founder of scientific anatomy and of the technique of modern dissection. Unfortunately, he himself destroyed a part of his manuscripts on learning that his enemies intended to submit his work to ecclesiastical censure. While engaged on a pilgrimage, he received word in Jerusalem of his reappointment as professor in Padua, but he was shipwrecked in Zant and died there in great need in 1565.

The authority of Galen was, however, still so deep-rooted among physicians that Vesalius found opponents even among his own more intimate pupils. Nevertheless, the path which he had pointed out was further explored and anatomy enriched by new discoveries. In comparison with the excellent productions of Italy, the anatomical activity of Germanic countries appears slight. It was considered sufficient at the universities, if a surgeon now and then dissected a corpse, while a physician explained the functions of different organs. The only laudable exceptions were two physicians who rendered services both to anatomy and botany – Felix Platter (1536-1614), professor in Basle, and his successor, Kaspar Bauhinus (1560-1624), the discoverer of the valve in the *caecum* named after him.

Exercise 1. Analyze the progress in anatomy.

Exercise 2. Digest the score of the information briefly in English.

Exercise 3. Transfer the given information from the passages onto a table.

№	Activity			
	Who	When	Where	Score
1.				

Exercise 4. Name the opponents of Galen and the Arabs.

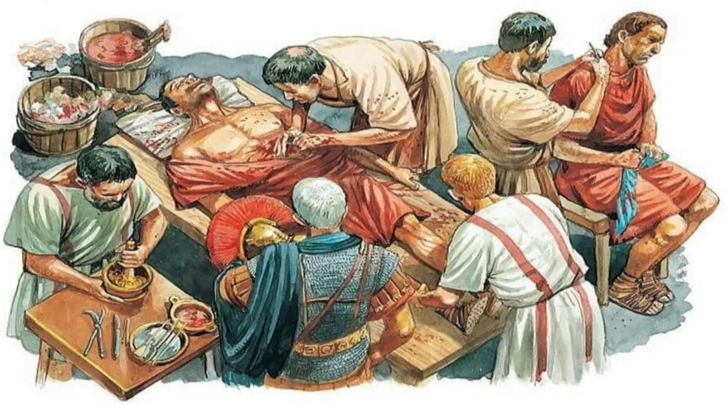
Violent attacks upon ancient traditions were not confined to the domain of medicine, but also found expression in the general upheaval caused by Humanists, by the discovery of new countries, by the opening up new sources of knowledge, by the dissemination of education through the invention of printing, and by the schism of the Church brought about by Luther.

Authority, both ecclesiastical and civil, had been considerably weakened. The investigations of Vesalius probably dealt the most serious blow to the teaching of Galen, but it was neither the first nor the only one; for even before Vesalius' critics had attacked the theories of Galen and the Arabs, although not quite so energetically as the anatomists attacked them.

The chief representatives of these times down to the end of 16th century can be classed respectively into anti-Galenists or anti-Arabists and positive Hippocratics. The climax of this revolution was reached on the appearance of Theophrastus Paracelsus and his adherents although the Italian schools remained uninfluenced by this. The physician and philosopher, Geronimo Cardano of Milan (1501-76), attacked principally Galen's explanation of the origin of catarrhs of the brain, and also the validity of the therapeutical principle, *Contraria contrariis curantur*. Similar was the tendency shown by Bernadino Telesio of Piacenza (1508-88), Giovanni Argenterio of Piedmont (1513-72), and the chancellor of Montpellier, Laurent Joubert (1529-83), while Jean Fernel (1485-1558), made an attempt to modernize the system of Galen in accordance with the results of anatomical investigation.

A lively exchange of opinions was caused by the controversy on bleeding, which was begun by the Paris physician Pierre Brissot (1478-1522). Brissot assailed the Arabian doctrine that inflammatory diseases, especially pleurisy, should be treated by bleeding on the side opposite to the seat of inflammation, and favoured the Hippocratic doctrine of bleeding as near as possible to it.

The controversy was decided in favour of the Hippocratics, who did not discard the doctrines of Galen as long as they agreed with Hippocratic views, but rejected the principles of Galen as modified by the Arabs. This is clearly shown by the importance attached to the state of the pulse and of the urine, upon which the Arabs laid much more stress than the Greeks. Of the great number of positive Hippocratics let us call attention to the above-mentioned de Monte, who introduced clinical instruction in Padua.



THEOPHRASTUS PARACELSUS & HIS ADHERENTS

Theophrastus Bombast of Hohenheim (Paracelsus), the son of a physician, was born near Einsiedeln, Switzerland, in 1493. In 1506 he went to the University of Basle; from Trithemius he learned chemistry and metallurgy in the smelting houses at Schwaz (Tyrol), he visited the principal universities of Italy and France. In 1526 he became town physician of Basle, and could as such give lectures. His first appearance is characteristic of him. He publicly burned the works of Avicenna and Galen and showed respect only to the "Aphorisms" of Hippocrates.

He was the first to give lectures in the German language. But as early as 1528, he was compelled, on account of the hostility he evoked, to leave Basle secretly.

After this he travelled through various countries working constantly at his numerous writings, until death overtook him at Salzburg in 1541. Paracelsus, like a blazing meteor, rose and disappeared; he shared the fate of those who have a violent desire to destroy the old without having any substitute to offer. Passing over his philosophic views, which were based upon neo-Platonism, we find practical medicine indebted to him in various ways, e.g. for the theory of the causes of disease (etiology) for the introduction of chemical therapeutics, and for his insistence on the usefulness of mineral waters and native vegetable drugs. He exaggerates indeed the value of experience.

His classification and diagnosis of diseases are quite unscientific, anatomy and physiology being wholly neglected. He thought that for each disease there should exist a specific remedy, and that to discover this is the chief object of medical art. With him diagnosis hung upon the success of this or that remedy, and because of this he named the diseases according to their specific remedies.

Directly repudiated by the Italian schools, Paracelsus found adherents mainly in Germany, among them being the Wittenberg professor Oswald Croll (about 1560-1609). He also found numerous friends among the travelling physicians and quacks. His teachings met with the most hostile reception from the Paris faculty. Although the further progress of anatomy and physiology indicated clearly to physicians the right path.

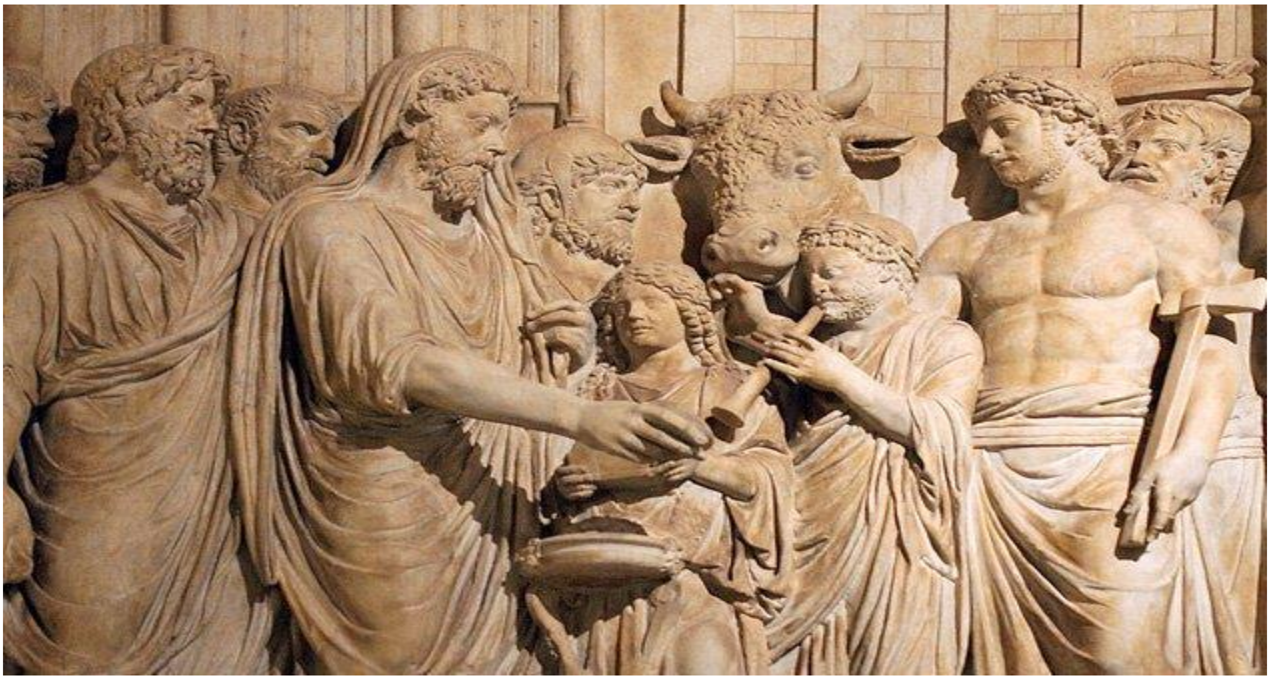
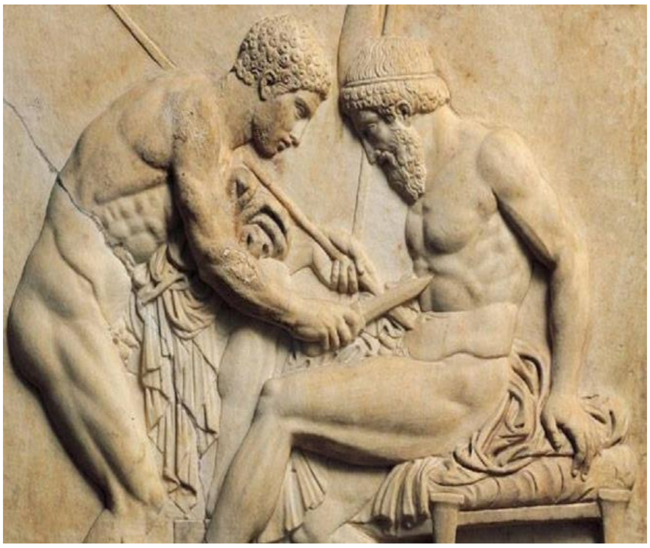
Exercise 1. Explain the traits of surgery in the 16th century.

The first fruits of the progress in anatomy were enjoyed by surgery, especially since most Italian anatomists were practical surgeons. After the introduction of firearms in war, the treatment of gunshot wounds was especially studied. While surgery had always enjoyed a high rank in Italy and France, in Germany it was in the hands of barbers and surgeons unconnected with the universities and poorly educated; hence it is readily understood why the best surgeons lived in the cities nearest the Romance countries, especially Strasburg. We are indebted to the French field-surgeon Ambroise Pare for a marked change in the treatment of gunshot wounds and arterial hemorrhage.

He abandoned the Arabic method of work with a red-hot knife, declared that supposedly poisoned gunshot wounds were simple contused wounds, and proceeded to bandage them without using hot oil. He was the first to employ the ligature in the case of arterial hemorrhage. Next to him in importance stands Pierre Franco (about 1560), known as the perfecter of the operation of lithotomy and that for hernia. Gaspare Tagliacozzi of Bologna (1546-99) deserves credit for reintroducing and improving the ancient plastic operations. In the 16th century the Caesarean operation was performed on living persons.

Exercise 2. Render the activity of Theophrastus Paracelsus – his adherents and opponents.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 3. Define the notions "iatrophysicists" and "iatrochemists".

The doctrine of the circulation is based to a large extent upon the laws of physics. Among a number of physicians, influenced by the works of Alfonso Borelli (1608-78) on animal motion, there was a marked effort to explain all physiological processes according to the laws of physics (iatrophysicists).

Opposed to them was a party, which, influenced by the progress in chemistry, sought to make use of it for explaining medical facts (iatrochemists). This tendency goes back to Paracelsus and his adherent Johann Baptist von Helmont (1578-1644).

Helmont, who was an important chemist (the discoverer of carbonic acid), recognized the importance of anatomy, deserves credit for his work in therapeutics, although his failure to appraise the needs of his time prevented his doctrine from influencing the development of medicine. Iatrophysics was cultivated mainly in Italy & England; iatrochemistry in the Netherlands and Germany.

The chief adherent of iatrophysics in Italy was Giorgio Baglivi (d. 1707), professor at the Sapienza in Rome; in practical medicine, however, he held mainly to Hippocratic principles, while the Englishman, Archibald Pitcairn (1652-1713), tried to follow out iatrophysics to its utmost consequences.

Owing to the greater progress made in physics, iatrochemistry found fewer followers, and that it took root at all is the service of its chief representative Franz Sylvius (1614-72), who in 1658 became professor of practical medicine at Leyden. In 1575, Jan Heurne had already tried to establish a clinic after the Paduan model, but it was not till 1637 that his son Otto was able to carry out his scheme.

The immediate successors of the latter, Albert Kyper (d. 1658), Ewald Schrevelius (1576-1646), continued this institution in the Hippocratic spirit. Before Sylvius began to teach there, the Leyden clinic had already gained worldwide fame. One of the first adherents of Harvey, Sylvius, depending in part on Paracelsus and Belmont sought to explain physiological processes by suggesting fermentation and "vital spirits" as moving forces. This simple doctrine, supported by the clinical activity of Sylvius, found numerous adherents especially in Germany. The two theories are, however, not absolutely opposed to each other, for both physics & chemistry offer the means necessary for an explanation of physiological processes and may form the basis for the construction of an exact medical science.

At this time, however, physics and chemistry (especially the latter) were still too little developed for this purpose. Fortunately, the two parties found a common point of union in practical medicine, where the doctrines of the Hippocratic school were predominant.

Exercise 4. Describe discovery of the circulation of the blood.

Galen's theory, according to which the left heart and the arteries contained air, the blood being generated in the liver, had long been regarded as improbable, but in spite of every effort no one had as yet discovered the truth about circulation. The solution of this problem, which brought about complete fall of Galen's system and a revolution in physiology, came from the English physician William Harvey of Folkstone (1578-1657).

Harvey's discovery published in 1628, that the heart is the centre of the circulation of the blood must return to the heart, at first received scant notice and was even directly opposed by Galen's adherents; but further investigation soon made truth victorious. Even as early as 1622, Gaspare Aselli (1581-1626) found the chyle vessels, but correct explanation was possible only after the discovery of the thoracic duct and its opening into the circulation by Jean Pacquet (1622-74) and Johann van Horne (1621-70), and of the lymphatic vessels by Olaus Rudbeck (1630-1702) & Thomas Baltholinus (1616-80). A new field of investigation was opened by the invention of the microscope, by which Marcello Malpighi (1628-94) discovered the smaller blood-vessels and the blood corpuscles. From Harvey's time starts a series of important anatomists and physiologists.

Exercise 5. Render the main idea of the information.

Exercise 6. Make up some dialogues from the information above.

Exercise 7. Read the information & pick up the essential details in the form of quick notes.

Exercise 8. Name pioneers in practical medicine.

Both renounce all systems and lay most stress upon the perfection of practical medicine.

Thomas Sydenham (1624-89), physician at Westminster and known as the "English Hippocrates", laid down the principle that, just as in the natural sciences so in medicine the inductive method should be authoritative. The main object of medicine, healing, would be possible only when the chances lying at the root of disease and the laws governing its course had been investigated.

Then also would the proper remedies be found. Following the idea of Hippocrates, he seeks the cause of disease in the change of the fundamental humours (humoral pathology).

The activity of the physician was mainly to assist "nature". A man of the same intellectual build as Sydenham was Hermann Boerhave (1668-1738), the most famous practitioner of his time, who in 1720 became clinical professor at Leyden. Being an iatrophysicist, he regards Hippocratism as able to live only if the results of investigation in anatomy, physiology, physics, and chemistry are properly used. He tries to explain most physiological processes as purely mechanical.

In contradistinction to the two professors of Halle, Friedrich Hoffmann (1660-1742) and George Ernst Stahl (1660-1734), of whom former supposed the ether (Leibniz's doctrine of monads) and latter the "soul" to be moving power, Boerhave did not care at all about any moving force that might possibly be present. With his death Leyden lost its importance as a nursery of medicine.

His illustrious pupil and commentator, Gerhard van Swieten (1700-72), was called as teacher to Vienna in 1745, and there laid the foundation of the fame of the school whose most important representatives are Anton de Haen (1704-76) and his successor as teacher, Maximilian Stoll (1742-88). Under the eye of van Swieten and de Haen but without recognition from them, a simple hospital physician, Leopold Auenbrugger (1722-1809), published his epoch-making discovery that, by striking or rapping on the chest (percussion) disease of the lungs and heart may be diagnosed from the various sounds elicited by such percussion. An important member of the Vienna school was Johann Peter Frank (1745-1821), director of the general hospital.

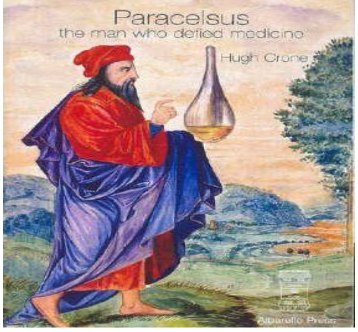
Exercise 9.Trace the development of anatomy in the 18th century.

During this period normal and pathological anatomy were more cultivated than microscopy. The greater number of investigators that we have to consider won fame in the field of surgery.

Abnormal anatomical changes in organs had been recorded since the time of Vesalius, but these were for the most part merely incidental observations and nobody had tried to trace systematically the connection between them and the symptoms occurring in the living body.

The best survey of the achievements of the earlier centuries is offered in Theophil Bonet's "Sepulchretum anatomicum" (1709). As the scientific founder of pathological anatomy we must mention Giovanni Battista Morgagni (1682-1771), professor at Padua, whose famous work, "De sedibus et causis morborum" (1761), usually contains, besides the results of post-mortem examinations, a corresponding history of the diseases. Johann Jakob Wepfer in Schaffhausen (1620-95).

In Vienna, autopsies on those who died in the clinic were first regularly made by Anton de Haen. For a strictly systematic treatment of the whole field we are indebted to the London physician, Matthew Baillie (1761-1823), who published the first pictorial work on pathological anatomy.


Exercise 10. Follow the progress in surgery in the 17th and 18th centuries.

In the 18h century surgery was essentially stimulated by the numerous wars: in France also through the establishment of an academy in 1731 by Georges Mareschal (1658-1736) and François Gigot de la Peyronie (1678-1747). The most eminent and versatile surgeon is the already-mentioned John Hunter (treatment of aneurisms, theory of inflammation, gunshot wounds, syphilis.

Surgery was on a much lower plane in the Germanic countries. For the better training of the Prussian military surgeons and on the proposal of Surgeon-General Ernst Konrad Holtzendorff (1688-1751), there was founded in Berlin a *Collegium medico-chirurgicum* in 1714; later in 1726 the Charite school, and in 1795 the Pepinière academy. Surgery made great progress through Johann Zacharias Platner (1694-1747) at Leipzig; Johann Ulrich Bilguer (1720-96) and Christian Ludwig Mursinna (1744-1833) at Berlin, Karl Kasper Siebold (1736-1807) at Wurzburg, and especially through August Gottlob Richter (1742-1812) at Göttingen (surgical library).

A school for military surgeons was founded at Vienna in 1775 at the suggestion of Anton Störck (1731-1803), ten years after which was established the Josephinum academy under the direction of the army Surgeon-in-chief Johann Alexander von Brambilla (1728-1800).

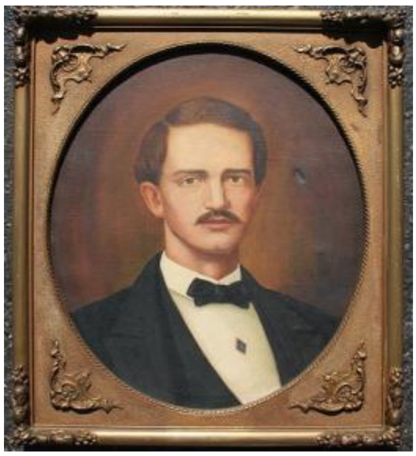
Exercise 11. Transfer the given information from the passages onto a table.

№	Activity			
	Who	When	Where	Score
1.				

Exercise 12. Analyze the information, which is in the highlight, and use it in practice.

François Magendie

François Achille Longet



Johannes Muller

STUDY OF PHYSIOLOGY

The great discoveries in the field of gross and minute (microscopic) anatomy naturally impelled men to investigate the vital functions, but the results of the efforts of both iatrophysicists and iatrochemists were far from satisfactory, since scientific aid was sadly lacking.

Physiology for the first time received systematic treatment at the hands of the versatile scholar, Albrecht von Haller of Bern (1708-77), professor in Gottingen from 1737 to 1753. Haller, a pupil of Albinus and Boerhave, was the first to recognize the importance of experiments on animals. We are indebted to him for the best description of the vascular system and for studies in haemodynamics, in which field, however, the English clergyman, Stephen Hales (d. 1761), had already broken the soil. He correctly recognized the mechanism of respiration without being able to investigate its physiological importance (exchange of gases), since Joseph Priestley did not discover oxygen until 1774.

He disproved the view that there was air between the lungs and the pleura by a simple experiment on animals. Haller became best known through the discovery of irritability and sensibility. When external stimuli are applied to tissues, especially muscles, the latter react either by contracting and moving (irritability), or by experiencing sensation or sense of pain (sensibility) or at times by both.

Sensibility disappears when the corresponding nerve is cut, while irritability persists independent of the nerves and even continues some time after death.

This theory met with great opposition especially among the practical physicians, who did not, however, take the trouble to repeat the experiments on animals. Even though Haller knew neither the central cause of the two phenomena, nor the correct structure of the tissues, it nevertheless stands to his credit that he was the first to point out the facts and open up new roads for physiology.

Haller's investigation was generally welcomed, especially in Italy by Abbate Lazzaro Spallanzani (1729-99), the first scientific opponent of spontaneous generation. His experiments along the lines of artificial fertilization of frogs' eggs, and concerning digestion are famous.

Felice Fontana (1730-1805), repeating the experiments concerning irritability, reached the same results as Haller. William Hewson (1729-74) studied the qualities of the blood (coagulation).

The most important German physiologist after Haller is Kasper Friedrich Wolff (1735-94), known for his investigations in the field of evolution and for pointing out the fact that both animals and plants are composed of the same elements, which he called little "bubbles" or "globules".

Joseph Priestley's discovery of "dephlogisticated air" (1774), as oxygen was then called, was of the highest importance in the development of the theory of respiration, of the process of tissue-decomposition, of formation of the blood, and of metabolic phenomena.

Exercise 1. Answer the questions.

1. What impelled men to investigate also the vital functions? 2. Were the results of the efforts of both iatrophysicists and iatrochemists satisfactory? 3. How did physiology receive systematic treatment? 4. Who was Albrecht von Haller of Bern? 5. What did he done in medicine? 6. What are we indebted to him? 7. What did the English clergyman, Stephen Hales in the field of medicine? 8. When did Joseph Priestley discover oxygen? 9. What did Haller become best known through? 9. Where was Haller's investigation generally welcomed? 10. Who was the first scientific opponent of spontaneous generation? 11. Who was the most important German physiologist after Haller? 12. How were his experiments famous?

Exercise 2. Transfer the given information from the passages onto a table.

№	Activity			
	Who	When	Where	Score
1.				

PROGRESS & PHYSIOLOGY

Physiology is indebted for its perfection to the progress of minute anatomy (doctrine of tissues) to the improved means of investigation (microscope, chemical and physical apparatus), but especially to the fact that experiments on animals (vivisection) were once more extensively made. The principal physiologists of the past century were in France and in Germany.

François Magendie (1783-1855), opposing Bichat (vitalism), maintained that there is no uniform vital energy, and that the vital qualities of the different organs are to be explained upon a physical and chemical basis and by means of experiments. His investigations in haemodynamics and the functions of the nervous system (roots of the spinal column), in which he supplemented the work of Charles Bell (Law of Bell-Magendie) are very important.

Marie Jean Pierre Flourens (1794-1867) is known by his studies in disturbances of co-ordination, nutrition of the bones, and localization of the centre of respiration in the medulla oblongata, and François Achille Longet (1811-71) by his work on the functions of the anterior and posterior columns of the spinal cord, the innervation of the larynx, the nerves of the brain, and the law of the contraction of the muscles.

The most famous French physiologist, a pioneer in the field of physiological chemistry, is Claude Bernard (glycogenic function of the liver, the consumption of glycogen through work of the muscles, the discovery of vascular nerves, the chemistry of the bile and the urine, theory of diabetes mellitus, assimilation of sugar, atrophy of the pancreas, the power of the pancreatic juice to digest albumen, and the theory of animal heat).

The physiology of the circulation was elaborated by Etienne Jules Marey (b. 1830; blood pressure, mechanism of the heart and the invention of the sphygmograph). The relation of muscles and nerves to electricity was studied by Guillaume Benjamin Duchesne (1806-75), awhile Charles Edouard Brown-Sequard (1818-94), the founder of modern organo-therapeutics, investigated the reflex irritability of the spinal cord, the blood, respiration, and animal heat.

In Great Britain were Marshall Hall (1780-1857; theory of reflex action), William Bowman (1816-92, structure of the striated muscles, and theory of the secretion of urine), Alfred Henry Garrod (1846-79; sphygmography physics of the nerves), Augustus Volney Waller (1816-70; diapedesis of the red corpuscles of the blood, studies on nerve-fibres and ganglia, Waller's degeneration) and William Prout (1785-1869; discovery of free hydrochloric acid in the gastric juice).

The Bohemian Johann Evangelist Purkyje (1787-1869) founded at Breslau the first German physiological institute. His most important studies were concerned with the physiology of the organs of sense, especially of sight, the physiology of the muscles and nerves, the ciliary movement of the epithelium of the mucous membrane, the structure of the nerve-fibre (axis-cylinder) of the ganglia, the glands secreting gastric juice, the sympathetic nervous system, and the history of development (discovery of the germinal spot).

The greatest credit for developing modern physiology is due to the school of the versatile Johannes Muller (1801-58). Muller's importance comparable to that of Albrecht von Haller, is due on the one hand to the results of his own investigations (studies on the physiology of the organs of sense, the sympathetic nervous system, the theory of reflex action, the production of voice in the larynx, and the description of the cartilage-nucleus), and on the other hand to his activity in all branches of physiology and in his grasp of the entire field of physiological knowledge.

Exercise 1. Define the notion of "physiology".

Exercise 2. Transfer the given information from the passages onto a table.

№	Who	When	Where	Score
1.				

MEDICAL SYSTEMS IN THE 18TH CENTURY

The three great discoveries in the second half of the century (oxygen, galvanism, and irritability), contrary to what one might expect, led scientists astray, and gave rise to systems whose foundations were of a purely hypothetical nature. Especially interesting are the neuro-pathological theories, connected to some extent with irritability. William Cullen (1712-90) accepting irritability as his starting-point, supposes a "tonus" or fluid inherent in the nerves (Newton's ether), whose stronger or weaker motions produce either a spasm or atony. In addition "weakness" of the brain and "vital power" played a great part in his explanation of diseases.

Cullen's pupil, John Brown (about 1735-88), modified this doctrine by explaining that all living creatures possess excitability, located in the nerves and muscles, which are excited to activity by external and internal influences (stimuli). Diseases occur according to increase or dimunition of the stimuli causing increased excitability; (*sthenia*) and weak stimuli diminished excitability (*asthenia*).

Death is caused either by an increase of excitability with a lack of stimuli, or by exhaustion of excitability from too strong stimuli. Brown's theory was little noticed in England and France, but in Germany it was highly lauded. Christoph Girtanner (1760-1800) & Joseph Frank (1771-1842) spread its fame.

Giovanni Rasori (1762-1837), building also on Brown's theory, developed his contra-stimulistic system, namely that there are influences which directly diminish excitement (contra-stimuli) or remove existing stimuli (indirect contra-stimuli); he, therefore, distinguishes two groups of diseases – diathesis of the stimulus and that of the contra-stimulus. Another group of systematizers, the Vitalists, basing their views upon Stahl's doctrine of the soul (Animism) and Haller's irritability, consider vital energy to be the foundation of all organic processes. The chief representatives of Vitalism, a system developed especially in France and later predominant in Germay.

But, while these physicians adhered to Hippocratism in practice were eminently active in developing anatomy and physiology, the same may not be said of the three Germans, Mesmer, Hahnemann, and Rademacher, who were the last followers of Paracelsus.

The doctrine of animal magnetism, established by Friedrich Anton Mesmer (1734-1815), is connected with Vitalism in so far as Mesmer presupposes a magnetic power to exist in the body, and accordingly tries, at first by means of magnets and later by touching and stroking the body, to effect an interchange of forces, a transfusion or cure.

Mesmer through his manipulations very likely induced real hypnotic sleep in many cases. His doctrine, however, which at first met with a sharp rebuff and was subsequently characterized in many circles as a fraud, was degraded by his immediate followers to somnambulism and clairvoyance, and in later times it became altogether discredited from having fallen into the hands of quacks.

Nevertheless, mesmerism forms a basis for hypnotism, which in 1841 was established by James Braid. Homeopathy, founded by Samuel Friedrich Christian Hahnemann, seems to have the promise of a long lease of life. Hahnemann regards disease as a disturbance of vital energy.

The latter in itself has no power to heal, for a cure can take place only when a similar set of symptoms. The best way to produce such a disease is to give highly diluted drugs which are capable of producing a similar set of symptoms. The rest of this "drug-disease" is destroyed by the vital energy.

It is possible only when the doses are small. As chief principle, therefore, Hahnemann sets up the doctrine that like cures like. Since he denies the possibility of investigating the nature of disease, and completely disregards pathological anatomy, it is necessary to know all simple drugs which produce a set of symptoms similar to those of the existing disease.

With his pupils Hahnemann undertook the task of testing the effects of all simple drugs, but the result of this gigantic piece of work could not be absolutely objective, since it is based upon the purely subjective feeling of the experimentalists. Never before had a physician built a system upon so many purely arbitrary hypotheses as Hahnemann.

Paracelsus also had declared war upon the old medicine, and had attributed little value to anatomical and physiological investigation. That however, was still in its initial period of development; but, with his reverence for Hippocrates, he nevertheless ranks higher than Hahnemann, who is the representative of empiricism and the despiser of all the positive successes which medicine had previously attained.

Hahnemann's more sensible pupils did not follow their master blindly, but regarded his method as that which under the most favourable circumstances it may be, viz., a purely therapeutical method that does not disregard clinical science. To this rational standpoints together with eclecticism, homeopathy he has owed its long life and wide dissemination.

One service of physicians of this school is that they simplified prescriptions, and appreciatively studied obsolete, but nevertheless valuable vegetable drugs. Hahnemann's pupil, Lux, extended homeopathy to isotherapy, which in modern times celebrated its renascence in organotherapy. Widely removed from scientific progess was the "empirical medical doctrine" of Johann Gottfried Rademacher (1772-1850), which is today completely discredited.

Starting from the doctrine of nostrums of Paracelsus, he names the diseases according to the effective drug (e.g. nux-vomica strychina, liver disease), and classifies diseases as universal and organic in accordance with universal and organic drugs. His therapeutics was a purely empirical one, uninfluenced by pathology or clinical diagnosis.

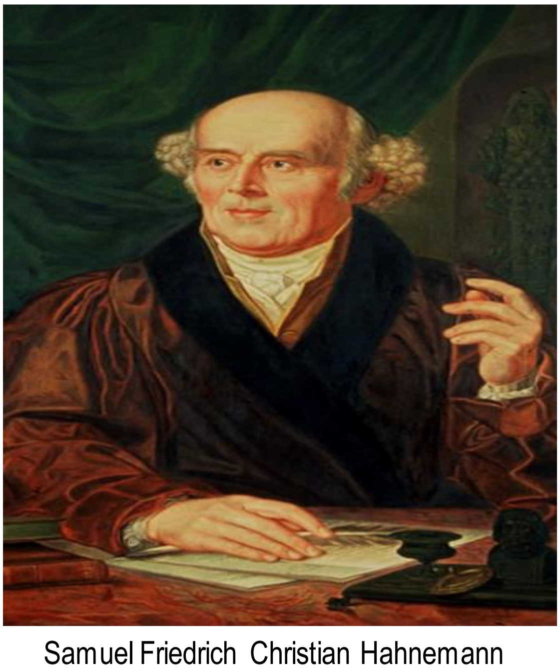
Exercise 1. Analyze the information and use it in practice.

Exercise 2. Make up some dialogues from the information above.

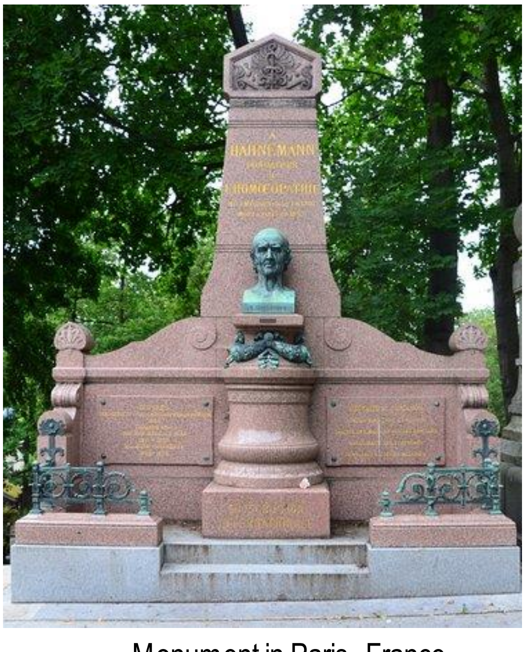
Exercise 3. Write a small essay on the topic.

Exercise 4. Transfer the given information from the passages onto a table.

№	A c t i v i t y			
	Event	**When**	**Where**	**Score**
1.				



Samuel Friedrich Christian Hahnemann



Monument in Paris, France

SOME SPECIAL BRANCHES OF MEDICINE AT THE END OF THE 18TH CENTURY

Obstetrics

Down to the 16th century obstetrics was almost exclusively in the hands of midwives, who were trained for it as for a trade. Only in rare cases was a surgeon called in. All the achievements of ancient times seemed forgotten, and it was only after anatomical studies had been resumed and surgery had made some progress that things began to improve.

The most important accounts of the condition of ancient operative obstetrics are found in the Hippocratic writings (position of the child, version or turning, dismemberment of the fetus, parturition chair for facilitating delivery) and in later times in the works of Soranus of Ephesus (2nd century A.D.; protection of the perinaeum), Galen, Celsus, Altius; in those of the female physician Trotula of Salerno.

The oldest book on midwifery in the Middle Ages (Rosengarten) was written by Eucharius Röslin (d. 1526), who, in addition to numerous drugs assisting delivery, mentions "version". Version was put into practice again by Ambroise Pare.

In the 16th century attempts were made to perform the Caesarean operation on the living; in ancient times it was done only after the death of the mother. The first work about this operation was published by the Paris surgeon, François Rousset (1581). The splendid development of obstetrics in France explains why male assistance was more and more sought there. In the first half of the 17th century Hugh Chamberlen invented the obstetrical forceps, selling it to Dutch physicians about 1688.

The well-founded doubts which in preaseptic times many accoucheurs entertained concerning the Caesarean operation, led to so-called symphyseotomy which by widening the pelvis would permit delivery of the fetus.

Ophthalmology

Ophthalmology gained importance much later than obstetrics. In addition to inflammation of the eye and operations on the eyelid, the Hippocratic writings mention amblyopia, nyctalopia, and glaucoma. Celsus describes an operation for cataract (sclerotico-nyxis). Galen gives us the beginnings of physiological optics. The slight ophthalmological knowledge of the Greeks was borrowed by the Arabs, but their lack of anatomical knowledge prevented all progress.

No improvement set in until after the rise of anatomy under Vesalius. Fortunately, this branch had been almost completely in the hands of travelling physicians (cataract operators), but henceforth surgeons with a fixed abode began to turn their attention to it.

In Germany Georg Bartisch (about 1535-1606), "Court eye specialist" at Dresden, wrote the first monograph, a work very highly valued even in later days. Among other things he mentions spectacles for curing squint, eyeglasses and, among operations is the first to describe extirpation of the pupil. The invention of convex spectacles is by some attributed to the Dominican Alexander da Spina (d. 1313). Concave glasses did not appear until the 16th century.

The foundations for further progress in ophthalmology were laid by the anatomists and physicists of the 17th century. In the 18th century, besides anatomy and physiology, the practical side of ophthalmology was also cultivated.

The theory of the sensibility of the retina to light, established by Haller, was further developed by Porterfield and Thomas Young (1773-1829). The latter also described astigmatism and colour-blindness, and discovered that accommodation depended upon a change in the shape of the lens. Boerhave was the first to give clinical lectures on ophthalmology. From him we have the exact definition of myopia and presbyopia. Gray cataract (cataracta) was first located in the lens by François Quarre and Remi Lasnier, a view which was corroborated by the anatomist, Werner Rolfink (1599-1673).

Pharmaceutics & mineral waters & cold water cures

Pharmacy had remained the most backward of all the branches of medicine, for it was longest under the influence of the Arabs. A large part of the drugs came from the Orient to Venice and Flemish harbours. Besides simple drugs there were also a great many compound remedies.

But, in the latter class, there was great confusion resulting from the many adulterations, and from the fact that not only did individual authors give different compositions for the same remedy, but also under the same name an entirely different preparation was understood by different authors.

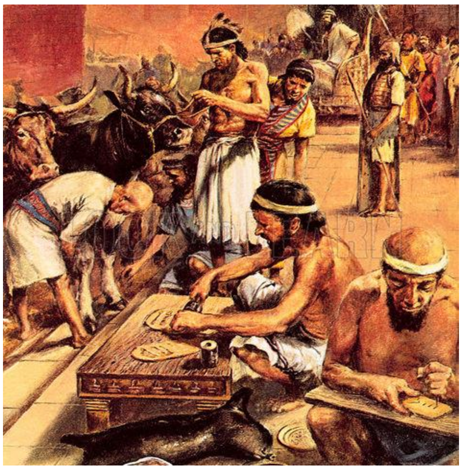
The most famous panacea, which dated from Roman imperial times and was used as late as the eighteenth century, was theriac, a mixture consisting of numerous ingredients, among them being the flesh of vipers. This composition originally came from the Orient, but was made later at Venice, Augsburg, and Vienna. To get some order into the treasury of drugs and to enable apothecaries to compound their remedies, the college of physicians in Florence published a pharmacopoeia (Riceptario) in 1498. The oldest work of this kind in Germany was written by Valerius Cordus, a Nuremberg physician (1546). Not until 1618 did Vienna receive a dispensatorium prepared from that of Augsburg, which had become a model for all Germany.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Choose the keywords that best convey the gist of the information.

Exercise 3. Transfer the given information from the passages onto a table.

№	Activity			
	Who	When	Where	Score
1.				





A BRIEF REVIEW

The Oriental trade in drugs was greatly facilitated by the discovery of the sea route to the East Indies. Uninfluenced by exotic remedies of scholastic medicine, popular medicine offered poor people, in addition to repulsive and superstitious remedies, a series of valuable remedies, derived from native plants and minerals. A long-known and popular remedy for syphilis was mercury, introduced into scientific therapeutics by Paracelsus. To his adherents we are indebted for the use of preparations of antimony and arsenic, a popular remedy for skin diseases since ancient times.

The first-mentioned preparations gave rise to a violent struggle on the part of the Paris faculty, which opposed every form of progress. Guaiac wood, regarded as a specific remedy for syphilis, was brought from America in the 16th century.

The most important drugs introduced in the seventeenth century were ipecacuanha and Peruvian bark. The latter, coming from Peru, became known in Europe between 1630 and 1640.

No remedy has had such a beneficial effect, but none has met with such opposition on the part of many physicians as this, because its effect (reduction of fever without subsequent intestinal evacuation) was a direct contradiction of Galenic doctrine. Peruvian bark was introduced generally into therapeutics only after a long struggle, principally because important men like Sydenham advocated it.

The latter as well as the Leyden school under Boerhave discontinued to a large extent the old Arab drugs, preferring in general simple remedies with a corresponding dietetic treatment. Besides the improvement in lead preparations by Thomas Goulard (1750; aqua Goulardi), we may mention the pharmacological investigations of cornium, aconite, stramonium, by Anton Storck (1731-1803), in Vienna.

Hahnemann's services in investigating native medicinal plants have been previously mentioned. The impulse to study mineral springs was in modern times given by Paracelsus.

The majority of the modern European watering places of worldwide fame were already known to the Romans, but their curative properties were too little valued during the Middle Ages.

Helmont, who was the first to prove the existence of carbonic acid and of fixed alkalies, wrote about Spa. Highly meritorious also was the work in this field of Johann Phillip Seip (Pyrmont) and of Friedrich Hoffmann, who wrote about Spa, Selters, Schwalbach and Karlsbad, and taught the preparation of Seidlitz salt (Bittersalz), artificial Rarlsbad, and of artificial mineral waters.

Cold-water cures were introduced in ancient Rome for the first time by Asclepiades, but they were soon forgotten. In sporadic cases cold water was employed therapeutically in later times, e.g. by Rhazes for smallpox, by Edward Baynard in 1555 against the plague by John Floyer (1649-1734) for mania, and by several others.

Cold water was not used systematically until the eighteeth century.

The brothers Johann Sigismund and Johann Gottfried, and their father Sigismund Hahn (1662-1742), who in 1737 made extensive experiments during an epidemic of petechial fever in Breslau, may be regarded as the founders of the cold water cure. The work of John Sigismund (Unterricht von der kraft und Wirkung des kalten Wassers) is the best known, and laid the foundation of modern hydrotherapeutics. Towards the end of the 18th century Johann Dietrich Brandis obtained good results in the treatment of febrile diseases by means of tepid lotions.

The subsequent development of hydrotherapeutics was largely influenced by the results obtained by William Wright (1736-1819), and James Currie (1750-1805) in the epidemics of petechial fever in the years 1787-92. Even in the oldest times people seem to have possessed an efficient preservative against one of the most destructive epidemics, smallpox (*variola*).

From remote antiquity the Brahmins of Hindustan are said to have transferred the smallpox poison (secretion of the pustules) to healthy persons by incising the skin with the object of protecting them against further infection by causing a local illness.

In China people stopped up their noses with the incrustations of smallpox. A peculiar transfer with a needle (inoculation) was in use among the Circassians and Georgians.

This so-called Greek method became generally known in Constantinople towards the end of the 17^{th} century. It was introduced into England by Lady Wortley Montague wife of the English ambassador, who had had her own son successfully vaccinated in 1717. Despite the loud approval of the court and aristocracy, inoculation met with violent resistance from the physicians and clergy.

Carelessness, quackery, and its ill-repute caused the method to be forgotten, until in 1746 Bishop Isaac Maddox of Worcester, by popular teaching and the establishment of institutions for inoculation, once more proclaimed its value.

Among physicians who favoured inoculation were Richard Mead (1673-1754). Robert and Daniel Sutton (1760, 1767), Thomas Disdale (1767), Theodore Tronchin (1709-1781), and Haller.

In Austria it was introduced by van Swieten, at whose suggestion Maria Theresa, in 1768, called to Vienna the famous naturalist Jan Ingen-Housz (1730-99), in spite of the opposition of the clinical professor de Haen. In the meantime another opponent of inoculation appeared.

In countries devoted to cattle-raising it was observed that those who came in contact with cows suffering from smallpox frequently fell sick and had pustules on their fingers, but such persons were immune against the human smallpox. This incited the physician Edward Jenner (1749-1823) to further experimentation, which he continued for twenty years.

On 14 May, 1796, he performed his first inoculation with the lymph of cowpox (vaccination), an experiment of worldwide importance. Jenner's discovery was everywhere received with enthusiastic approval. The first vaccinations on the continent were performed at Vienna by Jean de Caro in in 1799, and by his contemporaries Alois Careno (d. 1811) and Paschalis Joseph von Ferro (d. 1809); in Germany, by Germany, by Georg Friedrich Ballhorn (1772-1805) and Christian Friedrich Stromeyer (1761-1824).

In France, by Rochefoucauld-Liancourt protective inoculation with vaccine has been introduced into almost every civilized state in the course of the 19th century, partly from free choice and partly by laws enforcing compulsory vaccination.

Exercise 1. Give the main idea of the text in some English sentences.

Exercise 2. Transfer the given information from the passages onto a table.

№	Activity			
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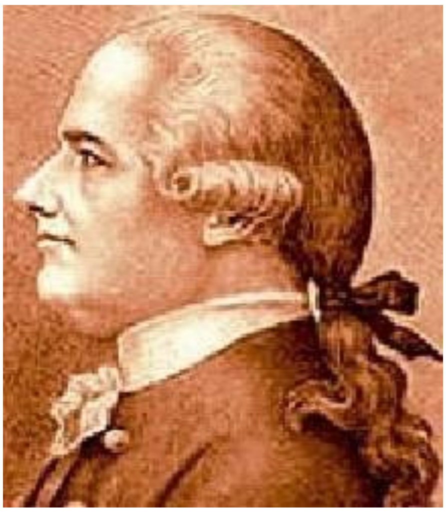
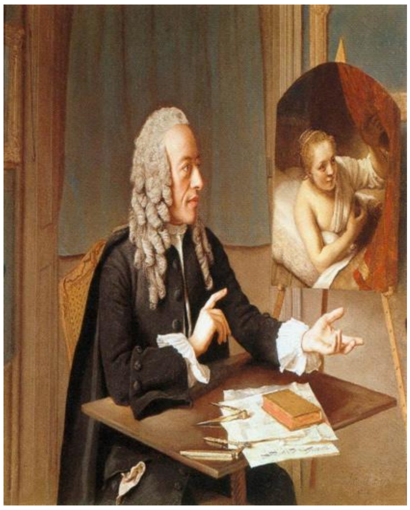
1.				





Jan Ingen-Housz Richard Mead Theodore Tronchin

MEDICINE IN THE 19TH CENTURY

The powerful political position of France in the first thirty years of the nineteenth century finds medicine in an especially high state of development in that country. After this period followed the golden period of the Vienna school and in a wider sense, of German medicine.

The development of modern medicine is the work of all civilized nations; yet all will regard Rudolf Virchow unqualifiedly as the chief worker. Not to encroach upon the domain of the special articles, let us summarize in a few brief words the most important achievements of recent times:

- in anatomy, theory of tissues – Bichat;
- in pathological anatomy and pathology cellular, pathology – Virchow;
- in physiology – Johannes Müller,
- in practical medicine, auscultation – Laënnec, Skoda;
- in surgery, treatment of wounds – Joseph Lister;
- narcosis – Jackson, Simpson;
- obstetrics, cause of puerperal fever Semmelweiss;
- in ophthalmology – Albrecht von Grafe and (speculum oculi) Helmholtz;
- in bacteriology and serotherapy – Pasteur, Koch, and Behring.

The subject of skin diseases was most ingeniously elaborated by Ferdinand Hebra.

General anatomy

A splendid basis for the further development of modern medicine was laid by Marie François Xavier Bichat (1771-1802), through his investigation of the vital qualities of tissues. What Haller had tried to do for the muscles, Bichat attempted to accomplish for all the tissues of the body. Bichat was the first to promulgate the idea that each tissue might by itself become diseased, and that the symptoms of diseased organs depend upon tissue changes.

Gilbert Breschet (1784-1845) worked on the lympathic vessels and the history of developments and Isidore Geoffrey Saint-Hilaire (1772-1884) on comparative anatomy. Of Italian and English anatomists are to be mentioned: Paolo Mascagni (1752-1815; lymphatic vessels, comparative anatomy), Antonio Scarpa (1747-1832; structure of the bones, organs of sense), the brothers John and Charles Ball, the latter (1774-1842) known also as a physiologist (brain, nerves); and Robert Knox (1793-1862; comparative anatomy). Germany performed the greatest services in perfecting anatomy and allied branches.

The first to be named in this connection is Theodor Schwann (1810-82), the discoverer of the cell as the fundamental element of the body of plants and animals.

Friedrich Gustav Jakob Henle (1809-85), & Wilhelm Menke (1834-96) were prominent teachers of general anatomy and histology, Friedrich Tiedemann (1781-1861) was an eminent brain anatomist, while Nikolaus Rüdinger (1832-96; injection of carbolic for the preservation of corpses in the dissecting room), Friedrich Sigmud Merkel (b. 1845; topographical anatomy) and Wilhelm His (b. 1831; history of development), must also be mentioned.

Following the reform of studies under van Swieten in 1749, anatomy was cultivated in Vienna more than ever before. The founder of the modern anatomical school of Vienna was the highly gifted Joseph Hyrtl (1811-94); technique of injection and corrosion, organ of hearing, comparative and topographical anatomy), known as a pre-eminent teacher, investigator, and a man of noble character.

In North America anatomy was cultivated especially in Philadelphia where besides the school founded in 1764, there existed from 1820 to 1875 a private institution established "The Philadelphia School of Anatomy". In 1775 Japan became acquainted for the first time with the anatomical knowledge of Europe through a translation of a work by the German Johann Adam Kulmus which had appeared in 1725. A diligent study of anatomy and of medicine in general began when the University of Tokio was established in 1871.

Pathological Anatomy

Pathological anatomy was placed upon a new basis by Bichat's theory of the tissues, and it was later greatly advanced by physiology, physiological chemistry, and by improved means of investigation (compound achromatic objective lens of the microscope). The increased attention, which clinical physicians bestowed on this subject, exercised no small influence on its progress.

Among these must be especially mentioned Laënnec, who defined tuberculosis and studied the pathological anatomy of lung diseases, especially of phthisis. Numerous though the able investigators were who performed meritorious services in perfecting this branch, the development of modern pathological anatomy will forever be intimately connected with the names of the pioneers, Rokitansky and Virchow. The first pathological prosectorship at Vienna was held by Alois Rudolph Vetter from 1796 to 1803, well known as the author of the first German work on pathological anatomy.

Rokitansky's training was thus based upon the French school, but he subsequently brought about a still closer connection between anatomical and physical diagnostics. His endeavour to become acquainted with the entire course of development of pathological changes was greatly assisted by the valuable material for dissecting which the metropolis afforded.

His excellence is seen in his descriptions of pathological changes; he replaced the previous symptomatic pictures of disease by creating an anatomical pathology and anatomical types of disease.

He was not so successful in establishing his doctrine of crasis based upon humoral pathology and just here Virchow's fruitful activity begins.

Rudolf Virchow (1821-1902), professor in Berlin and a pupil of Johannes Müller and Johann Lucas Schönlein, early became acquainted with the cellular doctrine of Schwann. Virchow is the creator of cellular pathology, which today is universally recognized, a pathology based strictly upon natural science which definitively extinguished Hippocratic speculative humoral pathology.

According to Virchow, there is life in the smallest units of the body in the cells which increase by fission (*omnis cellula e cellula*). He applied his doctrine to the various tissues, and showed their behavior under normal and abnormal conditions of life. Diseases thus represent a reaction of the sum of the cells which form the body against harmful influences, the causes of diseases.

Virchow's chief work" Die Cellularpathologie" appeared in 1858. Greater attention was now paid not alone to pathological anatomy, but to its sister sciences, pathological chemistry, experimental pathology, and bacteriology.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Translate the words and phrases into Russian.

Investigation of the vital qualities of tissues; pathological anatomy; general anatomy; anatomical and physical diagnostics’ anatomical types of disease; humoral pathology; normal and abnormal conditions of life; pathological chemistry, experimental pathology, and bacteriology; doctrine to the various tissues; speculative humoral pathology; histology; symptomatic pictures of disease.

Exercise 3. Make up a small report and give a talk in class.

Exercise 4. Make up some dialogues from the information above.

Exercise *5. Transfer the given information from the passages onto a table.*

№	Activity			
	Event	When	Where	Score
1.				

VARIES MEDICAL THEORIES

The first to suspect that living beings invade the organism and exist in the blood and pus was the learned Jesuit Athanasius Kircher (1671), although there is no doubt that the "little worms" observed by him were really blood-corpuscles. With the help of his improved microscope Leeuwenhoek discovered a number of bacteria. The idea that infectious diseases were caused by a living contagion invading the body from without was first expressed in 1762 by the Vienna physician Markus Antonius Plenciz (d. 1786). Otto Friedrich Muller, in 1786, was the first to doubt that the microscopical living beings, then comprised under the name of *infusoria*, really belonged to the animal kingdom.

In 1838, Christian Gottfried Ehrenberg gave a description of the finer structure of the "infusoria" but it was Ferdinad Cohn, who in 1854 first ascertained with certainty that bacteria belonged to the vegetable kingdom. From the studies that were now made concerning the vital qualities of these infinitesimal living beings of the vegetable kingdom, Louis Pasteur (1822-95) definitely settled the controversy about spontaneous generation, and proved the materialistic view to be without foundation.

What Plenciz had only suspected was now clearly formulated by Henle, who defined the conditions under which bacteria are to be regarded as direct causes of disease.

The untiring activity of Robert Koch (d. 1910) from about 1878 succeeded in bringing bacteriology to such a state of development that it could be made of service to practical medicine.

Apart from ascertaining the bacterial origin of cholera and tuberculosis, Koch's greatest achievements are the improvement of the microscope, the method of colouration and pure cultures.

Jenner's success with the lymph of cowpox, a weakened poison as a protection against a full poison, as well as the old experience that those who had once recovered from an infectious disease usually became immune from new infection, led savants to look for the cause of the phenomena.

In 1880 Pasteur, on the basis of his experiments concerning chicken cholera, looked for the cause in the exhaustion of the nutritive material necessary for the bacteria in the body (theory of exhaustion). The investigation of Metschnikoff, and in 1889 of Buchner, advanced the idea that blood-serurn possesses a certain hostility to bacteria.

In 1890 Von Behring proved that the blood-serum of animals which has been made immune against diphtheria, if injected into another animal, would make the latter also immune against diphtheria. That element in the serum hostile to bacteria he called antitoxin. The introduction of antitoxin into the therapeutics of diphtheria in 1892 was so far the greatest practical success of bacteriology. Efforts were naturally made to secure by similar methods protection against other infectious diseases, efforts only partly crowned with success (tetanus, plague, cholera, snake poison).

Following Jenner's method of producing immunity by means of living, weakened causes of infection, Pasteur (1885) found a protection against lyssa, while Haffkine made experiments in 1895 to combat cholera with killed germs, and in 1897 similar experiments with the plague.

From 1891 dates Koch's experimentation with extracts of bacteria against tuberculosis.

By means of preparations of pure bacteria-cultures, made according to Koch's method, it became possible to devise exact methods for destroying bacteria. In the field of the modern theory of disinfection, Koch also worked as a pioneer, not only in precisely defining the difference between prevention of development and the killing of bacteria, but also by subjecting physical and chemical disinfectants to new tests. The modern steam sterilizers are based upon the discovery of Koch.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Define bacteriology, theory of immunity, serotherapy, and disinfection.

	Notion	When	Where	Score
1.				

Exercise 3. Classify the notion "psychiatry".

As to progress in psychiatry, there is now a more humane conception of the care for the insane compared with that obtaining in former times. This movement originated principally in England (Thomas Arnold, d. 1816; William Perfect, b. 1740; Alexander Crichton, 1763-1856), & France (Philippe Pinel, 1755-1826; Jean Etienne Dominique Esquirol, 1772-1840), & found in Italy in Vincenzo Chiarugi (d.1822) and in Germany in Johann Christian Reil (1759-1813), zealous supporters.

With this movement came a general and profounder study of the subject stimulated by the results of pathological anatomy, more judicious therapeutics conscious of its aim, proper physical occupation of the insane, and the discontinuance of the isolation system.

Special attention is paid to the etiology and therapeutics of diseases occurring most frequently, cretinism, hysteria, progressive paralysis, as well as to psychosis of intoxication, alcoholism, morphinism, etc.

Modern dermatology begins with the endeavours of Johann Jakob Plenk (1738-1807) at Vienna to establish a classification of skin diseases on a basis of external clinical appearance.

The pathological-anatomical method, introduced by Julius Rosenbaum (1807-74) was established by Ferdinand Hebra in Vienna (1816-80). Its chief merits consist in creating a classification of twelve groups, valid in its substantial form even today, in a definition of the general course of the disease, and in simplifying therapeutics. His chief special studies are concerned with itch, lepra, and eczema. In recent times we notice an endeavour to define more closely the course of the disease, a movement started by Paul Gerson Unna in Hamburg (b. 1850; histodermatology, histotherapy, bacteriology of acne, eczema, impetigo, and favus.

Exercise 4. Make up a small report and give a talk in class.

UNITII. MODERN MEDICINE

INTRODUCTION

Medicine was revolutionized in the 19th century and beyond by advances in chemistry and laboratory techniques and equipment, old ideas of infectious disease epidemiology were replaced with bacteriology and virology. Bacteria and microorganisms were first observed with a microscope by Antonie van Leeuwenhoek in 1676, initiating the scientific field microbiology.

Ignaz Semmelweis (1818-1865) in 1847 dramatically reduced the death rate of new mothers from childbed fever by the simple expedient of requiring physicians to clean their hands before attending to women in childbirth. His discovery pre-dated the germ theory of disease.

However, his discoveries were not appreciated by his contemporaries and came into general use only with discoveries of British surgeon Joseph Lister, who in 1865 proved the principles of antisepsis in the treatment of wounds. However, medical conservatism on new breakthroughs in pre-existing science prevented them from being generally well received during the 19th century.

After Charles Darwin's 1859 publication of *The Origin of Species*, Gregor Mendel (1822-1884) published in 1865 his books on pea plants, which would be later known as Mendel's laws. Re-discovered at the turn of the century, they would form the basis of classical genetics.

The 1953 discovery of the structure of DNA by Watson and Crick would open the door to molecular biology and modern genetics. During the late 19th century and the first part of the 20th century, several physicians, such as Nobel Prize winner Alexis Carrel, supported eugenics, a theory first formulated in 1865 by Francis Galton. Eugenics was discredited as a science after the Nazis' experiments in World War II became known; however, compulsory sterilization programs continued to be used in modern countries (including the US, Sweden and Peru) until much later.

Semmelweis's work was supported by the discoveries made by Louis Pasteur. Linking microorganisms with disease, Pasteur brought about a revolution in medicine. He also invented with Claude Bernard (1813-1878) the process of pasteurization still in use today. His experiments confirmed the germ theory. Claude Bernard aimed at establishing scientific method in medicine; he published *An Introduction to the Study of Experimental Medicine* in 1865.

Beside this, Pasteur, along with Robert Koch (who was awarded the Nobel Prize in 1905), founded bacteriology. Koch was also famous for the discovery of the tubercle bacillus (1882) and the cholera bacillus (1883) and for his development of Koch's postulates. The participation of women in medical care (beyond serving as midwives, sitters and cleaning women) was brought about by the likes of Florence Nightingale. These women showed a previously male dominated profession the elemental role of nursing in order to lessen the aggravation of patient mortality which resulted from lack of hygiene and nutrition. Nightingale set up the St.Thomas hospital, post-Crimea, in 1852.

Elizabeth Blackwell (1821-1910) became the first woman to formally study, and subsequently practice, medicine in the United States. It was in this era that actual cures were developed for certain endemic infectious diseases. However the decline in many of the most lethal diseases was more due to improvements in public health and nutrition than to medicine. It was not until the 20th century that the application of the scientific method to medical research began to produce multiple important developments in medicine, with great advances in pharmacology and surgery.

During the First World War, Alexis Carrel and Henry Dakin developed the Carrel-Dakin method of treating wounds with irrigation, Dakin's solution, a germicide which helped prevent gangrene.

The Great War spurred the usage of Roentgen's X-ray, and the electrocardiograph, for the monitoring of internal bodily functions. This was followed in the inter-war period by the development of the first anti-bacterial agents such as the sulpha antibiotics.

The Second World War saw the introduction of widespread and effective antimicrobial therapy with the development and mass production of penicillin antibiotics, made possible by the pressures of the war and the collaboration of British scientists with the American pharmaceutical industry.

Lunatic asylums began to appear in the Industrial Era. Emil Kraepelin (1856-1926) introduced new medical categories of mental illness, which eventually came into psychiatric usage despite their basis in behavior rather than pathology or etiology. In the 1920s surrealist opposition to psychiatry was expressed in a number of surrealist publications.

In the 1930s several controversial medical practices were introduced including inducing seizures (by electroshock, insulin or other drugs) or cutting parts of the brain apart (leucotomy or lobotomy). Both came into widespread use by psychiatry, but there were grave concerns and much opposition on grounds of basic morality, harmful effects, or misuse.

In the 1950s new psychiatric drugs, notably the antipsychotic chlorpromazine, were designed in laboratories and slowly came into preferred use. Although often accepted as an advance in some ways, there was some opposition, due to serious adverse effects such as tardive dyskinesia.

Patients often opposed psychiatry and refused or stopped taking the drugs when not subject to psychiatric control. There was increasing opposition to the use of psychiatric hospitals, and attempts to move people back into the community on a collaborative user-led group approach ("therapeutic communities") not controlled by psychiatry. Campaigns against masturbation were done in the Victorian era and elsewhere. Lobotomy was used until the 1970s to treat schizophrenia.

This was denounced by the anti-psychiatric movement in the 1960s and later.

The 20th century witnessed a shift from a master-apprentice paradigm of teaching of clinical medicine to a more "democratic" system of medical schools. With the advent of the evidence-based medicine and great advances of information technology the process of change is likely to evolve further, with greater development of international projects such as the Human genome project.

Exercise 1. Summarize the information briefly in English.

Exercise 2. Translate the words and phrases into Russian drawing up sentences with them.

Healthy (robust, sound, strong, well); a healthy sum; a healthy appetite; healthy carrier; healthy (fair) competition; healthy environment; healthy growth; healthy home; health-visitor service; healthful; healthfully(healthily); healthfulness (healthiness); the healthiness of the climate; healthism; healthless (unhealthy); healthsome; unhealthy climate; unhealthy trades; unwholesome; an unwholesome climate; an unhealthy complexion; an unhealthy atmosphere; it's unhealthy to smoke.

Exercise 3.Translate the sentences with the keyword «healthy».

1. Smoking is not healthy for you. 2. To walk three miles every day is a beastly bore, but healthy. 3. He exerted deep and healthy influence upon society. 4. I want to impress on them that they'll find it healthier not to try for more. *5.* The USA is an economically healthy state. 6. I have got healthy bank account. *7.* The family is the basis of any healthy society. *8.* Most of us need to lead more balanced lives to be healthy and happy. 9. She had a normal pregnancy and delivered a healthy child. 10. If a feature or quality that you have is healthy, it makes you look well or shows that you are well.

Exercise 4. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 5. Read the text and title it.

Modern scientific biomedical research (where results are testable and reproducible) began to replace early Western traditions based on herbalism, the Greek "four humours" and other such pre-modern notions. The modern era really began with Robert Koch's discoveries around 1880 of the transmission of disease by bacteria, and then the discovery of antibiotics around 1900.

The post-18th century modernity period brought more groundbreaking researchers from Europe.

From Germany and Austrian doctors such as Rudolf Virchow, Wilhelm Conrad Röntgen, Karl Landsteiner, and Otto Loewi) made contributions. In the United Kingdom Alexander Fleming, Joseph Lister, Francis Crick, and Florence Nightingale are considered important. From New Zealand and Australia came Maurice Wilkins, Howard Florey, and Frank Macfarlane Burnet).

In the United States William Williams Keen, Harvey Cushing, William Coley, James D. Watson, Italy (Salvador Luria), Switzerland (Alexandre Yersin), Japan (Kitasato Shibasaburo), and France (Jean-Martin Charcot, Claude Bernard, Paul Broca and others did significant work. Russian (Nikolai Korotkov also did significant work, as did Sir William Osler and Harvey Cushing.

As science and technology developed, medicine became more reliant upon medications.

Throughout history and in Europe right until the late 18th century not only animal and plant products were used as medicine, but also human body parts and fluids. Pharmacology developed from herbalism and many drugs are still derived from plants (atropine, ephedrine, warfarin, aspirin, digoxin, vinca alkaloids, taxol, hyoscine, etc). The first of these was arsphenamine / Salvarsan discovered by Paul Ehrlich in 1908 after he observed that bacteria took up toxic dyes that human cells did not. Vaccines were discovered by Edward Jenner and Louis Pasteur. The first major class of antibiotics was the sulfa drugs, derived by French chemists originally from azo dyes. This has become increasingly sophisticated; modern biotechnology allows drugs targeted towards specific physiological processes to be developed, sometimes designed for compatibility with the body to reduce side-effects.

Genomics and knowledge of human genetics is having some influence on medicine, as the causative genes of most monogenic genetic disorders have now been identified, and the development of techniques in molecular biology and genetics are influencing medical technology, practice and decision-making. Evidence-based medicine is a contemporary movement to establish the most effective algorithms of practice (ways of doing things) through the use of systematic reviews and meta-analysis. The movement is facilitated by the modern global information science, which allows all evidence to be collected and analyzed according to standard protocols which are then disseminated to healthcare providers. One problem with this "best practice" approach is that it could be seen to stifle novel approaches to treatment.

The Cochrane Collaboration leads this movement. A 2016 review of 160 Cochrane systematic reviews revealed that, according to two readers, 21.3% of the reviews concluded insufficient evidence, 20% concluded evidence of no effect, and 22.5% concluded positive effect.

Exercise 6. Digest the score of the information briefly in English.

Exercise 7. Translate the words and phrases into Russian.

Monogenic genetic disorders; healthcare providers; insufficient evidence; herbalism; physicians; azo dyes; modern global information science; investigations; favourable conditions; successful development.

Exercise 8. Transfer the given information from the passages onto a table.

№	Activity			
	Who	When	Where	Score
1.				

Exercise 9. Read and translate the text on the history of medicine in Ukraine.

The history of medicine in Ukraine begins with the history of folk medicine.

The first medical hospitals in Kyiv Rus were founded in the 11th century and were mostly in the form of alms – houses attached to churches. In the 14th and 15th centuries new hospitals were built and many physicians gave the first aid to the inhabitants of Ukraine and the soldiers of Bogdan Khmelnytsky's troops. As the number of physicians was inadequate some medical schools which trailed specialists were opened. Kyiv Academy was founded in 1632. It played a prominent role in the development of the Russian medicine. Many graduates of the Academy continued to enrich their knowledge abroad and received their doctors' degrees there. Many former students of this Academy have become the well-known scientists. They are the epidemiologist D. S. Samoilovych, the obstetrician N, M. Ambodyk-Maximovych, the podiatrist S. F. Chotovytsky, the anatomist 0. M. Shumlyansky and many .others.

At the end of the l8th and during the 19th centuries the medical departments were formed at the Universities of Kharkiv, Kyiv, Lviv and Odesa. The total number of physicians has increased m Ukraine. The medicine of Zemstvo was widely used at that time. During the Crimean War (1854-1856), upon Pirogov's initiative the first detachment of nurses was trained and sent to Sevastopol to help its defenders. It gave the beginning of the organization "Red Cross".

In 1686 the first bacteriological station was organized in Odesa which was of great importance in the development of microbiology and epidemiology. The famous scientists I. I. Mechnikov and M. F. Gamaliya worked at this station and succeeded much in their investigations. Inspite of favourable conditions for the successful development of natural sciences in Russia many outstanding scientists worked in Ukraine. It is known that the brilliant scientist M. I. Pirogov and his followers, as V. O. Karavayev, O. F. Shimanovsky, M. V. Sklifosovsky and others made valuable contribution in the Russian medicine.

The famous scientists V. P. Obraztsov and M. D. Strazhesko were founders of Kyiv therapeutist' school. They made a huge progress in the field of cardiology Winch was done in the treatment of many eye diseases by the prominent scientist, academician V. P. Filatov who founded the Institute of Eye diseases in Odesa. Many other outstanding scientists worked in Ukraine whose names are well known m the world.

Exercise 10. Answer the questions.

1. What does the history of medicine in Ukraine begin with? 2. When were the first medical hospitals founded in Kyiv? 3. What form were the first Kyiv hospitals in? 4. When were new hospitals built? Whom did many physicians give the first aid to? 5. When was Kyiv Academy founded? 6. Where did many physicians receive their doctors' degrees? 7. What former students of the Academy have become the well-known scientists? 8. What Universities were the medical departments founded at? 9. What medicine was widely used at that time? 10. When was the first detachment of nurses trained? 11. When and where was the, first bacteriological station organized?

Exercise 11. Translate the text on history of medicine in Ukraine into English.

История медицины в Украине начинается историей народной медицины. Первые медицинские больницы в Киевской Руси были основаны в 11 веке и были прикреплены в основном в виде (форме) убежищ в церкви. В 14 и 15 веках были построены новые больницы и многие врачи оказывали первую помощь жителям Украины и солдатам войск Богдана Хмельницкого. Поскольку количество врачей была не достаточным были открыты медицинские школы, которые готовили специалистов.

Киевская Академия была основана в 1632 году. Она играла выдающуюся роль в развитии украинской медицины. Многие выпускники Академии продолжали обогащать свои знания за рубежом и получили там докторские степени. Многие бывшие студенты Академии стали известными учеными. Это эпидемиолог Д.С. Самойлович, акушер Н.М. Амбодик-Максимович, педиатр С.Ф. Чотовицький, анатом А.Н. Шумлянский и многие другие. В конце 16 века и в течение 19 века медицинские отделы были сформированы в университетах Харькова, Киева, Львова и Одессы. Общее количество врачей возросло в Украине.

В то время широко применялась земская медицина. Во время Крымской войны (1854-1856) из-за инициативы Пирогова был подготовлен первый отряд медсестер и послан в Севастополь помогать защитникам. Это дало начало организации "Красного Креста".

В 1886 году первая бактериологическая станция была организована в Одессе, которая имела большое значение в развитии микробиологии и эпидемиологии. Известные ученые И.И. Мечников и М.Ф. Гамалия работали на этой станции и достигли значительного успеха в исследованиях. Несмотря на благоприятные условия для успешного развития природных наук в России много известных ученых работали в Украине. Известно, что гениальный ученый Н.И. Пирогов и его последователи, такие как В. А. Караваев и А.Ф. Шимановский, Н. В. Склифосовский и другие внесли значительный вклад в украинском медицину. Известные ученые В.П. Образцов и Н. Д. Стражеско были основателями Киевской терапевтической школы. Они достигли (сделали) огромный прогресс в поле (отрасли) кардиологии. Много было сделано в лечении многих глазных болезней выдающимся ученым, академиком В.П. Филатовым, который основал институт глазных болезней в Одессе. Многие другие известные ученые работали в Украине, чьи имена известны во всем мире.

Exercise 12. Describe the institutions of health care systems.

Contemporary medicine is in general conducted within health care systems.

Legal, credentialing and financing frameworks are established by individual governments, augmented on occasion by international organizations. The characteristics of any given health care system have significant impact on the way medical care is provided.

Advanced industrial countries (with the exception of the United States) and many developing countries provide medical services though a system of universal health care which aims to guarantee care for all through a single-payer health care system, or compulsory private or co-operative health insurance. This is intended to ensure that the entire population has access to medical care on the basis of need rather than ability to pay.

Delivery may be via private medical practices or by state-owned hospitals and clinics, or by charities; most commonly by a combination of all three. Most tribal societies, but also some communist countries (e.g. China) and the United States, provide no guarantee of health care for the population as a whole. In such societies, health care is available to those that can afford to pay for it or have self insured it. Transparency of information is another factor defining a delivery system.

Access to information on conditions, treatments, quality and pricing greatly affects the choice by patients / consumers and therefore the incentives of medical professionals. While the US health care system has come under fire for lack of openness, new legislation may encourage greater openness. There is a perceived tension between the need for transparency on the one hand and such issues as patient confidentiality and the possible exploitation of information for commercial gain on the other.

CLINICAL PRACTICE

In clinical practice doctors personally assess patients in order to diagnose, treat, and prevent disease using clinical judgment. The doctor-patient relationship typically begins an interaction with an examination of the patient's medical history and medical record, followed a medical interview and a physical examination. Basic diagnostic medical devices (e.g. stethoscope, tongue depressor) are typically used. After examination for signs and interviewing for symptoms, the doctor may order medical tests (e.g. blood tests), take a biopsy, or prescribe pharmaceutical drugs or other therapies.

Differential diagnosis methods help to rule out conditions based on the information provided.

During the encounter, properly informing the patient of all relevant facts is an important part of the relationship and the development of trust. The medical encounter is then documented in the medical record, which is a legal document in many jurisdictions. Followups may be shorter but follow the same general procedure. The components of the medical interview and encounter are:

- Chief complaint (cc): the reason for the current medical visit. These are the "symptoms".

They are in the patient's own words and are recorded along with the duration of each one. Also called 'presenting complaint.'

- History of present illness / complaint (HPI): the chronological order of events of symptoms and further clarification of each symptom.
- Current activity: occupation, hobbies, what the patient actually does.
- Medications (Rx): what drugs the patient takes including prescribed, over-the-counter, and home remedies, as well as alternative and herbal medicines/herbal remedies. Allergies are also recorded.
- Past medical history (PMH/PMHx): concurrent medical problems, past hospitalizations and operations, injuries, past infectious diseases and/or vaccinations, history of known allergies.
- Social history (SH): birthplace, residences, marital history, social and economic status, habits (including diet, medications, tobacco, and alcohol).
- Family history (FH): listing of diseases in the family that may impact the patient. A family tree is sometimes used.
- Review of systems (ROS) or systems inquiry: a set of additional questions to ask which may be missed on HPI: a general enquiry (have you noticed any weight loss, change in sleep quality, fevers, lumps and bumps? etc), followed by questions on the body's main organ systems (heart, lungs, digestive tract, urinary tract).

The physical examination is the examination of the patient looking for signs of disease ('Symptoms' are what the patient volunteers, "Signs" are what the healthcare provider detects by examination).

The healthcare provider uses the senses of sight, hearing, touch, and sometimes smell (taste has been made redundant by the availability of modern lab tests). Four chief methods are used: inspection, palpation (feel), percussion (tap to determine resonance characteristics), and auscultation (listen); smelling may be useful (e.g. infection, uremia, diabetic ketoacidosis).

Exercise 1. Explain the notion «Medicine» as a specialty.

Internal medicine is the medical specialty concerned with the diagnosis, management and nonsurgical treatment of unusual or serious diseases, either of one particular organ system or of the body as a whole. According to some sources, an emphasis on internal structures is implied. In North America, specialists in internal medicine are commonly called "internists".

Elsewhere, especially in Commonwealth nations, such specialists are often called physicians.

These terms, internist or physician, generally excludes practitioners of gynecology and obstetrics, pathology, psychiatry, and especially surgery and its subspecialities. Because their patients are often seriously ill or require complex investigations, internists do much of their work in hospitals.

Formerly, many internists were not subspecialized; such general physicians would see any complex nonsurgical problem; this style of practice has become much less common. In modern urban practice, most internists are subspecialists: that is, they generally limit their medical practice to problems of one organ system or to one particular area of medical knowledge. Elsewhere, especially in North America, general pediatrics is often a form of Primary care.

Exercise 2. Analyze the information and define the clinical examination.

The clinical examination involves study of:

- Vital signs including height, weight, body temperature, blood pressure, pulse, respiration rate, hemoglobin oxygen saturation.
- General appearance of the patient and specific indicators of disease (nutritional status, presence of jaundice, pallor or clubbing).
- Skin.
- Head, eye, ear, nose, and throat (HEENT).
- Cardiovascular (heart and blood vessels).
- Respiratory (large airways and lungs).
- Abdomen and rectum.
- Genitalia (and pregnancy if the patient is or could be pregnant).
- Musculoskeletal (including spine and extremities).
- Neurological (consciousness, awareness, brain, vision, cranial nerves, spinal cord and peripheral nerves).
- Psychiatric (orientation, mental state, evidence of abnormal perception or thought).

Laboratory and imaging studies results may be obtained, if necessary. The medical decision-making (MDM) process involves analysis and synthesis of all the above data to come up with a list of possible diagnoses (the differential diagnoses), along with an idea of what needs to be done to obtain a definitive diagnosis that would explain the patient's problem.

The treatment plan may include ordering additional laboratory tests and studies, starting therapy, referral to a specialist, or watchful observation. Follow-up may be advised. This process is used by primary care providers as well as specialists. It may take only a few minutes if the problem is simple and straightforward. On the other hand, it may take weeks in a patient who has been hospitalized with bizarre symptoms or multi-system problems, with involvement by several specialists.

On subsequent visits, the process may be repeated in an abbreviated manner to obtain any new history, symptoms, physical findings, and lab or imaging results or specialist consultations.

Exercise 3. Read the information and classificate the provision of medical care.

Provision of medical care is classified into primary, secondary and tertiary care categories. Primary care medical services are provided by physicians, physician assistants, nurse practioners, or other health professionals who have first contact with a patient seeking medical treatment or care.

These occur in physician offices, clinics, nursing homes, schools, home visits and other places close to patients. About 90% of medical visits can be treated by the primary care provider.

These include treatment of acute and chronic illnesses, preventive care and health education for all ages and both sexes. Secondary care medical services are provided by medical specialists in their offices or clinics or at local community hospitals for a patient referred by a primary care provider who first diagnosed or treated the patient. Referrals are made for those patients who required the expertise or procedures performed by specialists.

These include both ambulatory care and inpatient services, emergency rooms, intensive care medicine, surgery services, physical therapy, labor and delivery, endoscopy units, diagnostic laboratory and medical imaging services, hospice centers, etc. Some primary care providers may also take care of hospitalized patients and deliver babies in a secondary care setting.

Tertiary care medical services are provided by specialist hospitals or regional centers equipped with diagnostic and treatment facilities not generally available at local hospitals. These include trauma centers, burn treatment centers, advanced neonatology unit services, organ transplants, high-risk pregnancy, radiation oncology, etc. Modern medical care also depends on information – still delivered in many health care settings on paper records, but increasingly nowadays by electronic means.

Exercise 4. Digest the information briefly in English.

Exercise 5. Describe the score of the surgery.

Surgical specialties employ operative treatment. In addition, surgeons must decide when an operation is necessary, and also treat many non-surgical issues, particularly in the surgical intensive care unit (SICU), where a variety of critical issues arise. Surgery has many subspecialties, e.g. general (transplant, trauma, cardiovascular) surgery, neurosurgery, maxillofacial surgery, orthopedic surgery, otolaryngology, plastic (oncologic, vascular, pediatric) surgery. In some centers, anesthesiology is part of the division of surgery (for logistical and planning purposes), although it is not a surgical discipline.

Surgical training in the U.S. requires a minimum of five years of residency after medical school.

Sub-specialties of surgery often require seven or more years. In addition, fellowships can last an additional 1-3 years. Because post-residency fellowships can be competitive, many trainees devote two additional years to research. Thus in some cases surgical training will not finish until more than a decade after medical school. Furthermore, surgical training can be very difficult and time consuming.

Exercise 6. Name the specialities of internal medicine.

There are many subspecialities (or subdisciplines) of internal medicine:

Cardiology	Endocrinology	Hepatology	Oncology
Critical care medicine	Gastroenterology	Infectious diseases	Pediatrics
Dermatology	Geriatrics	Nephrology	Pulmonology
Emergency medicine	Haematology	Neurology	Rheumatology
			Sleep medicine

Training in internal medicine (as opposed to surgical training), varies considerably across the world: see the articles on Medical education and Physician for more details. In North America, it requires at least three years of residency training after medical school, which can then be followed by a one to three year fellowship in the subspecialties listed above. In general, resident work hours in medicine are less than those in surgery, averaging about 60 hours per week in the USA.

***Exercise 7. Characterise the main features of* basic sciences.**

Exercise 8. Name various branches and basic sciences.

Working together as an interdisciplinary team, many highly-trained health professionals besides medical practitioners are involved in the delivery of modern health care.

Examples include: nurses, emergency medical technicians and paramedics, laboratory scientists, (pharmacy, pharmacists), (physiotherapy, physiotherapists), respiratory therapists, speech therapists, occupational therapists, radiographers, dietitians and bioengineers.

The scope and sciences underpinning human medicine overlap many other fields.

Dentistry, while a separate discipline from medicine, is considered a medical field.

A patient admitted to hospital is usually under the care of a specific team based on their main presenting problem, e.g. the Cardiology team may interact with other specialties.

Physicians have many specializations and subspecializations into certain branches of medicine, which are listed below. There are variations from country to country regarding which specialties certain subspecialties are in. The ***main branches of medicine*** are:

- Basic sciences of medicine; this is what every physician is educated in, and some return to in biomedical research.
- Medical specialties.
- Interdisciplinary fields, where different medical specialties are mixed to function in certain occasions.

Basic sciences

- Anatomy is the study of the physical structure of organisms. In contrast to macroscopic or gross anatomy, cytology and histology are concerned with microscopic structures.
- Biochemistry is the study of the chemistry taking place in living organisms.
- Biostatistics is the application of statistics to biological fields in the broadest sense.

Knowledge of biostatistics is essential in the planning, evaluation, and interpretation of medical research. It is also fundamental to epidemiology and evidence-based medicine.

- Cytology is the microscopic study of individual cells.
- Embryology is the study of the early development of organisms.
- Epidemiology is the study of the demographics of disease processes, and includes, but is not limited to, the study of epidemics.
- Genetics is the study of genes, and their role in biological inheritance.
- Histology is the study of the structures of biological tissues by light microscopy, electron microscopy and immunohistochemistry.
- Immunology is the study of the immune system, which includes the innate and adaptive immune system in humans, for example.
- Medical physics is the study of the applications of physics principles in medicine.
- Microbiology is the study of microorganisms, including protozoa, bacteria, fungi, & viruses.
- Neuroscience includes those disciplines of science that are related to the study of the nervous system. A main focus of neuroscience is the biology and physiology of the human brain and spinal cord.
- Nutrition science (theoretical focus) & dietetics (practical focus) is the study of the relationship of food and drink to health and disease, especially in determining an optimal diet. Medical nutrition therapy is done by dietitians and is prescribed for diabetes, cardiovascular diseases, weight and eating disorders, allergies, malnutrition, and neoplastic diseases.
- Pathology as a science is the study of disease – the causes, progression and resolution thereof.
- Pharmacology is the study of drugs and their actions.
- Physiology is the study of the normal functioning of the body and the underlying regulatory mechanisms.
- Toxicology is the study of hazardous effects of drugs and poisons.

Exercise 9. Name the specialities of internal medicine.

There are many subspecialities (or subdisciplines) of internal medicine:

Cardiology	Endocrinology	Hepatology	Oncology
Critical care medicine	Gastroenterology	Infectious diseases	Pediatrics
Dermatology	Geriatrics	Nephrology	Pulmonology
Emergency medicine	Haematology	Neurology	Rheumatology
			Sleep medicine

Training in internal medicine (as opposed to surgical training), varies considerably across the world: see the articles on Medical education and Physician for more details. In North America, it requires at least three years of residency training after medical school, which can then be followed by a one to three year fellowship in the subspecialties listed above. In general, resident work hours in medicine are less than those in surgery, averaging about 60 hours per week in the USA.

***Exercise 10. Counter diagnostic specialties*.**

Clinical laboratory sciences are the clinical diagnostic services which apply laboratory techniques to diagnosis and management of patients.

In the USA these services are supervised by a pathologist. The personnel that work in these medical laboratory departments are technically trained staff who do not hold medical degrees, but who usually hold an undergraduate medical technology degree, who actually perform the tests, assays, and procedures needed for providing the specific services.

Subspecialties include Transfusion medicine, Cellular pathology, Clinical chemistry, Hematology, Clinical microbiology and Clinical immunology. Pathology as a medical specialty is the branch of medicine that deals with the study of diseases and the morphologic, physiologic changes produced by them. As a diagnostic specialty, pathology can be considered the basis of modern scientific medical knowledge and plays a large role in evidence-based medicine. Many modern molecular tests such as flow cytometry, polymerase chain reaction (PCR), immunohistochemistry, cytogenetics, gene rearrangements studies and fluorescent in situ hybridization (FISH) fall within the territory of pathology.

Radiology is concerned with imaging of the human body, e.g. by x-rays, x-ray computed tomography, ultrasonography, and nuclear magnetic resonance tomography.

Nuclear medicine is concerned with studying human organ systems by administering radiolabelled substances (radiopharmaceuticals) to the body, which can then be imaged outside the body by a gamma camera or a PET scanner.

Exercise 11. Translate the passage into Russian in writing.

Each radiopharmaceutical consists of two parts: a tracer which is specific for the function under study (e.g., neurotransmitter pathway, metabolic pathway, blood flow, or other), and a radionuclide (usually either a gamma-emitter, or a positron emitter). There is a degree of overlap between nuclear medicine and radiology, as evidenced by the emergence of combined devices such as the PET/CT scanner. Clinical neurophysiology is concerned with testing the physiology or function of the central and peripheral aspects of the nervous system. These kinds of tests can be divided into recordings of: (1) spontaneous or continuously running electrical activity, or (2) stimulus evoked responses.

Subspecialties include Electro-encephalography, Electromyography, Evoked potential, Nerve conduction study and Polysomnography. Sometimes these tests are performed by techs without a medical degree, but the interpretation of these tests is done by a medical professional.

Exercise 12. Describe the score of medical education.

Medical education and training varies around the world. It typically involves entry level education at a university medical school, followed by a period of supervised practice or internship, and/or residency. This can be followed by postgraduate vocational training. A variety of teaching methods have been employed in medical education, still itself a focus of active research. Many regulatory authorities require continuing medical education, since knowledge, techniques and medical technology continue to evolve at a rapid rate.

Exercise 13. Explain the legal controls in medicine.

In most countries, it is a legal requirement for a medical doctor to be licensed or registered. In general, this entails a medical degree from a university and accreditation by a medical board or an equivalent national organization, which may ask the applicant to pass exams. This restricts the considerable legal authority of the medical profession to physicians that are trained and qualified by national standards. It is intended as an assurance to patients and as a safeguard against charlatans that practice inadequate medicine for personal gain. While the laws generally require medical doctors to be trained in "evidence based", Western, or Hippocratic Medicine, they are not intended to discourage different paradigms of health. Doctors who are negligent or intentionally harmful in their care of patients can face charges of medical malpractice & be subject to civil, criminal, or professional sanctions.

Exercise 14. Read the passage and title it.

The Catholic social theorist Ivan Illich subjected contemporary western medicine to detailed attack in his Medical Nemesis, first published in 1975. He argued that the medicalization in recent decades of so many of life's vicissitudes – birth and death, for example – frequently caused more harm than good and rendered many people in effect lifelong patients. He marshalled a body of statistics to show what he considered the shocking extent of post-operative side-effects and drug-induced illness in advanced industrial society. He was the first to introduce to a wider public the notion of iatrogenesis. Others have since voiced similar views, but none so trenchantly, perhaps, as Illich.

Through the course of the 20th century, healthcare providers focused increasingly on the technology that was enabling them to make dramatic improvements in patients' health.

The ensuing development of a more mechanistic, detached practice, with the perception of an attendant loss of patient-focused care, known as the medical model of health, led to criticisms that medicine was neglecting a holistic model. The inability of modern medicine to properly address some common complaints continues to prompt many people to seek support from alternative medicine.

Although most alternative approaches lack scientific validation, some, notably acupuncture for some conditions and certain herbs, are backed by evidence. Medical errors and overmedication are also the focus of complaints and negative coverage. Practitioners of human factors engineering believe that there is much that medicine may usefully gain by emulating concepts in aviation safety, where it is recognized that it is dangerous to place too much responsibility on one "superhuman" individual and expect him or her not to make errors.

Reporting systems and checking mechanisms are becoming more common in identifying sources of error and improving practice. Clinical versus statistical, algorithmic diagnostic methods were famously examined in psychiatric practice in a 1954 book by Paul E. Meehl, which controversially found statistical methods superior.

A 2000 meta-analysis comparing these methods in both psychology and medicine found that statistical or "mechanical" diagnostic methods were generally, although not always, superior. Disparities in quality of care given are often an additional cause of controversy. For example, elderly mentally ill patients received poorer care during hospitalization in a 2008 study. Rural poor African-American men were used in a study of syphilis that denied them basic medical care.

Exercise 15. Analyze the information, which is in the highlight, and use it in practice.

Exercise 16. Answer the questions.

1. Who subjected contemporary western medicine to detailed attack? Where did he do it? 2. What did he argue there? 3. What did he marshal? 4. Was he was the first to introduce to a wider public the notion of iatrogenesis? 5. What did healthcare providers focuse increasingly on through the course of the 20th century? 6. What led to criticisms that medicine was neglecting a holistic model? 7. What continues to prompt many people to seek support from alternative medicine? 8. Why do most alternative approaches lack scientific validation? 9. What is the focus of complaints and negative coverage? 10. What do practitioners of human factors engineering believe? 11. What was famously examined in psychiatric practice in a 1954 book by Paul E. Meehl? 12. Who controversially found statistical methods superior? 13. What is an additional cause of controversy? 14. Who received poorer care during hospitalization in a 2008 study?

Exercise 17. Define the notion «specialties».

In the broadest meaning of "medicine", there are many different specialties. However, within medical circles, there are two broad categories: "Medicine" and "Surgery." "Medicine" refers to the practice of non-operative medicine, and most subspecialties in this area require preliminary training in "Internal Medicine". "Surgery" refers to the practice of operative medicine, and most subspecialties in this area require preliminary training in "General Surgery." There are some specialties of medicine that do not fit into either of these categories, such as radiology, pathology, or anesthesia, and those are also discussed further below.

Exercise 18. Translate the words and phrases into Russian drawing up sentences with them.

Medicinal, medicinal (agent, cotton, preparation, substance, treatment) herbs, medicine man, medicinally, medicine lodge, medico, allopathic physician, homeopathic physician, osteopathic physician, practicing physician, attending physician, family physician, house physician, therapeutist, physicians heal themselves, general practitioner, medico-legal, medico-legal standard, medicobiologic, medico-genetic, medicolegal autopsy, medicolegal investigation.

Exercise 19. Write out all the phrases belonging to the field of medical equipment.

MEDICAL EQUIPMENT

Medical equipment is designed to aid in the diagnosis, monitoring or treatment of medical conditions. These devices are usually designed with rigorous safety standards. The *medical equipment* is included in the category "Medical technology". There are several basic types:

- Diagnostic equipment includes medical imaging machines, used to aid in diagnosis. Examples are ultrasound and MRI machines, PET and CT scanners, and x-ray machines.
- Therapeutic equipment includes infusion pumps, medical lasers and LASIK surgical machines.
- Life support equipment is used maintain a patient's bodily function: medical ventilators, anaesthetic machines, heart-lung machines, ECMO, and dialysis machines.
- Medical monitors allow medical staff to measure a patient's medical state. Monitors may measure patient vital signs and other parameters including ECG, EEG, blood pressure, and dissolved gases in the blood.
- Medical laboratory equipment automates or helps analyze blood, urine and genes.
- Diagnostic Medical Equipment may also be used in the home for certain purposes, e.g. for the control of diabetes mellitus. A biomedical equipment technician (BMET) is a vital component of the healthcare delivery system. Employed primarily by hospitals, BMETs are the people responsible for maintaining a facility's medical equipment. **Inventions:**

- 1895, X-ray, by Wilhelm Röntgen.
- 1903, electrocardiograph, by Willem Einthoven.
- 1956, endoscope, by Basil Hirschowitz.
- 1958, ultrasound scan, by Ian Donald.
- 1973, CT (CAT) scan, by Godfrey Hounsfield and Allan Cormack.
- 1982, artificial heart, by Robert Jarvik.

Exercise 1. Render the score of medical sociology.

Medical sociology involves the sociological analysis of medical organizations and institutions; the production of knowledges and selection of methods, the actions and interactions of healthcare professionals, and the social or cultural (rather than clinical or bodily) effects of medical practice.

The field commonly interacts with the sociology of knowledge, science and technology studies, and social epistemology. Medical sociologists are also interested in the qualitative experiences of patients, often working at the boundaries of public health, social work, demography and gerontology to explore phenomena at the intersection of the social and clinical sciences. Health disparities commonly relate to typical categories such as class and race. Objective sociological research findings quickly become a normative and political issue.

Early work in medical sociology was conducted by Lawrence J Henderson whose theoretical interests in the work of Vilifredo Pareto inspired Talcott Parsons interests in social systems theory.

Parsons is one of the founding fathers of medical sociology, and applied social role theory to interactional relations between sick people and others. Key contributors to medical sociology since the 1950s include H. Becker, M. Bury, P. Conrad, J. Douglas, D. Silverman, P. Strong, B. Pescosolido, C. May, J. W. Schnieder, A. Rogers, A. Strauss, R. Fox, and T. Szasz. The field of medical sociology is usually taught as part of a wider sociology, clinical psychology or health studies degree course, or on dedicated Master's degree courses where it is sometimes combined with the study of medical ethics/bioethics. In Britain, sociology was introduced into the medical curriculum folowing the Goodenough report in 1944: "In medicine, "social explanations" of the aetiology of disease meant for some doctors a redirection of medical thought from the purely clinical and psychological criteria of illness. The introduction of "social" factors into medical explanation was most strongly evidenced in branches of medicine closely related to the community – Social Medicine and, later, General Practice."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WHAT IS PHARMACOGNOSY LIKE?

Pharmacognosy is the study of medicines derived from natural sources. The American Society of Pharmacognosy defines pharmacognosy as "the study of the physical, chemical, biochemical and biological properties of drugs, drug substances or potential drugs or drug substances of natural origin as well as the search for new drugs from natural sources". The word "pharmacognosy" is derived from the Greek words *pharmakon* (drug), and *gnosis* or "knowledge". The term "pharmacognosy" was used for the first time by the Austrian physician Schmidt in 1811.

Originally – during the 19th century and the beginning of the 20th century – "pharmacognosy" was used to define the branch of medicine or *commodity sciences* ("Warenkunde" in German) which deals with drugs in their crude, or unprepared, form. Crude drugs are the dried, unprepared material of plant, animal or mineral origin, used for medicine. The study of these materials under the name *pharmakognosie* was first developed in German-speaking areas of Europe, while other language areas often used the older term "*materia medica*" taken from the works of Galen and Dioscorides.

In German the term "*drogenkunde*" ("science of crude drugs") is also used synonymously.

Although most pharmacognostic studies focus on plants and medicines derived from plants, other types of organisms are also regarded as pharmacognostically interesting, in particular, various types of microbes (bacteria, fungi, etc.), and, recently, various marine organisms. Pharmacognosy is interdisciplinary, drawing on a broad spectrum of biological and socio-scientific subjects, including botany, ethnobotany, medical anthropology, marine biology, microbiology, herbal medicine, chemistry, biotechnology, phytochemistry, pharmacology, pharmaceutics, clinical pharmacy and pharmacy practice. The contemporary study of pharmacognosy can be divided into the fields of

- *Medical ethnobotany*: the study of the traditional use of plants for medicinal purposes.
- *Ethnopharmacology*: the study of the pharmacological qualities of traditional medicinal substances.
- *The study of phytotherapy* (the medicinal use of plant extracts).
- *Phytochemistry*, the study of chemicals derived from plants (including the identification of new drug candidates derived from plant sources).
- *Zoopharmacognosy*, the process by which animals self-medicate, by selecting and using plants, soils, and insects to treat and prevent disease.
- *Pharmcognosy-Biotechnology*, the synthesis of natural bioactive molecules using biotechnology.
- Herbal interactions, the interactions of herbs with other drugs and body.
- Marine Pharmacognosy, the study of chemicals derived from marine organisms.

The word Pharmacognosy had its debut in the early 19th century to designate the discipline related to medicinal plants, it is derived from the Greek word pharmakon meaning "a drug" and gnosco meaning "to acquire a knowledge" and as recorded by Dr. K Ganzinger. Pharmacognosy appears again in 1815 in a small work by Crr. Anotheus ssedler entitled Analecta Pharmacognostica.

Pharmacognosy is closely related to botany and plant chemistry and indeed, both originated from the earlier scientific studies of medicinal plants. As the late as the beginning of the 20th century, the subject had developed mainly in the botanical side, being concerned with the description and identification of drugs. Both in the whole state and in porodler, and with their history.

Commerce, collection, preparation, and storage. Such branches of pharmacognosy are still of fundamental importance, particularly for pharmacopoeial identification and quality control purposes, but rapid development in other areas has enormously expanded the subject.

At the 9th congress of Italian society of pharmacognosy it was stated that current return of phyto-therapy was clearly reflected by the increased market of such products. In the US, where the use of herbal products has never been as prevalent as in continental Europe, the market for all herb sales reached a peak in 1998 of $700 billion. This welcomed the scientific investigation of a rigorous nature.The plant kingdom still holds many species of plants containing substances of medicinal value.

ETHNOPHARMACOLOGY

When studying the effectiveness of herbal medicines and other nature-derived remedies, information on the traditional uses of certain extracts or even extract combinations plays a key role.

The lack of studies proving the use of herbs in traditional care is especially an issue in the United States, where treatment with herbal medicine has fallen out of use since the Second World War. Herbal medicine has also been considered suspect since the Flexner Report of 1910 led to the closing of the eclectic medical schools where botanical medicine was exclusively practiced.

This situation is further complicated by most herbal studies in the latter part of the 20th Century having been published in languages other than English such as German, Dutch, Chinese, Japanese, Korean and Persian. As it may be more difficult to review foreign language publications, much of the relevant information may be unavailable to English speaking scholars.

Some of the important botanicals have been incorporated into the U.S. Food and Drug Administration (FDA) determinations of drug safety. In 1994, US Congress passed the Dietary Supplement Health and Education Act (DSHEA), regulating labeling and sales of herbs and other supplements.

Most of the 2000 US companies making herbal or natural products choose to market their products as food supplements that do not require substantial testing. The part of pharmacognosy focusing on use of crude extracts or semi-pure mixtures originating from nature, namely phytotherapy, is probably the best known and also the most debated area in pharmacognosy. Although phytotherapy is sometimes connected to alternative medicine, when critically conducted, it may be considered the scientific study on the effects and clinical use of herbal medicines.

One characteristic of crude drug material is that constituents may have an opposite, moderating or enhancing effect. Hence, the final effect of any crude drug material will be a product of the interactions between the constituents and the effect of each constituent on its own. To effectively study the existence and affect of such interactions, scientific studies must examine the affect that multiple constituents, given concurrently, have on the system. Herbalists assert that as phytopharmaceuticals rely upon synergy for their activities, plants with high levels of active constituents like ginsenosides or hypericin may not correlate with the strength of the herbs.

In phytopharmaceutical or herbal medicine, the therapeutic effects of herbs cannot be determined unless its active ingredient or cofactors are identified or the herb is adminsistered as a whole. One way manufacturers have attempted to indicate strength is to engage in standardization to a marker compound. Companies use different markers, or different levels of the same markers, or different methods of testing for marker compounds. Many herbalists believe that the active ingredient in a plant is the plant itself. The Sloan Kettering Memorial Cancer Center stated, in a review of a juice product, which had been marketed as preventing cancer that antioxidants could theoretically interfere with chemotherapy. A recent review of the effect of antioxidants on chemotherapy, however, found no evidence for any deleterious effects of antioxidants on chemotherapy.

A study of herb drug interactions indicated that the vast majority of drug interactions occurred in four classes of drugs, the chief class being blood thinners, but also including protease inhibitors, cardiac glycosides and the immuno-suppressant ciclosporin.

Exercise 1. Explain the notion "Pharmacognosy" after reading the text below.

Exercise 2. Explain the essentials of ethnopharmacology.

Exercise 3. Answer the questions.

1. What plays a key role when studing the effectiveness of herbal medicines? 2. What is an issue in the USA? 3. When has treatment with herbal medicine fallen out of use? 4. What languages were most herbal studies published? 5. How do most USA companies market their herbal products? 6. What is one characteristic of crude drug material? 7. What do manufacturers do to indicate strength of herbal medicine? 8. What does a study of herb drug interactions indicate?

Exercise 4. Explain the reason of biodiversity loss.

Farnsworth for example, has found that 25% of all prescriptions dispensed from community pharmacies in the USA from 1959 to 1980 contained active ingredients extracted from higher plants. In some countries in Asia and Africa 80% of the population relies on traditional medicine (including herbal medicine) for primary health care. Constituents of substances used by traditional healers have rarely been incorporated into modern medicine.

Knowledge of traditional medicinal practices is fast disappearing, particularly in the Amazon, as native healers die out and are replaced by more modern medical practitioners.

Botanists and pharmacologists are racing to learn these ancient practices which, like the forest plants they employ, are also endangered. An explanation for some species loss is habitat lost due to invasive species introduction. Herbalist David Winston has suggested that a high proportion of nonnative species seen as invasive (kudzu, Japanese knotweed, mimosa, lonicera, St. Johnswort and purple loosestrife) may be harvested for the domestic herbal medicine market.

Species extinction is not only due to habitat loss. Overharvesting of medicinal species of plants and animals also contributes to species loss. This is particularly notable in the matter of Traditional Chinese Medicine where crude drugs of plant and animal origin are used with increasing demand. People with a stake in TCM often seek chemical and biological alternatives to endangered species because they realize that plants and animals lost from the wild are also lost to medicine forever but different cultural attitudes bedevil conservation efforts.

Still conservation is not a new idea: Chinese advice against overexploitation of natural medicinal species dates from at least Mencius, a philosopher living in the 4th century B.C.

Cooperation between western conservationists and practitioners has been beset by cultural difficulties. Westerners may emphasise urgency in matters of conservation, while Chinese may wish for the products used in TCM to remain publicly available. One repeated fallacy is that rhinoceros horn is used as an aphrodisiac in TCM. It is, in fact, prescribed for fevers and convulsions by TCM practitioners. There are no peer-reviewed studies showing that this treatment is effective.

In 1995 representatives of the oriental medicine communities in Asia met with conservationists at a symposium in Hong Kong, organized by TRAFFIC. The two groups established a clear willingness to cooperate through dialogue and mutual understanding.

This has led to several meetings, including the 1997 First International Symposium on endangered species used in Traditional East Asian Medicine where China was among 136 nations to sign a formal resolution recognizing that the uncontrolled use of wild species in traditional medicine threatens their survival and the continuation of these medical practices. The resolution, drawn up by the UN Convention on International Trade in Endangered Species (CITES), aims to initiate new partnerships in conservation.

Exercise 5. Translate the words and phrases into Russian drawing up sentences with them.

Herb, medicinal herbs, herbage, no herb will cure love, herbal, herbal remedy, herb meadow, herb tea, herbaceous vegetation, kar herbage, tall herbage, herbalism, herbalist, herbarium, herbaceous, herbaceous plant, aromatic herbs, medicinal herbs, a herb garden, herbage, kar herbage, tall herbage, forage herbs, rich herbs, herb (grass) meadow, herb tea, no herb will cure love, herbaceous, herbaceous vegetation, herbal, herbal remedy, herbary, herbed, herbicide, herbivore, to herborize.

Exercise 6. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 7. Render the sustainable sources of plant and animal drugs.

As species face loss of habitat or overharvesting, there have been new issues to deal with in sourcing crude drugs. These include changes to the herb from farming practices, substitution of species or other plants altogether, adulteration and cross-pollination issues.

For instance, ginseng which is field farmed may have significant problems with fungus, making contamination with fungicides an issue. This may be remedied with woods grown programs, but they are insufficient to produce enough ginsengs to meet demand. The wildcrafted echinacea, black cohosh and American ginseng often rely upon old growth root, often in excess of 50 years of age and it is not clear that younger stock will have the same pharmaceutical effect. Black cohosh may be adulterated with the related Chinese actea species, which is not the same. Ginseng may be replaced by ginseniodes from Jiaogulan which has been stated to have a different effect than the full panax root.

The problem may be exacerbated by the growth of pills and capsules as the preferred method of ingesting medication as they are cheaper and more available than traditional, individually tailored prescriptions of raw medicinals but the contents are harder to track. Seahorses are a case in point.

Seahorses once had to be of a certain size and quality before they were accepted by practitioners and consumers. But declining availability of the preferred large, pale and smooth seahorses has been offset by the shift towards prepackaged medicines, which make it possible for TCM merchants to sell previously unused juvenile, spiny and dark-coloured animals. Today almost a third of the seahorses sold in China are prepackaged.

The farming of plant or animal species, used for medicinal purposes has caused difficulties. Rob Parry Jones and Amanda Vincent write: "One solution is to farm medicinal animals and plants".

Chinese officials have promoted this as a way of guaranteeing supplies as well as protecting endangered species. And there have been some successes – notably with plant species, such as American ginseng – which is used as a general tonic and for chronic coughs. Red deer, too, have for centuries been farmed for their antlers, which are used to treat impotence and general fatigue.

But growing your own is not a universal panacea. Some plants grow so slowly that cultivation in not economically viable. Animals such as musk deer may be difficult to farm, and so generate little profit. Seahorses are difficult to feed and plagued by disease in captivity. Other species cannot be cultivated at all. Even when it works, farming usually fails to match the scale of demand. Overall, cultivated TCM plants in China supply less than 20 % of the required 1.6 million tonnes per annum.

Similarly, China's demand for animal products such as musk and pangolin scales far exceeds supply from captive-bred sources. Farming alone can never resolve conservation concerns, as government authorities and those who use Chinese medicine realise. For a start, consumers often prefer ingredients taken from the wild, believing them to be more potent. This is reflected in the price, with wild oriental ginseng fetching up to 32 times as much as cultivated plants. Then there are welfare concerns. Bear farming in China is particularly controversial. Around 7600 captive bears have their bile "milked" through tubes inserted into their gall bladders. The World Society for the Protection of Animals states that bear farming is surrounded by "appalling levels of cruelty and neglect".

Chinese officials state that 10 000 wild bears would need to be killed each year to produce as much bile, making bear farming the more desirable option.

Exercise 8. Read the article and answer the question: Modern medicine? It's not so modern!

Many basic principles of modern medicine and hygiene were revealed in the Bible thousands of years before they were discovered by modern science. The earliest evidence we have of public health and sanitary practices is found in the first five books of the Bible, the Pentateuch. In these writings, the Israelites were instructed to isolate, and if necessary quarantine, those who were sick. They were to destroy contaminated objects, to burn used dressings, and to bury fecal waste outside of the camp.

The Israelites were prohibited from eating animals which had died of natural causes. They were also admonished to practise personal hygiene by hand-washing and keeping clean, and to take certain precautions when touching the infected or deceased.

"When any man hath a running issue out of his flesh, because of his issue he is unclean. Every bed, whereon he lieth is unclean. And whosoever toucheth his bed shall wash his clothes, and bathe himself in water. And if he that hath the issue spit upon him that is clean; then he shall wash his clothes, and bathe himself in water. And whomsoever he toucheth that hath the issue, and hath not rinsed his hands in water, he shall wash his clothes, and bathe himself in water."

These same regulations applied to a woman for a specific number of days following childbirth.

Furthermore, it was clearly forbidden for the Israelites to engage in any sexual relationships outside of marriage. Sexually transmitted diseases today would virtually disappear if sexual activity were confined to marriage, consisting of the biblical plan of one husband and one wife.

Exercise 9. Explain the title «Enjoy great health».

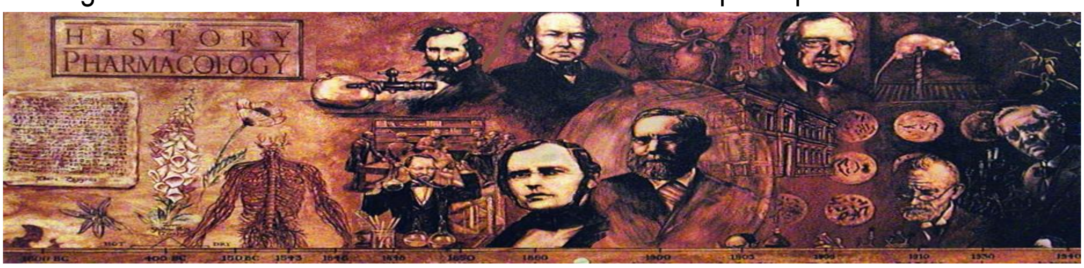
The Israelites believed that God, through Moses, had given his people a set of instructions. If they obeyed, they would enjoy great health. If they disobeyed, they would not. "If thou wilt diligently hearken to the voice of the Lord thy God ... I will put none of these diseases upon thee."

It is generally accepted that modern medical science came about in 1876 when Louis Pasteur and Robert Koch demonstrated (almost simultaneously and unknown to each other) the idea that contagion passes from one individual to another. The discoveries made by these men, however, were ignored and even scornfully rejected by virtually the entire medical establishment of their day.

Medical scientists and practising physicians fiercely defended the age-old Greek philosophy that microbial life could be generated *de novo* under certain conditions.

Exploud the title «Life comes only from life».

Millions of people today are living happy and healthy lives because of health and sanitary procedures encouraged by such people as Louis Pasteur. Through careful experimentation, Pasteur and Koch were able to demonstrate irrefutably that even the simplest of living things did not arise spontaneously from non-living matter. More importantly, Koch proved that particular kinds of microbes were responsible for particular kinds of maladies. While presenting his ingenious "swan-neck flask" experiment, Pasteur spoke triumphantly: "I have taken my drop of water from the immensity of creation, and I have taken it full of the elements appropriate to the development of microscopic organisms. And I wait, I watch, I question it! – begging it to recommence for me the beautiful spectacle of the first creation. "But it is dumb, dumb since these experiments were begun several years ago; it is dumb because I have kept it sheltered from the only thing man does not know how to produce; from the germs which float in the air, from Life, for Life is a germ and a germ is Life. Never will the doctrine of spontaneous generation recover from the mortal blow of this simple experiment!"



Exercise 11. Describe the evolution myth.

Louis Pasteur, a deeply religious man, had demonstrated that life arose from life. His experiments dealt a devastating blow to the evolutionary myth that life arose from non-living matter – a belief still held by evolutionists today. The refutation of spontaneous generation, and the establishment of the germ concept of disease, was one of the greatest contributions ever made to the saving of human lives. Had this not been done, physicians might still be devoting their efforts towards combating disease-producing organisms that were thought to have arisen spontaneously from within the patient's body. Today, physicians know that pathogens do not arise spontaneously, but are the descendants of parent organisms that were originally transmitted from outside the body.

Equipped with this evidence, Pasteur and others prevailed on surgeons and medical practitioners to adopt health and sanitary procedures that are strikingly similar to those recorded in the Pentateuch 4,000 years earlier. The results were spectacular. Millions of lives have been saved.

Exercise 12. Define modern medicine in the Bible.

It is clear that the facts of modern medicine agree marvellously with the Bible. For example, the Mosaic regulations pertaining to childbirth, sexual relationships, hand-washing, wound and discharge care, quarantining, burial precautions, and waste disposal are examples which indicate that diseases are communicable, and that the best protection against them is to prevent their spread.

In Genesis 1:24 and 25 we read that God commanded all living things to reproduce "after their kind". Preventive medicine becomes possible with the knowledge of this truth alone! As has been said, although the Bible is not a science text, whenever it speaks of scientific matters it speaks truly and accurately. The explanation of this phenomenon is that the Bible is what it claims to be: *the inspired Word of God.* What is certain in any case is that no constructive progress in medicine was possible until the ancient evolutionary doctrine of spontaneous generation was discarded.

The fierce battle to destroy this superstitious myth regarding the origins of microscopic life is surely one of the most exciting sagas in the long development of modern medicine. The average life span of human beings has improved considerably in the last century, thanks to the progress of medical technology. Medical inventions have not only paved the way for improved diagnostic techniques, but also manipulation of chemicals and minerals to cure the human body of many ailments.

Medical innovations have led to the complete eradication of dangerous diseases like small pox.

The latest medical research is focused on inventing a cure for dangerous and fatal diseases like AIDS and cancer that have already claimed the lives of many. New curative or preventive medicines for such diseases will be a major break through in medical technology. There are many drug companies that fund as well as aid in research and development for new medical inventions.

Scientists and inventors with credible theories are also encouraged by governments of all nations to carry on research to come up with new medical techniques in diagnosis and treatment as well as new medical cures and drugs. There are also corporations and companies that help inventors and physicians to put their innovative ideas into practice and develop new medical devices and healthcare products. Such companies also help to market the new products once they are ready for use. For example, an ingenious medical invention was developed by Dr. Clyde Morgan with the help of Eureka Medical, a company that offers services to people with innovative ideas in medicine. He developed a new type of non-invasive treatment to control symptoms of Carpal Tunnel Syndrome.

Few of these symptoms include loss of hand grip strength, interruption of sleep due to numbness in hands and aching shoulders and neck. The device helped patients to be in control of the symptoms and go back to sound sleep during nights. The device, to be worn at night, comes with a solution that helps to keep routine sleep interruption in check.

Exercise 13. Analyze the information, which is in the highlight, and use it in practice.

Exercise 14. Make up some dialogues from the information above.

Exercise 15. Explain the notion "Disaster medicine".

Disaster medicine is the area of physician medical specialization serving the dual areas of providing medical care to disaster survivors and providing medically related disaster preparation, disaster planning, disaster response and disaster recovery leadership throughout the disaster life cycle. Disaster Medicine specialists provide insight, guidance and expertise on the principles and practice of medicine both in the disaster impact area and healthcare evacuation receiving facilities to emergency management professionals, hospitals, healthcare facilities, communities and governments.

The Disaster Medicine specialist is the liaison between and partner to the medical contingency planner, the emergency management professional, the incident command system, government and policy makers. Disaster Medicine is unique among the medical specialties in that unlike all other areas of specialization, the Disaster Medicine specialist does not practice the full scope of the specialty everyday. Indeed, the Disaster Medicine hopes to never practice the full scope of skills required for board certification. However, like the specialists in public health, environmental medicine and occupational medicine. Disaster Medicine specialists engage in the development and modification of public and private policy, legislation, disaster planning and disaster recovery.

Exercise 16. Analyze the information and render the main idea of it briefly in English.

The term "disaster medicine" first appeared in the medical lexicon in the post World War II era.

Although coined by former and current military physicians who had served in World War II, the term grow out of a concern for the need to care for military casualties, or nuclear holocaust victims but out of the need to provide care to the survivors of natural disasters and the not yet distant memory of the 1917-1918 Influenza Pandemic. The term "disaster medicine" would continue to appear sporadically in both the medical and popular press until the 1980's when the first concerted efforts to organize a medical response corps for disasters grew into the National Disaster Medical System.

Simultaneous with this was the formation of a disaster and emergency medicine discussion and study group under the American Medical Association (AMA) in the United States as well as groups in Great Britain, Israel and other countries. By the time hurricane Andrew struck Florida in 1992, the concept of Disaster Medicine was entrenched in public and governmental consciousness.

Although training and fellowships in Disaster Medicine or related topics began graduating specialists in the Europe and the United States as early as the 1980's, it would not be until 2003 however that the medical community would embrace the need for the new specialty. Throughout this period, incomplete and faltering medical responses to disaster events made it increasingly apparent in the USA that federal, state and local emergency management organizations were in need of a mechanism to identify qualified physicians in the face of a global upturn in the rate of disasters.

Many physicians who volunteer at disasters have a bare minimum of knowledge in disaster medicine and often pose a hazard to themselves and the response effort because they have little or no field response training. It was against this backdrop that the American Academy of Disaster Medicine (AADM) and the American Board of Disaster Medicine (ABODM) were formed in the USA of America for the purpose of scholarly exchange and education in Disaster Medicine as well as the development of an examination demonstrating excellence towards board certification in this new specialty.

Physicians who hold board certification in Disaster Medicine have demonstrated by written and simulator based examination that through training and field experience they have mastered the spectrum of knowledge and skills which defines the specialty of Disaster Medicine.

As with all medical specialties, this body of knowledge and skills is contained in the core competencies document created and maintained by the American Board of Disaster Medicine and the American Academy of Disaster Medicine. As with all core competencies document, the specific knowledge and skills required for certification are subject to constant refinement and evolution. This statement cannot be truer than for a specialty like Disaster Medicine where the nature of the threats faced, the responses undertaken and the lessons learned become more complex with each event.

Exercise 17. Give the definitions of some notions.

Disaster healthcare. The provision of healthcare services by healthcare professionals to disaster survivors and disaster responders both in a disaster impact area and healthcare evacuation receiving facilities throughout the disaster life cycle.

Disaster behavioral health. Disaster Behavioral Health deals with the capability of disaster responders to perform optimally, and for disaster survivors to maintain or rapidly restore function, when faced with the threat or actual impact of disasters and extreme events.

Disaster law. Disaster Law deals with the legal ramifications of disaster planning, preparedness, response and recovery, including but not limited to financial recovery, public and private liability, property abatement and condemnation.

Disaster life cycle. The time line for disaster events beginning with the period between disasters (Interphase), progressing through the disaster event and the disaster response and culminating in the disaster recovery. Interphase begins as the end of the last disaster recovery and ends at the onset of the next disaster event. The disaster event begins when the event occurs and ends when the immediate event subsides. The disaster response begins when the event occurs and ends when acute disaster response services are no longer needed. Disaster recovery also begins with the disaster response and continues until the affected area is returned to the pre-event condition.

Disaster planning. The act of devising a methodology for dealing with a disaster event, especially one with the potential to occur suddenly and cause great injury and/or loss of life, damage and hardship. Disaster planning occurs during the disaster interphase.

Disaster preparation. The act of practicing and implementing the plan for dealing with a disaster event before and event occurs, especially one with the potential to occur suddenly and cause great injury and/or loss of life, damage and hardship. It occurs during the disaster interphase.

Disaster recovery. The restoration or return to the former or better state or condition preceding a disaster event (i.e., status quo ante, the state of affairs that existed previously). Disaster recovery is the fourth phase of the disaster life cycle.

Disaster response. The ability to answer the intense challenges posed by a disaster event. Disaster response is the third phase of the disaster life cycle.

Medical contingency planning. The act of devising a methodology for meeting the medical requirements of a population affected by a disaster event.

Medical surge. An influx of patients (physical casualties and psychological casualties), bystanders, visitors, family members, media and individuals searching for the missing who present to a hospital or healthcare facility for treatment, information and/or shelter as a result of a disaster.

Surge capacity. The ability to manage a sudden, unexpected increase in patient volume that would otherwise severely challenge or exceed the current capacity of the health care system.

Medical triage. The separation of patients based on severity of injury or illness in light of available resources.

Psychosocial triage. The separation of patients based on the severity of psychological injury or impact in light of available resources.

Exercise 17. Summarize your findings on disaster medicine and issue in a short presentation.

UNIT III. ALTERNATIVE MEDICINE

INTRODUCTION

The term "*alternative medicine*", as used in the modern western world, encompasses any healing practice "that does not fall within the realm of conventional medicine".

Commonly cited examples include naturopathy, chiropractic, herbalism, traditional Chinese medicine, Unani, Ayurveda, meditation, yoga, biofeedback, hypnosis, homeopathy, acupuncture, and diet-based therapies, in addition to a range of other practices. It is frequently grouped with *complementary medicine*, which generally refers to the same interventions when used in conjunction with mainstream techniques, under the umbrella term complementary and alternative medicine, or CAM.

Some significant researchers in alternative medicine oppose this grouping, preferring to emphasize differences of approach, but nevertheless use the term "CAM", which has become standard.

Alternative medicine practices are as diverse in their foundations as in their methodologies.

Practices may incorporate or base themselves on traditional medicine, folk knowledge, spiritual beliefs, or newly conceived approaches to healing. Jurisdictions where alternative medical practices are sufficiently widespread may license and regulate them. The claims made by alternative medicine practitioners are generally not accepted by the medical community because evidence-based assessment of safety and efficacy is either not available or has not been performed for many of these practices.

If scientific investigation establishes the safety and effectiveness of an alternative medical practice, it may be adopted by conventional practitioners.

Because alternative techniques tend to lack evidence, some have advocated defining it as non-evidence based medicine, or not medicine at all. Some researchers state that the evidence-based approach to defining CAM is problematic because some CAM is tested, and research suggests that many mainstream medical techniques lack solid evidence. A 1998 systematic review of studies assessing its prevalence in 13 countries concluded that about 31% of cancer patients use some form of complementary and alternative medicine. Alternative medicine varies from country to country.

Dr. Edzard Ernst believes that in Austria and Germany CAM is mainly in the hands of physicians, while some estimates suggest that at least half of American alternative practitioners are physicians. In Germany, herbs are tightly regulated, with half prescribed by doctors and covered by health insurance based on their Commission E legislation.

General Terms

There is no clear and consistent definition as to the exact nature of alternative or complementary medicines. In a 2005 report entitled *Complementary and Alternative Medicine in the United States* the Institute of Medicine (IOM) adopted this definition: "Complementary and Alternative Medicine (CAM) is a broad domain of resources that encompasses health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the dominant health system of a particular society or culture in a given historical period. CAM includes such resources perceived by their users as associated with positive health outcomes. Boundaries within CAM and between the CAM domain and the domain of the dominant system are not always sharp or fixed." Other groups and individuals have offered various definitions and distinguishing characteristics.

The National Center for Complementary and Alternative Medicine (NCCAM) defines CAM as "a group of diverse medical and health care systems, practices, and products, that are not currently part of conventional medicine." NCCAM has developed what the IOM calls "one of the most widely used classification structures"for the branches of complementary and alternative medicine.

The Cochrane Complementary Medicine Field says: "What are considered complementary or alternative practices in one country may be considered conventional medical practices in another.

Therefore, our definition is broad and general: complementary medicine includes all such practices and ideas which are outside the domain of conventional medicine in several countries and defined by its users as preventing or treating illness, or promoting health and well-being.

These practices complement mainstream medicine by

- contributing to a common whole;
- satisfying a demand not met by conventional practices;
- diversifying the conceptual framework of medicine."

David M. Eisenberg defines it as "medical interventions not taught widely at US medical schools or generally available at US. Hospitals," while Richard Dawkins sardonically defines it as a "set of practices which cannot be tested, refuse to be tested, or consistently fail tests."

The term "alternative medicine" is generally used to describe practices used independently or in place of conventional medicine. The term "complementary medicine" is primarily used to describe practices used in conjunction with or to complement conventional medical treatments.

NCCAM suggests "using aromatherapy therapy in which the scent of essential oils from flowers, herbs, and trees is inhaled in an attempt to promote health and well-being and to help lessen a patient's discomfort following surgery" as an example of complementary medicine.

The terms "integrative" or "integrated medicine" indicate combinations of conventional and alternative medical treatments which have some scientific proof of efficacy; such practices are viewed by advocates as the best examples of complementary medicine.

Ralph Snyderman and Andrew Weil state that "integrative medicine is not synonymous with complementary and alternative medicine. It has a far larger meaning and mission in that it calls for restoration of the focus of medicine on health and healing and emphasizes the centrality of the patient-physician relationship." The combination of orthodox and complementary medicine with an emphasis on prevention and lifestyle changes is known as integrated medicine.

Relation to Evidence-based Medicine

Some scientists reject the use of the classification of any therapy as "alternative medicine" on the grounds that "there is only medicine that has been adequately tested and medicine that has not, medicine that works and medicine that may or may not work." These scientists advocate a classification based on scientific evidence, and state that "what most sets alternative medicine apart, in our view, is that it has not been scientifically tested and its advocates largely deny the need for such testing."

The US Institute of Medicine analyzed this approach to defining alternative medicine, which it called normative, and found it problematic because some CAM is tested, and much of mainstream medicine lacks strong evidence. The IOM found that in a study of 160 Cochrane systematic reviews of mainstream techniques, 20% were ineffective and 21% had insufficient evidence.

The IOM therefore defined alternative medicine broadly as the nondominant approach in a given culture and historical period.

Exercise 1. Answer the questions.

1. How many groups are there in NCCAM classifications? 2. Can you define them shortly? 3. What is energy medicine like? 4. How can you describe contemporary use of alternative medicine? 5. Why do many people utilize mainstream medicine? 6. What facts do contemporary studies indicate? 7. Who is a leading proponent of integrative medicine? 8. How well are the matters in this field in the USA? 9. What change is known as integrated medicine? 10. Why do some scientists reject the use of the classification of any therapy as "alternative medicine"? 11. What do they advocate? 12. What does the US Institute of Medicine analyze? 13. What are the best examples of complementary medicine? 14. What does complementary medicine include?

Exercise 2. Define NCCAM classifications.

NCCAM classifies complementary and alternative therapies into five major groups.

The classification is rather loose, and there can be some overlap.

- **Whole medical systems** cut across more than one of the other groups; examples include Traditional Chinese medicine and Ayurveda.
- **Mind-body medicine** takes a holistic approach to health that explores the interconnection between the mind, body, and spirit. It works under the premise that the mind can affect "bodily functions and symptoms".
- **Biologically based practices** use substances found in nature such as herbs, foods, vitamins, and other natural substances.
- **Manipulative and body-based practices** feature manipulation or movement of body parts, such as is done in chiropractic and osteopathic manipulation.
- **Energy medicine** is a domain that deals with putative and verifiable energy fields:
  - Biofield therapies are intended to influence energy fields that purportedly surround and penetrate the body. No empirical evidence has been found to support the existence of the "putative" energy fields on which these are predicated.
  - Bioelectromagnetic-based therapies use verifiable electromagnetic fields, such as pulsed, alternating-current or direct-current fields in an unconventional manner.

Exercise 3. Explain the contemporary use of alternative medicine.

Many people utilize mainstream medicine for diagnosis and basic information, while turning to alternatives for what they believe to be health-enhancing measures. Studies indicate that alternative approaches are often used in conjunction with conventional medicine. This is referred to by NCCAM as integrative medicine because it "combines treatments from conventional medicine and CAM for which there is some high-quality evidence of safety and effectiveness." According to Andrew T. Weil M.D., a leading proponent of integrative medicine, the principles of integrative medicine include: appropriate use of conventional and CAM methods; patient participation; promotion of health as well as treatment of disease; and a preference for natural, minimally-invasive methods.

A 2007 survey found that 13.7% of respondents in the USA had sought the services of both a medical doctor and an alternative medicine practitioner. The same survey found that 96% of respondents who sought the services of an alternative medicine practitioner also sought the services of a medical doctor in the past 12 months. Medical doctors are often unaware of their patient's use of alternative medical treatments as only 38.5% of the patients alternative therapies were discussed with their medical doctor.

Exercise 4. Translate the words and phrases into Russian drawing up sentences with them.

Test, to draw (make up, set, bear, pass) the (a) test, test in French, to fail a test, minimum competency test, multiple-choice test, proficiency test, achievement test, aptitude test, free-association test, intelligence test, personality test, psychological test, minimum competency test, multiple-choice test, proficiency test, achievement test, aptitude test, to do a blood test, to have a blood test (done), laboratory test, to test smb.'s eyesight, to test a class in algebra, day-to-day test, testing.

Exercise 5. Translate the sentences with the keyword «text».

1. It is a commonplace fact that holidays are a major test of any relationship. 2. The test of any civilized society is how it treats its minorities. 3. They conducted a series of tests on me at the health center. 4. The family doctor ordered numerous, expensive medical tests, which revealed no physical problem. 5. The eyesight of different peoples may test the same, yet some primitive peoples seem to white explorers to see as if they were using binoculars. 6. Working in the new school gave him a chance to test out some of the latest ideas in education. 7. The drug must first be tested in clinical trials to see if it works on other cancers.

COMPLEMENTARY MEDICINE

Edzard Ernst, Professor of Complementary Medicine at the University of Exeter, wrote in the Medical Journal of Australia that "about half the general population in developed countries uses complementary and alternative medicine (CAM)."

Survey results released in May 2008 by the National Center for Complementary and Alternative Medicine, part of the United States National Institutes of Health, found that in 2007 62.1% of adults in the country had used some form of CAM in the past 12 months and 75% across lifespan (though these figure drop to 36.0% and 50% if prayer specifically for health reasons is excluded); this study included yoga, meditation, herbal treatments and the Atkins diet as CAM.

Another study suggests a similar figure of 40%. A British telephone survey by the BBC of 1209 adults in 1998 shows that around 20% of adults in Britain had used alternative medicine in the past 12 months. Ernst has been active politically on this issue as well, publicly requesting that Prince Charles recall two guides to alternative medicine published by the Foundation for Integrated Health, on the grounds that they both contain numerous misleading and inaccurate claims concerning the supposed benefits of alternative medicine" and that "the nation cannot be served by promoting ineffective and sometimes dangerous alternative treatments".

In general, he believes that CAM can and should be subjected to scientific testing. The use of alternative medicine in developed countries appears to be increasing. A 1998 study showed that the use of alternative medicine had risen from 33.8% in 2000 to 42.1% in 2007.

In the United Kingdom, a 2008 report ordered by the House of Lords suggested that "...limited data seem to support the idea that CAM use in the United Kingdom is high and is increasing."

In developing nations, access to essential medicines is severely restricted by lack of resources and poverty. Traditional remedies, often closely resembling or forming the basis for alternative remedies, may comprise primary health care or be integrated into the health care system.

In Africa, traditional medicine is used for 80% of primary health care, and in developing nations as a whole over one third of the population lack access to essential medicines.

Advocates of alternative medicine hold that the various alternative treatment methods are effective in treating a wide range of major and minor medical conditions that recently published research proves the effectiveness of specific alternative treatments. Complementary therapies are often used in palliative care or by practitioners attempting to manage chronic pain in patients.

Complementary medicine is considered more acceptable in the interdisciplinary approach used in palliative care than in other areas of medicine. "From its early experiences of care for the dying, palliative care took for granted the necessity of placing patient values and lifestyle habits at the core of any design and delivery of quality care at the end of life. If the patient desired complementary therapies, and as long as such treatments provided additional support and did not endanger the patient, they were considered acceptable."

The non-pharmacologic interventions of complementary medicine can employ mind-body interventions designed to "reduce pain and concomitant mood disturbance and increase quality of life."

Physicians who practice complementary medicine usually discuss and advise patients as to available complementary therapies. Patients often express interest in mind-body complementary therapies because they offer a non-drug approach to treating some health conditions.

Some mind-body techniques, such as cognitive-behavioral therapy, were once considered complementary medicine, but are now a part of conventional medicine in the USA. "

Complementary medicine treatments used for pain include: acupuncture, low-level laser therapy, meditation, aroma therapy, Chinese medicine, dance therapy, music therapy, massage, herbalism, therapeutic touch, yoga, osteopathy, chiropractic, naturopathy, and homeopathy."

Exercise 1. Analyze %age of adults who used complementary & alternative medicine.

Exercise 2. Make up some dialogues from the information above.

Exercise 3. Define the testing of efficacy.

Many alternative therapies have been tested with varying results. According a 2008 book by a US Institute of Medicine panel, the number of RCTs focused on CAM has risen dramatically. The book cites Vickers (1998), who found that many of the CAM-related RCTs are in the Cochrane register, but 19% of these trials were not in MEDLINE, and 84% were in conventional medical journals.

In 83% of the cases, the readers agreed. In the 17% in which they disagreed, a third reader agreed with one of the initial readers to set a rating. These studies found that for CAM, 38.4% concluded positive effect or possibly positive (12.4%) effect, 4.8% concluded no effect, 0.69% concluded harmful effect, and 56.6% concluded insufficient evidence. An assessment of conventional treatments found that 41.3% concluded positive or possibly positive effect, 20% concluded no effect, 8.1% concluded net harmful effects, and 21.3% concluded insufficient evidence.

However, the CAM review used the 2005 Cochrane database while the conventional review used the 1998 Cochrane database. Most alternative medical treatments are not patentable, which may lead to less research funded by the private sector.

Additionally, in most countries alternative treatments (in contrast to pharmaceuticals) can be marketed without any proof of efficacy – a disincentive for manufacturers to fund scientific research.

Some have proposed adopting a prize system to reward medical research.

However, public funding for research exists. Some skeptics of alternative practices say that a person may attribute symptomatic relief to an otherwise ineffective therapy due to the placebo effect, the natural recovery from or the cyclical nature of an illness (the regression fallacy), or the possibility that the person never originally had a true illness.

In the same way as for conventional therapies, drugs, and interventions, it can be difficult to test the efficacy of alternative medicine in clinical trials. In instances where an established, effective, treatment for a condition is already available, the Helsinki Declaration states that withholding such treatment is unethical in most circumstances. Use of standard-of-care treatment in addition to an alternative technique being tested may produce confounded or difficult-to-interpret results.

Exercise 4. Make up some dialogues from the information above.

Exercise 5. Generate all events which are in the text.

Exercise 6. Write all new words and phrases on the topic.

Exercise 7. Specify public use of CAM in the USA.

A 2008 survey of US adults 18 years and older conducted by the National Center for Health Statistics (CDC) and the National Center for Complementary and Alternative Medicine indicated:

- 74.6% had used some form of complementary and alternative medicine.
- 62.1% had done so within the preceding twelve months.
- When prayer specifically for health reasons is excluded, these figures fall to 49.8% and 36.0%, respectively.
- 45.2% had in the last twelve months used prayer for health reasons, either through praying for their own health or through others praying for them.
- 54.9% used CAM in conjunction with conventional medicine.
- 14.8% "sought care from a licensed or certified" practitioner, suggesting that "most individuals who use CAM prefer to treat themselves."
- Most people used CAM to treat and/or prevent musculoskeletal conditions or other conditions associated with chronic or recurring pain.
- "Women were more likely than men to use CAM. The largest sex differential is seen in the use of mind-body therapies including prayer specifically for health reasons".
- "Except for the groups of therapies that included prayer specifically for health reasons, use of CAM increased as education levels increased".
- The most common CAM therapies were prayer (45.2%), herbalism (18.9%), breathing meditation (11.6%), meditation (7.6%), chiropractic medicine (7.5%), yoga (5.1%), body work (5.0%), diet-based therapy (3.5%), progressive relaxation (3.0%), mega-vitamin therapy (2.8%) and Visualization (2.1%).

The National Science Foundation has also conducted surveys of the popularity of alternative medicine. After describing the negative impact science fiction in the media has on public attitudes and understandings of pseudoscience, and listing alternative medicine as one of many pseudoscientific subjects, as well as mentioning the concerns of individual scientists, organizations, and members of the science policymaking community, it commented that "nevertheless, the popularity of alternative medicine appears to be increasing."

Exercise 8. Read the information on usage of alternative medicine in New Zealand.

In New Zealand alternative medicine products are classified as food products, so there are no regulations or safety standards in place. The production of modern pharmaceuticals is strictly regulated to ensure that medicines contain a standardized quantity of active ingredients and are free from contamination. Alternative medicine products are not subject to the same governmental quality control standards, and consistency between doses can vary.

This leads to uncertainty in the chemical content and biological activity of individual doses.

This lack of oversight means that alternative health products are vulnerable to adulteration and contamination. This problem is magnified by international commerce, since different countries have different types and degrees of regulation. This can make it difficult for consumers to properly evaluate the risks and qualities of given products.

Exercise 9. Transfer the given information from the passages onto a table.

№	Activity			
	Events	**When**	**Where**	**Score**
1.				

MEDICAL EDUCATION

In the USA, increasing numbers of medical colleges have started offering courses in alternative medicine. For example, in three separate research surveys that surveyed 729 schools (125 medical schools offering an MD degree, 25 medical schools offering a Doctor of Osteopathic medicine degree, and 585 schools offering a nursing degree), 60% of the standard medical schools, 95% of osteopathic medical schools and 84.8% of the nursing schools teach some form of CAM.

The University of Arizona College of Medicine offers a program in Integrative Medicine under the leadership of Dr. Andrew Weil which trains physicians in various branches of alternative medicine which "...neither rejects conventional medicine, nor embraces alternative practices uncritically".

Accredited Naturopathic colleges and universities are also increasing in number and popularity in Canada and the USA. Similarly "unconventional medicine courses are widely represented at European universities. They cover a wide range of therapies. Many of them are used clinically.

Research work is underway at several faculties," but "only 40% of the responding European universities were offering some form of CAM training." In contrast to unconventional schools in Britain, no conventional medical schools offer courses that teach the clinical practice of alternative medicine.

The British Medical Acupuncture Society offers medical acupuncture certificates to doctors, as does the College of Naturopathic Medicine UK and Ireland. Due to the uncertain nature of various alternative therapies and the wide variety of claims different practitioners make, alternative medicine has been a source of vigorous debate, even over the definition of alternative medicine. Dietary supplements, their ingredients, safety, and claims, are a continual source of controversy.

In some cases, political issues, mainstream medicine and alternative medicine all collide, such as the case where synthetic drugs are legal but the herbal sources of the same active chemical are banned. In other cases, controversy over mainstream medicine causes questions about the nature of a treatment, such as water fluoridation. Alternative medicine and mainstream medicine debates can spill over into freedom of religion discussions, such as the right to decline lifesaving treatment for one's children because of religious beliefs.

Government regulators continue to attempt to find a regulatory balance. Jurisdiction differs concerning which branches of alternative medicine are legal, regulated, and are provided by a government-controlled health service or reimbursed by a private health medical insurance company.

The United Nations Committee on Economic, Social and Cultural Rights states that "Furthermore, obligations to respect include a State's obligation to refrain from prohibiting or impeding traditional preventive care, healing practices and medicines, from marketing unsafe drugs and from applying coercive medical treatments, unless on an exceptional basis for the treatment of mental illness or the prevention and control of communicable diseases."

A number of alternative medicine advocates disagree with the restrictions of government agencies that approve medical treatments. In the USA the Food and Drug Administration's criteria for experimental evaluation methods impedes those seeking to bring useful and effective treatments and approaches to the public, and that their contributions and discoveries are unfairly dismissed, overlooked or suppressed.

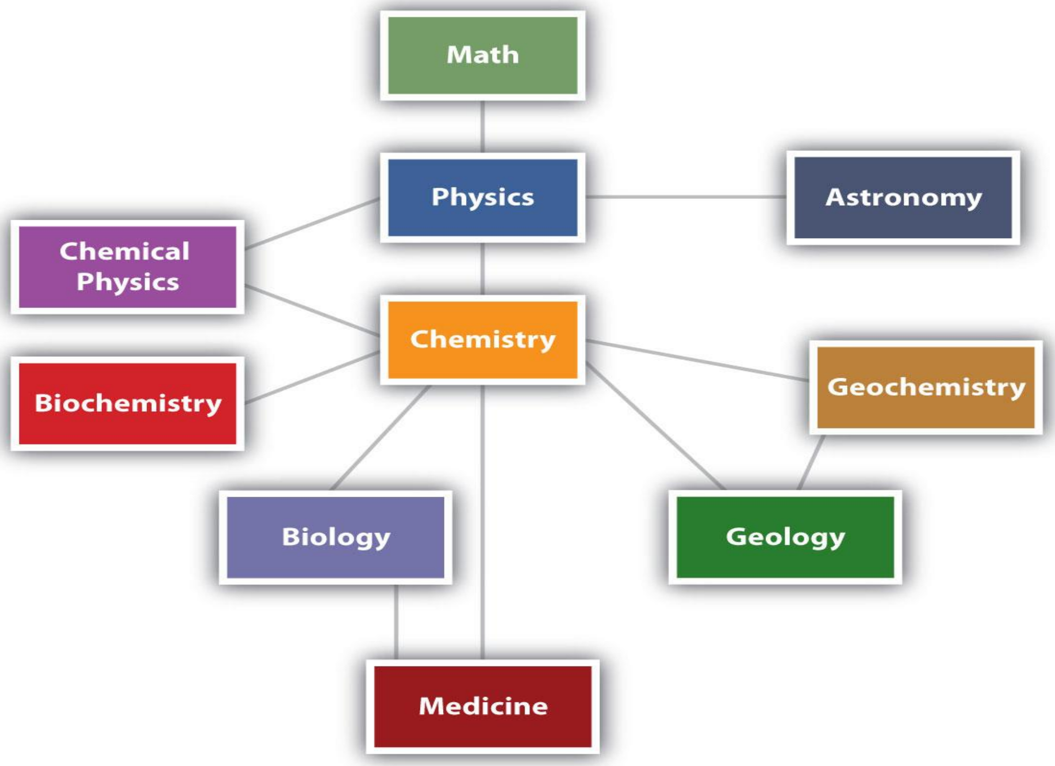
Alternative medicine providers recognize that health fraud occurs, and argue that it should be dealt with appropriately when it does, but that these restrictions should not extend to what they view as legitimate health care products.

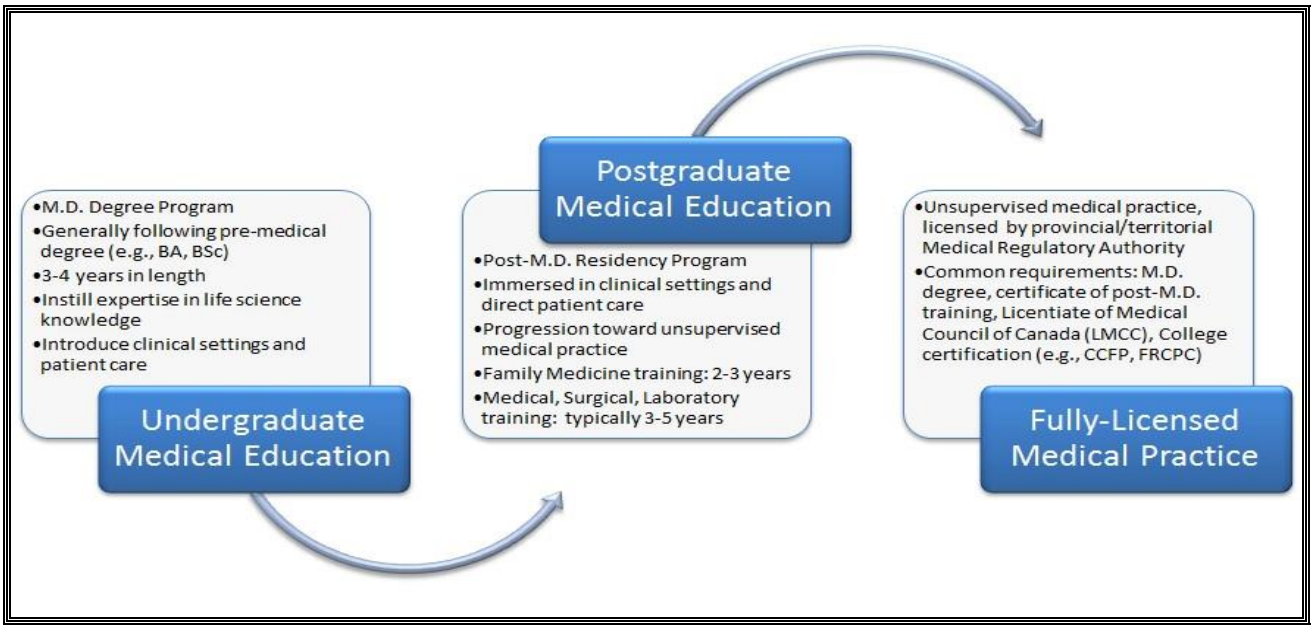
Exercise 1. Describe the score of medical education.

Exercise 2. Make up some dialogues from the information above.

Exercise 3. Render the main idea of the information.

Exercise 4. Add some in formation and make up a small report and give a talk in class.


Math
Physics
Astronomy
Chemical Physics
Chemistry
Biochemistry
Geochemistry
Biology
Geology
Medicine


Undergraduate Medical Education
•M.D. Degree Program
•Generally following pre-medical degree (e.g., BA, BSc)
•3-4 years in length
•Instill expertise in life science knowledge
•Introduce clinical settings and patient care
Postgraduate Medical Education
•Post-M.D. Residency Program
•Immersed in clinical settings and direct patient care
•Progression toward unsupervised medical practice
•Family Medicine training: 2-3 years
•Medical, Surgical, Laboratory training: typically 3-5 years
Fully-Licensed Medical Practice
•Unsupervised medical practice, licensed by provincial/territorial Medical Regulatory Authority
•Common requirements: M.D. degree, certificate of post-M.D. training, Licentiate of Medical Council of Canada (LMCC), College certification (e.g., CCFP, FRCPC)

CONVENTIONAL TREATMENTS

Conventional treatments are subjected to testing for undesired side-effects, whereas alternative treatments generally are not subjected to such testing at all.

Any treatment – whether conventional or alternative – that has a biological or psychological effect on a patient may also have potentially dangerous biological or psychological side-effects. Attempts to refute this fact with regard to alternative treatments sometimes use the appeal to nature fallacy, *i.e.* "that which is natural cannot be harmful".

An exception to the normal thinking regarding side-effects is Homeopathy.

Homeopathic preparations, termed "remedies," are extremely dilute, often far beyond the point where a single molecule of the original active (and possibly toxic) ingredient is likely to remain. They are thus considered safe on that count, but "their products are exempt from good manufacturing practice requirements related to expiration dating and from finished product testing for identity and strength," and their alcohol concentration may be much higher than allowed in conventional drugs.

Those who have experienced or perceived success with one alternative therapy for a minor ailment may be convinced of its efficacy and persuaded to extrapolate that success to some other alternative therapy for a more serious, possibly life-threatening illness.

For this reason, critics argue that therapies that rely on the placebo effect to define success are very dangerous. "Unvalidated or scientifically unsupported mental health practices can lead individuals to forgo effective treatments" and refers to this as "opportunity cost". Individuals who spend large amounts of time and money on ineffective treatments may be left with precious little of either, and may forfeit the opportunity to obtain treatments that could be more helpful. In short, even innocuous treatments can indirectly produce negative outcomes.

A study published in 1998 indicates that a majority of alternative medicine use was in conjunction with standard medical treatments. Approximately 4.4 % of those studied used alternative medicine as a replacement for conventional medicine. The research found that those who used alternative medicine tended to have higher education or report poorer health status.

Dissatisfaction with conventional medicine was not a meaningful factor in the choice, but rather the majority of alternative medicine users appear to be doing so largely because "they find these health care alternatives to be more congruent with their own values, beliefs, and philosophical orientations toward health and life."

In particular, subjects reported a holistic orientation to health, a transformational experience that changed their worldview, identification with a number of groups committed to environmentalism, feminism, psychology, and/or spirituality and personal growth, or that they were suffering from a variety of common and minor ailments – notably anxiety, back problems, and chronic pain. Authors have speculated on the socio-cultural and psychological reasons for the appeal of alternative medicines among that minority whose use them in lieu of conventional medicine.

There are several socio-cultural reasons for the interest in these treatments centered around the low level of scientific literacy among the public at large and a concomitant increase in antiscientific attitudes and new age mysticism. Related to this are vigorous marketing of extravagant claims by the alternative medical community combined with inadequate media scrutiny and attacks on critics.

There is an increase in conspiracy theories towards conventional medicine and pharmaceutical companies, mistrust of traditional authority figures, such as the physician, and a dislike of the current delivery methods of scientific biomedicine, all of which have lead patients to seek out alternative medicine to treat a variety of ailments. Many patients lack access to contemporary medicine, due to a lack of private or public health insurance, which lead them to seek out lower-cost alternative medicine. Medical doctors are also aggressively marketing alternative medicine to profit from this market.

In addition to the social-cultural underpinnings of the popularity of alternative medicine, there are several psychological issues that are critical to its growth.

One of the most critical is the placebo effect, which is a well-established observation in medicine. Patients can also be averse to the painful, unpleasant, and sometimes dangerous side effects of biomedical treatments. Treatments for severe diseases such as cancer and HIV infection have well-known, significant side effects.

Even low-risk medications such as antibiotics can potentially cause life-threatening anaphylactic reactions in a very few individuals. More commonly, many medications may cause minor but bothersome symptoms such as cough or upset stomach. In all of these cases, patients may be seeking out alternative treatments to avoid the adverse effects of conventional treatments.

Exercise 1. Explain potential side-effects.

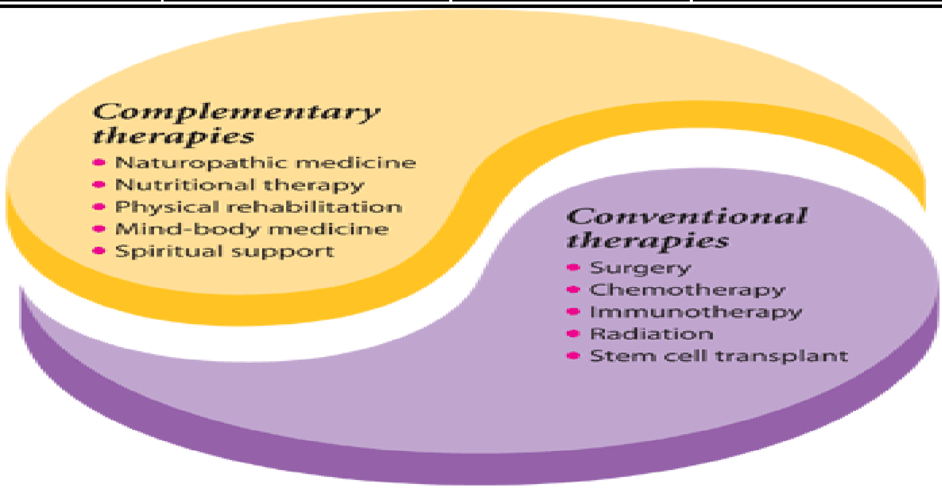
Exercise 2. Try to understand interactions with conventional pharmaceuticals.

Forms of alternative medicine that are biologically active can be dangerous even when used in conjunction with conventional medicine. Examples include immuno-augmentation therapy, shark cartilage, bioresonance therapy, oxygen and ozone therapies, insulin potentiation therapy.

Some herbal remedies can cause dangerous interactions with chemotherapy drugs, radiation therapy or anesthetics during surgery, among other problems. An anecdotal example of these dangers was reported by Associate Professor Alastair MacLennan of Adelaide University, Australia regarding a patient who almost bled to death on the operating table after neglecting to mention that she had been taking "natural" potions to "build up her strength" before the operation, including a powerful anticoagulant that nearly caused her death.

Exercise 3. Transfer the given information from the passages onto a table.

№	Activity			
	Events	**When**	**Where**	**Score**
1.				



UNIT IV. PROBLEMS OF MEDICINE

MEDICINE THAT WILL KILL OR CURE

Ever since a patient of mine cured his sciatica by crashing his car, I have taken an interest in unusual and dramatic forms of self-treatment, whether these are deliberate or involuntary. A week earlier a charming West Indian car mechanic had pulled his back while fixing an engine.

Stoically, he carried on working as his pain gradually got worse and started to radiate down the back of his neck – a classic symptom of sciatica usually due to a displaced disc. As he was driving to work one morning, his car skidded and crashed into a lamppost.

He emerged shaken but unhurt to find his sciatica had completely disappeared. Indeed, it was this instantaneous recovery that finally brought him to the surgery for a check-up as he feared he must have harmed himself in some other way. I assured him he had not, and that he had benefited from an unusual, if expensive, forms of self-treatment – "automanipulation". A method of self-treatment discovered by a farmer in Illinois subsequently proved to be life saving in the South American jungle.

The farmer, hyper-allergic to bee stings, found by chance that applying a high-voltage shock to the place where he had been stung prevented the usual severe reaction. Hearing of this, an Ecuadorian doctor, Ronald Guderian, used the same technique on 34 consecutive cases of snakebite and found that "within 15 minutes" all the pain had gone and the usual complications of an untreated bite – swelling, bleeding, shock and kidney failure – did not develop. He speculated that the electric shock must constrict the local blood vessels, preventing the spread of the snake venom. Occasionally, self-treatment may be life saving, but not in the way intended. The Lancet reported the case of an Australian ratcatcher who regularly dosed himself with rat poison – the anti-clotting drug warfarin – as a general preventive measure against having a heart attack.

One day he took a little too much and started haemorrhaging through the rectum. Investigation in hospital revealed the source to be a small operable cancer of the lower bowel. If it had not been for the warfarin-induced bleeding, the tumour may not have been detected until it was too late.

The most dramatic example of self-treatment involved do-it-yourself brain surgery. Writing in the British Journal of Psychiatry, Professor L. Solyom, of the University of Columbia, described the case of a young man, severely affected with an obsessive disorder centred on cleanliness, who would spend up to six hours a day just washing his hands and taking showers. This, naturally enough, interfered with his ability to lead a normal life and as a result he became depressed and then suicidal.He decided to end it all by shooting himself through the head from which injury, with the help of neurosurgeons at the local hospital, he surprisingly recovered.

To the patient's relief and the amazement of his psychiatrists, he was now no longer depressed and his obsession with cleanliness was limited to insisting that his mother kept the bathroom and kitchen spotlessly clean. Two years later he was found to be "consistently calm and cheerful" and had completed his high-school education. A scan showed the bullet had damaged part of the frontal lobe of the brain, fortuitously mimicking the technique of lobotomy used by brain surgeons in the 40s for the treatment of intractable mental illness. However, the award for the most consistent and ingenious method of self-treatment goes to a farmer in Northern Ireland. He, over a period of 30 years, discovered several cures for the recurrent bouts of palpitations caused by his abnormally fast heart rhythm.

This condition – known as a supraventricular tachycardia – is usually treated by drugs, though often responds top "shocks" of various types. When the farmer first got his palpitations he would jump from a barrel and thump his feet very hard on the ground when landing.

This became less effective with time, so his next cure involved removing his clothes, climbing a ladder and jumping from a considerable height into a cold-water tank. Later he discovered that the simplest treatment was with one hand to grab hold of his six-volt electrified cattle fence, earthing the shock by simultaneously sticking a finger of the other hand into the ground. Ingenious as all these treatments were, his cardiologist advised that a more up-to-date approach was probably called for and the farmer now has a special pacemaker which recognises when his heart rhythm shoots up to 150 beats a minute, and administers two small electric shocks which restore it to normal.

Exercise 1. Choose the keywords and phrases that best convey the gist of the information.

Exercise 2. Answer the questions.

1. What are unusual and dramatic forms of self-treatment? 2. What doe sthe term "automanipulation" mean? 3. Who discovered a method of self-treatment? 4. What does this methord proved to be? 5. What did an Ecuadorian doctor, Ronald Guderian do? 6. What is the case of an Australian ratcatcher like? 7. What is the most dramatic example of self-treatment? 8. What did Professor L. Solyom write? 9. Did you do self-treatment?

Exercise 3. Read the story «Learn the harmonies of health» and retell it.

Humming is a good way of calming yourself. If you're feeling stressed, anxious or nervous, just sit quietly and hum very gently. Feel the hum resonating through your body. Where can you feel it? Does it change if you alter the note of the hum?

Exaggerated yawning is ideal if you're feeling tired. We hold a lot of tension in our jaws and mouths and stretching the mouth releases tension. Give a good stretch as well to really wake up the whole body. If you're feeling irritable and tense try an elongated, noisy sigh.

Chris James, the Australian workshop leader, recommends deep groaning as well to release any negative emotions. Try singing the vowel sounds – uuuh, ooo, oooh, aaah, eeeeh, iiii. Where do you feel them in your body? How do they make you feel? Take every opportunity to sing. Sing with the radio, while you're doing the housework, while you're in the bath or, even better, while you're driving in your car. Don't worry about what your voice sounds like; simply enjoy really belting it out.

Play with mantras. Try singing positive statements, repeating them with different tunes. If you're feelings tense, try singing: "I'm calm, I'm calm"; if you need to feel more assertive, try: "I've got a right to be heard." Experiment with listening to different music and work out what effect it has on your moods. Try listening to some of the sacred chants available on tape for deep relaxation and a profound sense of peace.

Exercise 4. Translate the words and phrases into Russian.

Manipulation treatment; radiation treatment; shock treatment; under treatment; to undergo treatment for alcoholism; to take treatments; to administer (give, provide) treatment; to get (receive, undergo) treatment; to respond to treatment; dental treatment; inpatient treatment; outpatient treatment; electrical treatment; to give smb. the silent treatment; silent treatment; absent treatment; compulsory treatment; social treatment; treatment allowance; treatment interview; treatment of common diseases; treatment sheet; treatment station; treatment section; treatment room; treatment regimen; treatment policy; treatment timer.

Exercise 5. Translate the sentences with the keyword «treatment».

1. Treatment is medical attention given to a sick or injured person or animal. 2. Many patients are not getting the medical treatment they need. 3. He is a veterinary surgeon who specialises in the treatment of cage birds. This is an effective treatment for eczema. 4. Treatment of something involves putting a particular substance onto or into it, in order to clean it, to protect it, or to give it special properties. 5. If you say that someone is given the full treatment, you mean either that they are treated extremely well or that they are treated extremely severely.

EVIL MEN HAVE ALWAYS WANTED TO DESIGN A MASTER RACE

Birth control is the most significant invention of the 20th century. When people look back they will consider other candidates – the motorcar, aeroplanes, antibiotics – but they will always come back to reliable birth control. Our capacity to manipulate the number and timing of our children revolutionized the role of women and turned the family upside down. It prevented unsustainable population growth, which could have destroyed civilization through hunger and war.

Scientists have proved they can turn off the tap of human reproduction. The next step will be to turn it back on selectively. One day, parents could design their ideal baby, selecting genes for hair colour, height and intellect. That is where science is heading. It's a horrifying thought.

It was revealed that scientists in America have transferred immature sperm cells from a mouse to a rat. In their new home, the sperm matured and were used to fertilize female mice.

The experiment was part of an infertility programme, designed to show that men who cannot grow mature sperm may one day be able to have babies by incubating their sperm inside an animal from another species. The experiment also proved that the genetic code carriers inside each sperm which help determine everything, from eye colour to intelligence – can be manipulated.

The genetic changes would then be passed from one generation to the next. At the University of Pennsylvania researchers have already proved this can be done in mice and monkeys. Altering genes in sperm has so much significance because scientists have, at last, found most of the gene map. Scientists identified all 100,000 human genes. In two years scientists have pinned down more than one third. They know the gene for obesity, blue eyes, appetite and shortsightedness.

Once we know all the genes, people will be able to choose which ones they want. Doctors are already able to test for an array of genetic abnormalities in the early stages of fetal development.

Parents can then use the test results to decide whether to continue the pregnancy.

What would the world be like if the parents of myopic geniuses like Einstein had possessed and used this kind of information? An even better example may be depression.

There's a gene for that and it has been identified. Does anybody want a maniacally depressed child? The gene would probably have been found in Mozart, Van Gogh and a host of other geniuses.

Sometimes human imperfection is the source of all that's best in human achievement. It's madness, but to scientists it's just one more frontier to pass. So far scientists in Boston have grown human body arts and have jumped many of the barries to constructing entire human beings from scratch, without involving sperm or embryos. Biochemists in Connecticut have developed an artificial womb. The technology is moving at lightning speed while the lawmakers sleep. The research is giving the human race a dangerous set of new choices.

It's doubtful that our moral sophistication is growing anything like as fast as the technology.

In the 1800's the British scientist Francis Galton wrote about the possibility of producing "a highly-gifted race of men by judicious marriage during successive generations." He called his new science of selection "eugenics" and he would have been delighted with the chance to manipulate the genes inside sperm cells at their source. Galton was a hero to the Nazis who used him as one inspiration for the extermination of six million "genetically inferior Jews".

That's the sort of horror which can befall the human race when this kind of science falls into the wrong hands, which it always does. Says Phillip Kitcher, a philosophy professor at the University of California: "The risks are enormous. Parents will want to design the perfect baby and there will be doctors prepared to help them – for a price."

Exercise 1. Choose the keywords and phrases that best convey the gist of the information.

Exercise 2. Answer the questions.

1. What is the most significant invention of the 20th century? 2. What did the scientists do in America? 3. The genetic changes would then be passed from one generation to the next, wouldn't they? 4. How many human genes did scientists identify? 5. Are doctors able to test for an array of genetic abnormalities in the early stages of fetal development? 6. What would the world be like if the parents of myopic geniuses like Einstein had possessed and used this kind of information? 7. Does anybody want a maniacally depressed child? 8. What did the British scientist Francis Galton write in the 1800s? 9. How did he call his new science?

Exercise 3. Analyze the article and write out all words and phrases according to the topic.

Still living in the Stone Age

Psychologists working in a new area of research are starting to realize that much of our behaviour is controlled by our genes, rather than culture. So are we more "animal" than we realise?

Shortly after the British naturalist, Charles Darwin, published his theory of evolution, a Victorian lady was asked what she thought of the idea that humans and animals were descended from a common ancestor. "Let us hope it is not true", she said. This story illustrates well the attitudes of the time. Today, we are more comfortable with our past. Many people accept Darwin's view of how we came into being – that our bodies evolved through the process of natural selection acting on our genes. However, Darwin predicted that "in the distant future, psychology will be based on a new foundation". This foundation was, of course, his theory of evolution. To proponents of concepts like free will and personal responsibility, such an idea seems absurd.

But a growing number of scientists are questioning the extent to which our behaviour is controlled by our culture. Their research has revealed increasing evidence that the human mind is made up of innate mechanisms, which control everything from the way we perceive time and space, to how we learn survival techniques and choose mates. Evolutionary psychologists believe that many aspects of human behaviour can be explained by understanding what would have helped us to survive in the past. Take our desire to consume high-fat foods rather than high-fibre vegetables.

Our brains evolved to prefer foods with lots of calories because our early ancestors, who lived by hunting and gathering, continually faced a shortage of high-energy foods.

Today, we suffer heart disease and other illnesses caused by high-fat diets because we are simply not accustomed to having access to so much high-energy foods.

Like our animal cousins, we evolved to deal with the instantaneous life or death situations that characterize life in the wild. But we no longer live like that. Instead we suffer long-term stress from uncertainties like job insecurity and poverty. And, when we come into conflict with others, we are forced to enter legal disputes which may take years to resolve, when our natural instinct is just to lash out and leave it at that. The future ramifications of this young theory are legion. Apart from the philosophical issues it raises, it will challenge most, if not all, of our current ideas, systems and laws.

DEATH CAUSED BY DOCTORS

It's official, Doctors kill more people through mistakes, drug side-effects, hospital infections, botched surgical procedures (many of which are totally unnecessary) and other important "treatments" than any of the "diseases" they claim to treat! (and that's WITHOUT including the huge number of cancer patients killed by their "treatment"). How can this be true? Surely modern medicine is the most technologically advanced, capable and freely available we have ever had? Well, yes....and no!

Whilst it is true that technological advancements have continued to bring new possibilities to modern medicine, many of these "advances" are questionable, either in terms of their necessity, their results or their practical application. At the same time, centuries (and sometimes millenias) old, proven forms of medicine have been ignored, shelved and increasingly rediculed by a pharmaceutical-basd organisation that doesn't understand them...and doesn't want to. Even when convincing and consistent natural treatments are brought to light that are FAR more successful than their modern, pharmaceutical alternatives, the powers that be in modern medicine not only ridicule them, but REFUSE to even study them – so much for their interest in human health! How can this be?

Surely Doctors are the most altruistic of beings, determined to help others at every opportunity? Well, yes. And again, no. Whilst many, perhaps even the majority of Doctors see their role as providing help to the needy, their hands are hopelessly tied (and their education directed) by Government, regulatory authorities and research bodies that are ENTIRELY under the control of the industrial and pharmaceutical giants.

It is a sad fact that virtually 100% of ALL medical education (both under-graduate and post-graduate) is paid for either directly or indirectly by the pharmaceutical industry. As such, the industry can control the educational agenda and our doctors are now taught little except how to control the symptoms of disease, preferably with long-term drug use. It is not the Doctors themselves that are at fault, but the pharmaceutical marketing system that trains them. Now lets think about what that means. EVERY Doctor, regardless of his / her own convictions, is taught that the way to treat disease is to use drugs, often without even considering the underlying causes of the disease. **Examples**

- *High blood pressure* (hypertension). Modern medicine uses various drugs to drop the blood pressure – without considering why the body had elevated it in the first place.
- *Angina* – Modern medicine uses drugs to "cover-up" the symptoms of angina and other forms of heart diease, without telling you you can actually reverse the damage that is causing it!
- *High Cholesterol* – modern medicine uses drugs to artifically force lower cholesterol levels, without thinking about WHY the body raised them in the first place (clue: it is a defensive mechanism!)
- *Depression* – modern medicine dopes adults and (increasingly) kids with toxic drugs to cover up pyschiatric / psychological issues that are caused by malnutrition, plain and simple. (specifically, a chronic lack of omega-3 fatty acids)

Yet the few who are prepared to speak out against these giant corporations are shunned by their own colleagues, whose blinkered, self-serving attitudes are exactly what their pharmaceutical bosses want to see. Take these examples.

- Dr. Weston A Price, who proved beyond all doubt that the chronic diseases we have seen emerge in the 20th century are largely caused by our increasingly poor nutrition.
- That in 26 separate "primitive" societies, these diseases DO NOT EXIST – until you give them a Western diet! He was IGNORED by modern medicine.
- Dr. Linus Pauling, one of the few people EVER to win TWO Nobel prizes, who showed not only that ischaemic heart disease is nothing more than chronic scurvy (Vitamin C deficiency), but that ALL CHRONIC DISEASE is caused by mineral deficiencies. Modern medicine ridiculed his results without even studying them, but has no answer to his success in treating patients.
- Dr. Mary Enig (author of Know Your Fats: The Complete Primer for Understanding the Nutrition of Fats, Oils and Cholesterol).

He is one of the pioneer scientists involved in assessing the role of various fats in heart disease and cancer in the 1950s, who proved that saturated fats (in butter, cheese, eggs and meat) PROTECT against these diseases, whilst the unnatural hydrogenated vegetable oils used in margerines (and virtually all prepared foods) CAUSE the very problems they are supposed to prevent.

She was shunned by the modern medicine establishment and all research funding was withdrawn, despite the fact that the evidence fully backed her up. And these are just a few examples from many cases where modern medicine is so entrenched in its pharmaceutical-based "symptom treatment" paradigm that it has totally lost all interest in PRVENTING disease, which is exactly what Natural Medicine is all about. As if they weren't enough, the pharmaceutical industry, through its pressure group, Codex Alimentarius, is now trying to ban the very minerals and vitamins that can prevent and treat disease – fight it!

So what can you do about it? The answer is very simple – make sure you are informed about your health problems, and make sure your Doctor, or other health care professional is informed too. If your Doctor doesn't undestand the importance of nutrition, find another Doctor who does.

- Establish a routine of basic nutrition, which in many cases is enough to stop many "chronic diseases" in their tracks.
- If you already suffer from a "chronic disease", don't just accept lifelong treatment, find out which deficiencies are implicated and (if basic nutrition for a few months doesn't do the job) correct them, you will be amazed at the results. Contact us for more information
- Be prepared for the long term – most "diseases" take years to develop, they WILL take time to recover from too.
- Join the Alliance for Natural Health, who are working to undo the illegal Eurpoean Directive on Food Supplements (ESPECIALLY if you are in the USA – the EU law is a prototype intended for the US to follow)

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Give the main idea of the text «The Last generation» in some English sentences.

More than 30 years ago science fiction author Brian Aldiss wrote *Greybeard*, a novel about a world without fertile humans. And four years ago P.D. James took time out from writing crime stories to warn about the folly of ignoring the consequences of our technological progress, in a scary novel entitled *The Children of Men*. Set in 2021, James's narrator wonders why no one in the last years of the 20th century suggested that the fertility of the human race was dramatically changing.

The world Aldiss and James portrayed looms. A zoologist has come up with compelling evidence to suggest that the fertility of men is dramatically declining under the influence of synthetic chemical present in pesticides, plastics and detergents. These chemicals are ubiquitous in modern society. Theo Colborn estimates that as many as 500 measurable chemicals are now present in our bodies. Colborn is not being thanked for her research, even though she believes it is only a matter of time before the force of her message hits home and remedial action is taken.

Theo Colborn says scientists already know that the body shuts down when it receives an overload of hormone-disrupting chemicals. Thus synthetic chemicals that disrupt the endocrine system are at their most dangerous at low levels. As Colborn stresses, these chemicals do not kill cells.

Colborn and those who have studied the impact of endocrine-disrupting chemicals on human health acknowledge that many plants produce chemicals that can mimic hormones. It is her contention, however, that while those plants can have an oestrogenic effect on the animals and humans consuming them, they are easily broken down and excreted from the body.

Synthetic chemicals, on the other hand, accumulate in the human body, causing low-level, long-term biological damage. Colborn says: "We must consider how we use materials in industry, commerce and our domestic lives. If we don't, we are putting the diversity of life on earth on a fast track to extinction".

Exercise 3. Answer the questions.

1. How do doctors kill more people than any of the diseases? 2. Is modern medicine the most technologically advanced, capable and freely available we have ever had? 3. Is true that technological advancements have continued to bring new possibilities to modern medicine? 4. Are doctors the most altruistic of beings, determined to help others at every opportunity? 5. How is doctors taught to treat people? 6. Do the majority of doctors see their role as providing help to the needy? 7. Are regulatory authorities under the control of the industrial and pharmaceutical giants?

Exercise 4. Read the text and answer the question: How to go on diet?

Last summer my doctor told me to go on a slimming diet, which, he said, would make me lose twenty pounds in a month. For breakfast, I was allowed to drink coffee or tea and nothing else. For lunch, grilled meat, no salt; a hundred grams of vegetables, no salt; fifty grams of cheese or yoghurt, a choice of an orange or an apple. The same for dinner. I wasn't allowed to drink anything with meals.

The first day was fine, though I was so hungry that I went to bed at eight. The next morning my wife said an egg with breakfast wouldn't hurt me. So I ate an egg since she is wiser than I am in these matters. At noon I lunched with a friend who said, "Meat is more fattening than potatoes. My doctor lets me eat all the potatoes I want to, without butter, of course." So I had potatoes with my meat. In the evening I dined with a Frenchman. He was shocked to think that I wouldn't drink wine with my dinner.

So I had half a bottle of Burgundy with my dinner. I went on dieting taking my meals with different people. Each one had his own idea about dieting and I was willing to listen to everybody.

Exercise 5. Tubby idlers «fail at school».

Overweight and unfit children could be left behind in the learning race, a health chief claimed yesterday. Echoing the old adage about a healthy body making a healthy mind, he said that a poor diet and lack of exercise is handicap when it comes to academic excellence. "Physical fitness is needed for mental agility", said Dr John Middleton, public health director of Sandwell, West Midlands.

He warned in his annual report that children in the area were in danger of following the example of their parents, who are ranked as the most inactive in the West Midlands. "If you are not physically fit you may not pass your exams", said Dr Middleton. "Sandwell schoolchildren are inactive too much and involved too little." Sandwell has one of the worst academic records in England, coming 125th out of 132 in the national school league tables. But Dr. Middleton's remarks were attacked by teachers, nutritionists – and pupils. The British Nutrition Foundation said: "It is very difficult to support the idea that ability is due to diet. There are many other factors."

Exercise 6. Read the article and answer the question: When dieting becomes dying?

Girls are becoming more and more obsessed with their weight. A survey by the Society For Eating Disorders shows that this problem is getting worse. One girl in 25 is likely to suffer from some type of anorexia. Studies have shown that girls as young as 9 years old are choosing their friends according to how thin they are. This has left slightly chubbier girls without friends.

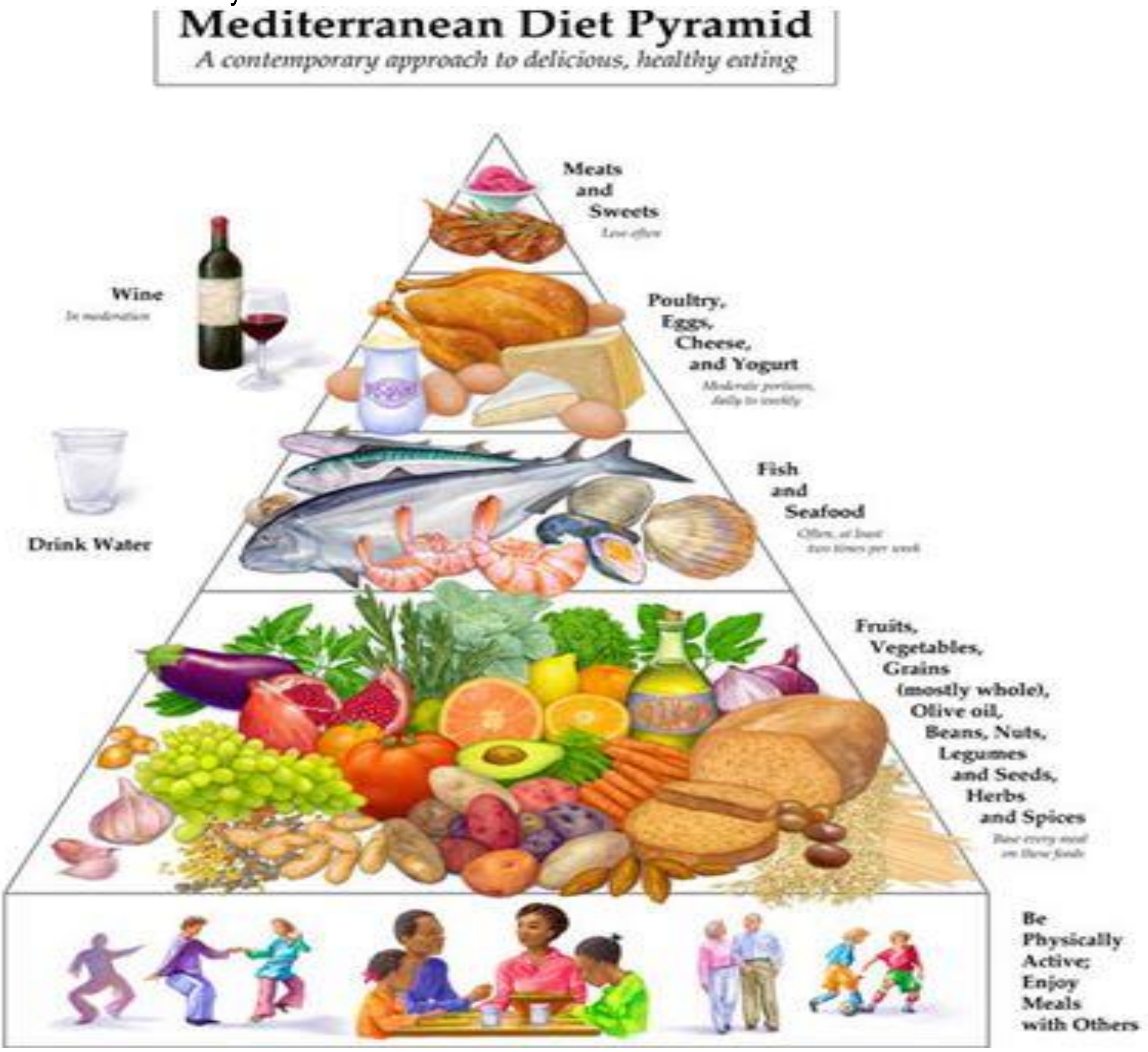
Before they are even teenagers, girls without the "perfect body" often feel lonely and depressed. They try extremely dramatic diets and even try to starve themselves. The people who suffer from anorexia often hide it because they know that many people will just think they are stupid.

Exercise 7. Read the passage and explain how model roles models.

Renay, who is now 18 says her problem started when she was 14. She says, 'I decided to go on a diet because my best friend was much thinner than me. She was also very popular. I thought if I lost weight, people would like me more and I would have more confidence. Renay's diet worked. She lost weight and people told her she looked good so she lost even more weight. She didn't want to stop until she was happy with her body. She was used to missing meals and saying she had eaten when she hadn't. She had seen very skinny fashion models in magazines like Vogue and she wanted to be like them. She started hating her body and starving herself until she became seriously ill.

Exercise 8. Read the article and explain the title «Not thin enough».

Many modeling agencies have told girls who are already very under-weight to lose a lot more weight. Lucy had anorexia when she was 15. She weighed just 41 kilograms and was waiting to go into hospital to be treated for her anorexia when two agencies told her she was the right weight to model. She says, ‘It was ridiculous. I looked like a ghost or a famine victim, my skin was terrible and my eyes had sunk into my face.



MEDICAL BRIEFS

New for Fat-Lovers

Eating fat can help to prevent strokes, according to the latest research. At a time of year when the temptation to tuck into fat-laden foods is at its highest, that may sound like a welcome surprise. But doctors still warn against piling more cream on the Christmas pudding.

For it remains the case that fat increases the danger of a heart attack. In the new study American researchers looked at 832 men aged 45 to 65, and found that those increasing their fat intake by 3% reduced their overall risk of a stroke by 15% .

Eating slightly more of the saturated fat in meat and dairy products and monounsaturated fat, found in nut and olive oils, was also linked to a lower risk of having an ischemic stroke – the most common type, caused by a blockage of a blood vessel in the brain or neck. But there was no reduction in risk linked to eating polyunsaturated fat, found in fish and vegetable oils.

The findings might seem like good news for fat-lovers but eating more fat was a risk factor for heart disease. Increasing your consumption of fruit and vegetables is something everyone can do that improves health – as well as having a walk after dinner!

Youths Inject Vodka

Teenagers in rural communities are injecting vodka and whisky to achieve a quick high as the drug culture spreads to market towns and villages.

In their desire to get drunk instantly, children as young as 14 are injecting spirits and even lager and cider directly into the bloodstream. The potentially fatal technique makes alcohol seven times more powerful than when consumed as a drink and carries a high risk of causing strokes.

The trend, in which youngsters are exploiting the availability of alcohol – easier than access to illegal drugs – has been revealed by members of the Home Office police research group.

Medical experts say that injecting alcohol can introduce air bubbles into the body, blocking the blood flow to the brain and inducing a stroke. It is also easy to miscalculate the amount of alcohol injected and administer a lethal dose. Although drug experts say the number of people injecting alcohol remains small, they fear an increase.

Bad medicine?

Experts say that there may be as few as 5,000 tigers left in the world. Meanwhile, there's an ever-increasing demand for tiger products, which are used in traditional Chinese medicine. The fact that it's illegal to hunt tigers doesn't stop the poachers. Chinese medicine is over 2,000 years old. Is it too old to change its ways?

"It's not just westerners who care about animals", says one Chinese doctor, "if they die out, we suffer too". However, there's no doubt that the trade in animal products for Chinese medicine could mean the end of tigers in Siberia, rhinos in Africa and bears in China. In the past, Western doctors have dismissed Chinese medicine as superstitious. However, Chinese medicine seems to work successfully for millions of people. British medicine has been available in Hong Kong for 150 years, but people haven't stopped using traditional Chinese remedies. Experts say that there may be as few as 5,000 tigers left in the wild. At the Chinese Medical Material Research Centre, scientists have been testing traditional Chinese remedies. They've found that high doses, rhino horn does help to reduce a fever. But they've also discovered that the horn of oxen, water buffalo and antelope have the same effect. Tiger bone is used to treat muscle paint and paralysis, but researchers have discovered that bone from the zukor, (a small Chinese rodent) can be used as a substitute.

Charities

Charities are doing their best to stop the illegal trade in animal products. As well as following poachers, they collect information on smugglers and dealers. Their information has led to successful prosecutions in Australia, New Zealand, Belgium and the UK.

Shoot a tiger – win the lottery

While there is such a huge demand for tiger products it's almost impossible to stop tigers from being killed. A Cambodian poacher can earn 10 times his annual income by shooting just one tiger.

For the poacher, it's like winning the lottery. 50 years ago, there were 25,000 tigers in the world. Now the figure could be as low as 5,000.

Bring on The Substitutes

If charities are fighting a losing battle, are there any alternatives? At the Chinese Medicinal Material Research Centre, scientists have been testing traditional Chinese remedies. They've found that in high doses, rhino horn does help to reduce a fever. But they've also discovered that the horn of oxen, water buffalo and antelope have the same effect. Tiger bone is used to treat muscle paint and paralysis, but researchers have discovered that bone from the zukor, (a small Chinese rodent) can be used as a substitute.

Smoking study shows new cancer risk

Decades of tobacco trigger change in lungs say researchers. "Once this switch is turned on it appears to be permanent, which may explain why long-term ex-smokers who have not had a cigarette in 25 years are still at high risk for getting cancer". The deadly nature of cigarettes was re-emphasized with a new study suggesting that people who have smoked for more than 25 years may have caused lung cell damage which cannot be stopped by quitting. According to researchers from the University of Pittsburgh, long-term smoking appears to trigger a biological switch in the lungs which causes cell growth and this in turn could lead to cancer. The researchers looked at three groups: non-smokers, those who had smoked for less than 25 years, those who had smoked for longer. In people who smoked at least 20 a day for 25 years, the doctors found significantly more evidence of a protein called GRP, which spurs lung cells to divide. They say that 77% of the long-term smokers showed the protein, but it appeared in only 155 of those who had smoked for less than 25 years. The long-term smokers showed the protein even if they had stopped smoking some time ago.

Dr. Jill Siegfried, of Pittsburgh University's lung cancer centre said, however, there was potential good news in the findings, as the protein could help identify patients at high risk of lung cancer who could receive early treatment. In the longer term, if a way could be found of turning off the "switch" it could mean ex-smokers would not get lung cancer. A spokesman said: "Most smokers die from heart disease. Stopping smoking reduces the risk of heart disease almost immediately. It's always worth giving up, whatever your age, but the sooner the better." More than half the 20,000 heart attacks each year in people under 50 have been attributed to cigarettes – with smokers in their 30s and 40s five times more likely to suffer a heart attack than non-smokers. One of the most powerful men in the tobacco industry admitted publicly for the first time that smoking was lethal and nicotine was an addictive drug. Geoffrey Bible, chief executive of Philip Morris, testified in a Florida lawsuit that cigarette smoking may have caused 100,000 deaths.

New solutions?

Unfortunately, many westerners are unhappy about the idea of using any animal products in medicine. The number of wild bears in China is decreasing rapidly. But wildlife campaigners were horrified to find out that China has set up a number of bear farms, to supply bear products for the medical industry. However, unless Western conservationists and Chinese doctors work together to find new solutions, the future for endangered animals looks bleak.

AIDS

By the year 2000, there will be 10,000 children under the age of 15 in the UK who have a parent who is HIV-positive or has AIDS. Some of these children will be told about their parent's illness.

Others won't be told until after their mother or father has died. Which way is better? Should these kids know the truth or is it better for them to be happy in their innocence?

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Pay attention to AIDS – The Facts.

- AIDS is the sixth leading cause of death among 15-24- year-old Americans.
- By the middle of last year, 9 million children across the world had lost their mother to AIDS.
- The British government has promised to spend an extra 11% on AIDS research next year.
- Doctors are hoping that a combination of 3 different drugs can help to control AIDS.

Exercise 3. Read John's story and say your attitude to the problem.

John is 14 years old. He doesn't go on school trips, play football or even see his friends very much apart from when he is in school. His teachers think he is lazy because he never does his homework. The truth is very different; John spends most of his time cleaning the house, shopping, looking after his sister and giving his mother medicine.

His mother is HIV-positive and he is the only person who looks after her. He knows she's ill but he doesn't know why. She won't ask for anybody's help because she doesn't want to tell them what's wrong with her. John's mother will probably die before someone tells him the whole story. Then, he will have to cope with the sadness of his mother's death and the news of what wrong with her.

Social workers believe this will be terrible for John. He won't have been prepared for the shock that the news that a parent has died of AIDS can bring. If John's mother told him what was wrong with her now, John could get support and help from other people. It will also mean that John will never have had the chance to talk to his mother about AIDS.

Exercise 4. Answer the question.

1. What is the the worst diet in the world like? 2. What components are there? 3. Will it be distinguished? 4. What is the style of the article? 5. Who can write such an article? 6. Can it be the truth? 7. What kind of dieats do you know? 8. Have you ever use a dieat in your life?

Exercise 5. Explain our Future in medicine.

So – that's the brief guide to some of medical history's key figures. Now, though let's turn our attention from yesterday to tomorrow. What challenges lie ahead for future generations of pioneering doctors and scientists?

Cancer. There are many different kinds of cancer. Several can already be treated and, in some cases, even completely cured. Others, however, are still fatal. If cures should be found for these forms of cancer millions of lives would be saved every year. Health care in the developing world. Developing nations simply can't afford as much health care as the world's richer countries. The result? Rich people have a better chance of being healthy than poor people. This is a massive problem and one of the twenty-first century's top medical challenges.

Genetics. Genetics (the study of genes) is a relatively new science, but its medical potential is huge. What new doors will that potential open in the twenty-first century? Only time will tell.

Preventive medicine. There are two ways to make people healthy. (1) Find ways to solve medical problems, (2) prevent medical problems from happening in the first place. This second approach – preventive medicine – involves: health education; a good diet; regular exercise.

It's very simple... if you lead a healthy life, you're less likely to become ill.

Aids. At the moment there is still no cure for acquired immune deficiency syndrome.

Complementary medicine. In the last twenty years several complementary therapies like acupuncture homeopathy and osteopathy have become a popular alternative to scientific western medicine. Many people believe that a combination of "scientific" and "complementary" medicine will offer the best health care in the future.

Exercise 6. Summarize your findings on the topic and issue in a short presentation (75 words).

Exercise 7. Comment two stories on various diets.

Thin excuses

Fashion magazines deny that they are being irresponsible. Vogue's editor said girls got anorexia because they suffered from a low opinion of themselves. He blamed their friends and family for not supporting them enough. It might be true that in some cases, severe dieting is a cry for attention or help but seeing thin models doesn't help. Watch Company Omega decided that they did not want to advertise in a magazine that promoted anorexia so they told Vogue they would not use them anymore. Since then, Vogue has used one model who was not built like a matchstick and Omega have started advertising in Vogue again. Is one girl enough ? Will Vogue start using more people who are "normal weight for their height"? Fat chance !

More attractive

Many girls believe that they will be more attractive to boys if they are thinner. British comedian Alan Davies thinks this is crazy. He says, "When I was at school I don't remember anyone saying "let's go into the biology lab and find that skeleton – she's sexy !" Women worry about their weight too much; they say things like "Do you think these earrings make me look fat?"

Exercise 8. Choose the correct word from the box below to put into each space.

The mistake a lot o people make when they are on a diet is to……(1) entire meals. This is wrong because later that day they are….(2) and are desperate for something to eat. They are so hungry that thy…(3) on junk food and this makes them fatter and is not good for their bodies because the person then eats too much. This makes them….(4) weight. People often think that if they lose a lot of weight, it will make them very attractive. However, in many cases, it just makes the person look…..(5). Many people are not exactly fat, they are just…..(6) but they are convinced that they are drastically overweight. When they are on a diet, many people…..(7) chocolate. "Would you like any more food ?" "No thanks, I'm…(8)".

(crave, binge, skinny, chubby, full, starving, put on, skip)

WHAT IS THE PALEO DIET?

The **Paleo diet** is the healthiest way you can eat because it is the ONLY nutritional approach that works with your genetics to help you stay lean, strong and energetic! Research in biology, biochemistry, Ophthalmology, Dermatology and many other disciplines indicate it is our modern diet, full of refined foods, trans fats and sugar, that is at the root of degenerative diseases such as obesity, cancer, diabetes, heart disease, Parkinson's, Alzheimer's, depression and infertility. – Robb Wolf.

Ideally one should eat a wide variety of proteins from as many animal sources as possible. One need not and should not avoid fatty cuts of meat, particularly if consuming pastured sources. An often overlooked piece of the paleo diet in popular culture is an over-reliance on standard cuts of meat, at the expense of organ meats, bone broth and other collagen sources. For more information on the historical and practical aspects of consuming a more balanced protein intake, check out the Weston A. Price Foundation. If weight-loss is a goal, protein makes you feel satisfied between meals.

Fruits and vegetables are rich in antioxidants, vitamins, minerals and phytonutrients that have been shown to decrease the likelihood of developing a number of degenerative diseases including cancer, diabetes and neurological decline.

Okay to eat	**Avoid**
Fruits	Dairy
Vegetables	Grains
Lean Meats	Processed Food & Sugars
Seafood	Legumes
Nuts & Seeds	Starches
Healthy Fats	Alcohol

Scientific research and epidemiological studies show that diets rich in Monounsaturated and Omega-3 fats dramatically reduce the instances of obesity, cancer, diabetes, heart disease and cognitive decline. Saturated fat has been demonized by our health authorities and media. What is the basis for this position on Saturated fat? Are current recommendations for VERY low saturated fat intake justified? How much saturated fat (and what types), if any should one eat? Without a historical and scientific perspective these questions can be nearly impossible to answer.

For most people the fact the *Paleo diet* delivers the best results is all they need. Improved blood lipids, weight loss, and reduced pain from autoimmunity is proof enough. Many people however are not satisfied with blindly following any recommendations, be they nutrition or exercise related. Some folks like to know WHY they are doing something. Fortunately, the Paleo diet has stood not only the test of time, but also the rigors of scientific scrutiny.

With a very simple shift we not only remove the foods that are at odds with our health (grains, legumes, and dairy) but we also increase our intake of vitamins, minerals, and antioxidants. Here is a great paper from Professor Loren Cordain exploring how to build a modern Paleo diet: The nutritional characteristics of a contemporary diet based upon Paleolithic food groups. This paper also offers significant insight as to the amounts and ratios of protein, carbohydrate and fat in the ancestral diet.

The Paleo concept is new for most people and this newness can spark many questions. We like people to not only read about and educate themselves on this topic but also to “get in and do it.” Experience is perhaps the best teacher and often cuts through any confusion surrounding this way of eating. Now, all that considered, there are still some common counter arguments to the Paleo diet that happen with sufficient frequency that a whole paper was written on it. Enjoy: Evolutionary Health Promotion. A consideration of common counter-arguments.

A great question to ask is "*Does the Paleo diet work?*" Here we have a head to head comparison between the Paleo diet and Mediterranean diet in insulin resistant Type 2 Diabetics.

The results? The Paleo diet group REVERSED the signs and symptoms of insulin resistant, Type 2 diabetes. The Mediterranean diet showed little if any improvements. It is worth noting that the Mediterranean diet is generally held up by our government as "the diet to emulate" despite better alternatives. According to the **CDC**, cardiovascular disease is the number one cause of death in the United States. Interestingly however, our Paleolithic ancestors and contemporarily studied hunter-gatherers showed virtually no heart attack or stroke while eating ancestral diets. The references below will explore these facts to better help you understand the heart-healthy benefits of a Paleo diet.

Autoimmunity is a process in which our bodies own immune system attacks "us".

Normally the immune system protects us from bacterial, viral, and parasitic infections. The immune system identifies a foreign invader, attacks it, and ideally clears the infection. A good analogy for autoimmunity is the case of tissue rejection after organ donation. If someone requires a new heart, lung kidney or liver due to disease or injury, a donor organ may be an option.

The first step in this process is trying to find a tissue "match". All of us have molecules in our tissues that our immune system uses to recognize self from non-self. If a donated organ is not close enough to the recipient in tissue type the immune system will attack and destroy the organ.

In autoimmunity, a similar process occurs in that an individuals own tissue is confused as something foreign and the immune system attacks this "mislabeled" tissue. Common forms of autoimmunity include Multiple Sclerosis, Rheumatoid Arthritis, Lupus, and Vitiligo to name only a tiny fraction of autoimmune diseases. Elements of autoimmunity are likely at play in conditions as seemingly unrelated as Schizophrenia, infertility, and various forms of cancer.

Interestingly, all of these seemingly unrelated diseases share a common cause: damage to the intestinal lining which allows large, undigested food particles to make their way into the body. This is called "leaky gut and the autoimmune response". Here is a 7-part video series by Prof. Loren Cordain describing the etiology of Multiple Sclerosis. And please watch this TED talk by Dr. Terry Wahls, MD as she describes how she reversed her Multiple Sclerosis with a paleo diet. If you have an autoimmune disease you might consider trying the autoimmune protocol of the paleo diet. If you do, please tell us about your experience.

UNIT V. PIONEERS OF MEDICINE

HIPPOCRATES

Nationality: Greek *Dates*: c. 460-377 B.C.

Hippocrates is often called "the father of western medicine". He lived in ancient Greece and founded an important medical school on the island of Kos over 2,000 years ago. At that time, doctors – and Hippocrates was no exception – understood very little about the causes of illness. What Hippocrates did understand, though, was the importance of hygiene, rest and a good diet. He also observed his patients very carefully and wrote notes about their diseases. Books based on these notes influenced other doctors for centuries. In fact, even today, doctors still have to obey "the Hippocratic Oath". This is a list 'dos and don'ts' (правила) which describe a doctor's duty to his or her patients.

ANDREAS VESALIUS

Nationality: Belgian *Dates*: 1514-64

Medicine in Europe developed very slowly after Hippocrates. A famous doctor in the Roman Empire called Claudius Galen (c.130-c.200 AD) wrote over 500 books, but several of his theories about the human body were later shown to be wrong. One reason for this was that doctors weren't allowed to cut open dead bodies and examine them. As a result they understood very little about basic anatomy – the way in which bones, muscles, nerves and organs are made. The man who changed all that was a young Belgian. His name was Andreas Vesalius and he became a professor at Padua University in Italy when he was only 24. Vesalius did examine human bodies. In fact he paid people to remove them from graves. Sometimes he even went out at night and cut down the bodies of executed criminals himself.

In 1543 Vesalius published a book called "On the Structure of the Human Body". It had 300 illustrations and made anatomy a science for the first time in medical history.

AMBROISE PARÉ

Nationality: French *Dates*: 1510-90

Some of the most terrible injuries to the human body happen during wars. That was certainly true in the past and it's still true today. At least today, though, soldiers have modern medicine to help them. In the past, millions suffered in awful conditions. They included many whose injuries were so bad that they had to lose limbs. Thousands died from shock or loss of blood after operations in the Middle Ages. After the mid-16th century, though, the number of deaths began to go down. Why? Because of a French surgeon called Ambroise Paré. He discovered new and less painful ways to operate on wounded soldiers. But that wasn't Paré's only achievement. He was also one of the first doctors to make artificial arms, legs, teeth and eyes.

EDWARD JENNER

Nationality: British *Dates*: 1749-1823

The discovery which made this English doctor famous was vaccination. It's a simple idea it's saved millions of lives in the last 200 years – and this is how it works. When people catch a serious disease like polio, they have no defence against it – that's why they become ill. But if they receive a very weak form of the disease (not enough to make them ill) they produce special cells called anti-bodies. These last for years and defend the body when it's attacked by the disease itself.

Jenner first used vaccination against smallpox. In the 18th century this was a common disease which killed thousands every year.

What Jenner noticed, however, was that the girls who milked cows and often caught a very mild disease called cowpox never caught smallpox. Was the cowpox somehow protecting them against smallpox? To test his theory, he deliberately gave a young boy cowpox. Later, when the boy was exposed to smallpox, he didn't become ill. Jenner named his discovery *vaccination* after the Latin word for cowpox, which is *vaccina*.

FLORENCE NIGHTINGALE

Nationality: British *Dates*: 1820-1910

Between 1854-6 the Crimean War took place, with Turkey, France and Britain on one side and Russia on the other. One of the hospitals where injured soldiers received treatment during the war was in a place called Scutari. That's where 39 British nurses led by Florence Nightingale arrived from London in 1854. They were shocked by the conditions in Scutari.

The hospital was dirty, the food was bad and 42 per cent of the wounded soldiers were dying. Soon, though, all that began to change. In less than twelve months, Florence Nightingale and her 38 nurses turned Scutari into a clean, well-organized hospital. The result? By the end of the war, only two per cent of wounded soldiers were dying, not 42 % .

In 1856 Florence Nightingale returned to England, where newspaper reports about Scutari had made her famous. So famous, in fact, that the British people raised Ł50,000 to open a college for nurses at St. Thomas's Hospital in London. It was the first nursing school in the history of medicine.

LOUIS PASTEUR

Nationality: French *Dates*: 1822-95

Louis Pasteur was a professor of chemistry. He worked at Lille University and that's where he made his pioneering discoveries about bacteria. These are the tiny organisms which cause disease. Before Pasteur, no one in medical history had isolated and studied bacteria. It was vital work and opened the door to a completely new age of scientific and medical developments. Pasteur realized, for example, that the bacteria which make wine and milk go bad can be killed by heating them. That work led to the process called *pasteurisation* which is still used today. As for the bacteria which cause illness in human beings, Pasteur's discoveries made it possible to develop many new vaccines. Edward Jenner had vaccinated a small number of people against smallpox in the 1790s. Now, thanks to the work of Louis Pasteur, millions can be protected from a wide range of diseases.

JOSEPH LISTER

Nationality: British *Dates*: 1827-1912

Louis Pasteur's work on bacteria influenced many people, but it had a particular strong effect on Joseph Lister. Lister was a surgeon, and Pasteur's work gave him an idea. Perhaps it was bacteria which infected the wounds of so many patients during and after operations. To try to stop these "septic" infections, Lister experimented with a chemical called carbonic acid. He used it to kill all the bacteria... (a) on his own hands, (b) on the instruments he used during operations, (c) on the wounds of his patients. Lister's "antiseptic" experiments were a great success and made operations far safer than ever before.

SIGMUND FREUD

Nationality: Austrian *Dates*: 1856-1939

There are two kinds of illness – physical and mental. However, until the 19th century, doctors understood very little about mental illness. People who suffered from it were either sent to "madhouses" like London's Bedlam or given painful and completely useless brain operations to get rid of the "evil spirits" in their heads. The man who pioneered a totally new approach to mental illness was Sigmund Freud.

In his view, the human mind had two halves – conscious and unconscious. The conscious mind could be controlled and educated.

The unconscious mind, on the other hand, was far less logical and didn't obey external rules. It contained powerful childhood memories – it was the home of fears and fantasies - which it communicated in dreams. Freud used this last fact as the basis of his work. How?

By analyzing his patients' dreams and trying to understand what they really meant. Then, he used the results of his experiments to build a picture of the human mind and its illnesses. Some people agreed with his opinions – many disagreed – but one thing was clear... Freud's new approach, which he called psychoanalysis, had opened up a completely new area of medical research.

WILHELM VON RÖNTGEN

Nationality: German *Dates*: 1845-1923

The man who discovered "X-rays" was a German physicist and he made his discovery in 1895. What are X-rays? Well, basically they're invisible, very short rays which pass through some substances (e.g. skin) but not others (e.g. bone). This means that doctors can use them to take clear internal photographs of the human body.

When Röntgen made his discovery, he didn't understand exactly how it worked – that's why he called the rays "X-rays". For the last 100 years, though, they've helped doctors to painlessly diagnose their patients' internal problems more accurately than ever before in history. Röntgen won the Nobel prize for physics in 1901.

FRANCIS CRICK

Nationality: British *Dates*: 1928-

JAMES WATSON

Nationality: American *Dates*: 1916-

Two other Nobel winners were Crick and Watson. They received their prizes 61 years after Röntgen for the discovery of DNA. This is the substance inside every cell which controls that cell's identity. DNA is, in other words, the key to life itself. How does it work? Well, basically, what DNA contains is a complex list of chemical instructions. These pieces of genetic information tell each cell how to develop – i.e. to become a liver cell, a blood cell, a skin cell, etc. In the years since Crick and Watson's breakthrough, genetic research has made rapid progress. In fact, many experts are convinced that it will provide an exciting new range of treatments and cures in the 21st century.

CHRISTIAAN BARNARD

Nationality: South African *Dates*: 1922 - 30001

The world's firs heart transplant took place in Cape Town. The year was 1967 – the patient was 54-year-old Louise Washkansky – the pioneering surgeon was Christiaan Barnard. Sadly, Mr. Washkansky only lived for eighteen days after his operation, but Christiaan Barnard had proved that it was possible to put the heart of one human being into the body of another. These days, heart transplants happen almost every day. Not all of them are successful, but for many patients a new heart can mean several extra years of healthy life.

Exercise 1. Add some information, make up a small report and give a talk in class.

Exercise 2. Make up some dialogues from the information above.

Exercise 3. Write a small essay on the topic.

Exercise 4. Transfer the given information from the passages onto a table.

№	Activity			
	Who	When	Where	Score
1.				

MEDICAL PIONEERS

The following individuals are a selection of those responsible for some important firsts in medicine, from the discovery of "germs" to the foundation of molecular biology.

Edward Jenner (1749-1823): Vaccines

British surgeon and naturalist Edward Jenner developed the first vaccine, the smallpox vaccine, in 1796. Jenner was inspired to develop the practice of vaccination after noticing that milkmaids who caught the disease cowpox never developed smallpox. Jenner inoculated the son of his gardener with cowpox, and the boy failed to develop smallpox after being exposed repeatedly to infected smallpox material. This first vaccine laid the foundations for the field of immunology.

Elizabeth Blackwell (1821-1910): First female physician in the U.S. and U.K.

This British native was the first woman to receive a medical degree in the United States and the first woman on the UK Medical Register, a list of all practicing physicians in that country. After watching a friend die of what was probably uterine cancer around 1845, Blackwell decided to obtain her medical degree. She earned it from Hobart College in Geneva, N.Y., in 1849 and subsequently opened a practice in New York City. She was heavily involved in social change as well as medicine throughout her life and had such famous friends and correspondents as Florence Nightingale, Elizabeth Cady Stanton and Lady Anna Byron, wife of the poet Lord Byron.

Louis Pasteur (1822-1895): Germ theory of disease

Among his many claims to fame, French chemist and microbiologist Louis Pasteur was the first scientist to support the germ theory of disease, the idea that diseases are caused by microorganisms, with his research. Pasteur expended a lot of effort investigating what agents caused beverages like milk and wine to spoil, inventing his eponymic process "pasteurization" in the process. After discovering that microbes were responsible for sour wine and spoiled milk, Pasteur hypothesized that microbes also caused disease in the body. He later supported this theory in the mid-1860s by showing that a malady attacking silkworms in Alais, France, was caused by microbes attacking silkworm eggs.

Joseph Lister (1827-1912): Antiseptic surgery

British surgeon Joseph Lister is best known for applying Louis Pasteur's work in microbiology to pioneer antiseptic surgery. At the University of Glasgow in the 1860s Dr. Lister experimented with wound treatment with carbolic acid, then used to treat sewage, using Pasteur's studies of the germ theory of disease to guide his work. After successfully proving that carbolic acid-basedsterilization of wounds reduced gangrene, Dr. Lister went on to promote handwashing and surgical instrument sterilization as a means of reducing infection. His legacy in sterilization is also evident in the naming of a bacteria genus, a slime mold genus and Listerine, all of which are his namesakes.

William Osler (1849-1919): Specialty residencies

Canadian physician William Osler is known as the "father of modern medicine." One of the founders of Johns Hopkins Hospital in Baltimore, Md., Osler created the first specialty training residency program. He was also the first to put medical students through formalized bedside clinical training. In addition to his medical career, Osler was also a historian and an author.

Florence Nightingale (1820-1910): Nursing

Florence Nightingale, social reformer, statistician and healthcare pioneer, was the founder of modern nursing. The British native's claim to fame came during the Crimean War in 1854, when she and 38 other women were sent to minister to British soldiers. Finding an unhygienic, short-staffed hectic camp, Nightingale and her team reduced the death rate by 42 % to 2 %. A fund to train nurses for the war was established in her name in 1855. Nightingale went on to found a nursing school, write several texts on nursing and contribute to modern statistical analysis of sanitary reform.

Richard M. Lawler (1896-1982): Successful organ transplantation

Richard M. Lawler, MD, is best known for performing the first successful internal organ transplant, a kidney. He performed the transplant in 1950 in Chicago at Little Company of Mary Hospital. His patient was a 49-year-old Ruth Tucker, who suffered from polycystic kidney disease. The transplant was successful, though Ms. Tucker died from other causes five years later. While Dr. Lawler never performed another kidney transplant, his success paved the way for others to see the possibility of organ transplant as a viable treatment option.

Forrest M. Bird (b. 1921): Ventilator

Forrest M. Bird, MD, PhD, ScD, is an American pilot and inventor best known for creating the first reliable mechanical ventilators which are used in cardiopulmonary care. Dr. Bird began his career as a pilot, making his first solo flight at the age of 14 and earning his first aviation license at 16. By the time he enrolled in the Air Force at in 1941, he was qualified to be a technical air training officer. This qualification allowed Dr. Bird to fly nearly every plane the Air Force had to offer, including several that exceeded comfortable breathing altitudes. This experience prompted him to invent ventilation aids. In 1955 his work resulted in the release of the Bird Universal Medical Respirator, a pneumatic ventilator that is still in use around the world today.

Francis Crick (1916-2004): Molecular biology

Known most famously for being one of the four researchers who determined the double-helix structure of DNA, Francis Crick, PhD, is also a leader of the research team that discovered DNA is made of codons – amino acid triplets that encode genetic information. As a result of this late-1950s discovery, another research team was able to decipher the genetic code, leading to the birth of molecular biology and the understanding of the role genetics plays in human variation and health.

Exercise 1. Read the article on humanitarian, Clara Barton.

Clarissa Harlowe Barton was born on December 25, 1821 in North Oxford, Massachusetts.

She was the youngest of five children. In her long career of public service Miss Barton was successively a teacher, battlefield nurse, lecturer, and finally organizer and president of the American Red Cross. As a child Clara played nurse, taking care of pets that were sick or injured. When she was eleven her brother fell from a barn roof and Clara nursed him throughout a two-year convalescence. During the American Civil War Clara was a battlefield nurse. She delivered medical supplies and food, staying with the wounded until they were carried to safety. She was called the "Angel of the battlefield".

When the war ended in 1865, Barton established an information center that served war-torn families, located missing soldiers and identified and marked thousands of unmarked graves.

Miss Barton volunteered for the International Red Cross (IRC) while on a trip to Europe in 1870. She helped refugees of the Franco-Prussian War in Paris and other cities. She returned to America in 1873, and in 1877 IRC authorities invited her to establish an American Red Cross.

For the next 23 years, Barton organized and led the Red Cross, personally leading many relief expeditions to victims of forest fire, flood, hurricane and war. In 1904, at age 82, she resigned her post.

Barton spent the remaining years of her life at Glen Echo, Maryland, just outside Washington, D.C., where she died in 1912 at the age of 91. Her body was taken back to Oxford, Massachusetts for burial. Clara Barton will be remembered for her strong leadership of the American Red Cross, and her great philanthropic accomplishments throughout her life. If you are aware of books, movies, databases, web sites or other information sources about Claude Monet or related subjects, or if you would like to comment, please contact us.

Exercise 2. Choose the keywords that best convey the gist of the information.

Exercise 3. Make up some dialogues from the information above.

Exercise 4. Analyze the interview with Dr. Cooley.

THE INTERVIEW WITH DR. COOLEY

Dr. Cooley, were you a sort of budding scientist as a child? Were you very curious?

Denton Cooley: I think I was a curious child. I was interested in all of the biological sciences when I was a student in grade school. Eventually that curiosity developed into an interest in medicine.

Where did that curiosity come from?

Denton Cooley: My father was a dentist. His work interested me, and he was always willing to explain procedures and new devices. My older brother was sort of a naturalist, and together we pursued all sorts of activities that dealt with life itself.

So you liked being out in nature?

Denton Cooley: I really enjoyed nature. We did a lot of hunting and camping together, and it inspired me to major in the biological sciences when I entered the uni.

Dr. Cooley, were you very extroverted as a child?

Denton Cooley: No, on the contrary. I think I was very introverted and shy. I didn't participate in a lot of social activities in high school. I didn't have any dates in school. It was always sort of a joke that I had only three dates during my entire high school career, and those were with the same girl for the Christmas dance sponsored by our high school social club. The rest of the time, I did not have dates. I was more interested in sports, and the outdoors, than I was in the usual social activities.

Were you a particularly good student early on? Were you very motivated?

Denton Cooley: I was determined to make good grades. I was a straight "A" student, both in high school and in college.

What other interests did you have as a kid? What sports or hobbies interested you?

Denton Cooley: I was a varsity basketball player for four years at the University of Texas. I was on the championship Southwest Conference Basketball team. I also enjoyed golf and tennis, and other sports. I divided my time mostly between athletics and my studies. It was not easy for me to make straight A's in college and play varsity sports. But I was determined to do so, and I did. I graduated Phi Beta Kappa, with highest honors.

You probably didn't sleep a whole lot.

D. Cooley: I think I slept as much as some of my comrades. You do have to budget your time if you want to do these things in college. In my opinion, you should put your major emphasis upon your studies.

A surgeon needs tremendous self-confidence. Where do you think that confidence comes from? Did you always have this as a kid?

D. Cooley: No, I didn't. I think confidence is something you build gradually, with experience.

So even the shyness might have been a benefit in some ways, because it kept you working.

D. Cooley: I think so. By being shy, I steered away from a lot of the activities that most young people get involved with. I studied harder. I wanted to play sports too, but my emphasis was always on excelling.

When you were growing up, were there any particular books that inspired you?

Denton Cooley: As a child, I mostly read boys' magazines and books. I don't recall any particular book that really inspired me. During college, I enjoyed reading biographies, or fictional works based on real experiences. One book that influenced my decision to apply to medical school was *Miss Suzie Slagle's* by Augusta Tucker. That was a book about some young men living in a boarding house while they were going to Johns Hopkins medical school.

Did you decide you wanted to go there yourself?

Denton Cooley: Yes, I did. That book influenced me greatly to enter Johns Hopkins, and to live some of the experiences described in that book.

Exercise 1. Learn the dialogue by heart and carry it on with your classmate in class. Render the contents of the dialogue in Indirect Speech in English. Translate the dialogue paying attention to italic phrases.

Exercise 2. The American Academy of Achievement conducted interviews with Dr. Willem J. Kolff and Dr. William DeVries. Dr. Kolff, you describe yourself as an inventor. When did you know this is what you were going to do?

Willem Kolff: When I was very young I didn't see myself as an inventor, but I always wanted to make something. In the Netherlands, where I grew up, you go to school five and a half days a week. Saturday morning you go to school, but Saturday afternoons, my father allowed me to have lessons from a carpenter. I worked with the carpenter every Saturday afternoon for seven years. I had a great variety of interests. I loved animals. I had rabbits, pigeons, pheasants. I had a sheep, guinea pigs, and so on. When I was very young I wanted to become the director of a zoo. But my father pointed out that at that time there were only three zoos in the Netherlands. So your chances of becoming a zoo director were pretty small. My father was a doctor and, when I was very young, I didn't want to become a doctor because I didn't want to see people die. It's interesting that, later in my life, the main purpose of most of the machines I have made is to prevent people from dying. I immediately want to say, I don't want to prolong life when it is misery. I want to prolong it only when it is an enjoyable life.

When did you decide to become a doctor? Was there someone who encouraged you?

We'd like to ask the same question of Dr. DeVries.

What inspired you to become a physician?

William DeVries: I always really wanted to be a physician. Mainly it was the mystique of the heart. I was always enamored of the fact that the heart was supposed to be the seat of the soul, the site of love. Everything was the heart. As a child I had images of that and, and I got involved in it more and more. My mother was a nurse, and she gently encouraged me along this line. Dad was a doctor. He died shortly after my birth. I always kind of felt that I owed something to him. When I was in school, biology really excited me. I was really turned on and excited by dissecting animals. So things moved along in the direction of anatomy and biology. It was just a natural.

Any good experience that you remember that inspired you as a kid to pursue this?

William DeVries: I remember just being really excited about medicine, sitting in the doctor's office and asking him questions. This was in Preston, a town of about 5,000 people in southern Idaho. The old general practitioner was so nice, he would just help me all the time. But, the most vivid memory I have of medicine was when I was in the third grade. That was about the same time that all of my friends were getting their polio shots. These were the Cutter shots -- live attenuated polio virus -- and a lot of my friends started getting polio. The virus was still alive and it was giving them polio. Polio was in epidemic proportions at that time. I remember getting a febrile illness. It turned out to be pneumonia, but they said you've got to get to the big hospital. The only way they transported sick people was in a hearse. I remember it was from Webb Brothers' Mortuary, because I remember the little metal letters on the side of the hearse. They put me in this thing and took me on a four-hour drive to Salt Lake City. I remember being in the back of this hearse and looking through these velvet windows. So that little two-week incident in the hospital made a big impression on me.

Dr. Kolff, were there any teachers who had a particular influence on you when you were young?

Willem Kolff: In my very early years, no. I had some teachers that I liked, but the people that had a real influence on my life came a little later. During my studies at the University of Leiden, I became an Assistant in Pathological Anatomy. That old professor, whose name was Tenderloo, was a very scientific man. From him I think I learned the power of reasoning, to be critical about what you think and not assume something that may not be true and that is not proven.

When you were young did you read a lot? Were you good in school?

Willem Kolff: No. I was never very good in school. I had a lot of other interests than school. In the gymnasium – which you would call in the United States high school – it was very difficult. In the Netherlands, where I grew up, you had to learn four modern languages. I'm fluent in four modern languages. You also had to take six years of Latin and five years of Greek. You didn't have electives, you had to take everything. Apart from the later years of German occupation, which were very terrible, these high school years were perhaps the most difficult of my life. I was forced to do things that I did not really like to do, but I knew that it was necessary.

I knew I would always have one insufficient mark, so I switched it around so that my average at the end of the year was good enough for me to pass to the next class.

Exercise 3. Explain the best qualities which are important for a surgeon.

Exercise 4.Remember the names of medicians.

Andreas Vesalius

Who is the Belgian anatomist known as the Father of Modern Anatomy?

Gabriele Fallopius

Name the person who was an accurate dissector & named the falopian tubes, vagina, placenta.

William Harvey

This man discovered the heart as a muscular pump and is known to Modern England as its medical Shakespeare.

Hippocrates

Known as the Father of Medicine.

Galen

A Greek physician who migrated to Rome and known as the Prince of Physicians.

Galen

Considered the Father of Experimental Physiology and a champion of meical ethics saying physicians, "must learn to despise money."

John Hunter

An army surgeon expert in gunshot wounds and experimenting with tissue transfer, known as the Founder of Scientific Surgery.

Edward Jenner

A country physician from Dorsetshire, England who is considered one of the immortals of preventive medicine for his development of the smallpox vaccine.

Leopold Auenbrugger

Developed the use of percussion in diagnosis.

Ignaz Philipp Semmelweis

Directed that in his wards the students were to wash and disenfect their hands before going to examine the women and deliver the children.

Louis Pasteur

Saved the French wine industry through pasteurization. He also became involved in the prevention of anthrax which threatened cattle and sheep heards.

Josheph Lister

Reasoned that microorganisms must be the cause of infection and should be kept out of wounds.

Paul Ehrlich

German physician known for pioneering chemotherapy.

Crawford Williamson Long
The first to use ether as an anesthetic agent.
Florence Nightingale
The founder of nursing and known as the Lady with the Lamp.
Elizabeth Blackwell
The first woman to receive the Doctor of Medicine degree from a medical school.
Margaret Sanger
American leader of the birth control movement.
Jonas Edward Salk & Albert Sabin
Almost eradicated poliomyelitis with an injectable vaccine.
Christiaan Barnard
A South African surgeon that performed the first human heart transplantation.
Dr. David Ho
Helping to piece together the puzzel of the human immunodeficiency virus.
Dr. Slater
Currently serves as the senior vice president for worldwide policy at Pfizer Pharmaceuticals.
Dr. Antonia Novello
The first woman and the first Hispanic to be honored with the post of Surgeon General.

Exercise 5. Choose the word or phrase which best completes the sentences.

a. wounded injured damaged
Footballer Jimmie White was ____ in the second half of the match in a tackle with the goalkeeper.
b. sprained sore dislocated
He'll be out of the game for several weeks with a ____ shoulder.
c. a bandage stitches a sling
My daughter fell off her bike and she had to have ____ in her leg.
d. pain ache indigestion
Suddenly Tom felt a sharp ____ in his stomach.
e. bruises a rash warts
Whenever I eat shellfish I get ____ all over my body.
f. allergic to allergic with allergic from
Lots of people are ____ shellfish
g. a blister a blemish a boil
Ouch! I've got ____ on my heel from these new shoes.
h. drowsy tipsy dizzy
My husband hates heights. When he looks down he feels ____
i. run in run over run down
There's nothing seriously wrong with me. I'm just a bit ____ because I've been working so hard recently.
k. damages hurts injures
There's no doubt about it. Smoking ____ your health.

Exercise 6. Make up some dialogues from the information above.

Exercise 7. Render the main idea of the information.

SUSAN LAFLESCHE PICOTTE

Category: Frontier life, Social Activism, Medicine

Death Date: September 18, I9I5

State Contribution: Medical doctor, founded hospital, public health legislation

National Contribution: Indian rights spokesperson, health legislation

Susan LaFlesche Picotte, the first Native American woman to earn a medical degree, was born on the Omaha reservation near Macy in northeastern Nebraska in 1865. She was the youngest daughter of Mary and Joseph LaFlesche. Mary was a daughter of Dr. John Gale and Ni-co-mi of the Iowa tribe. Joseph, also known as Iron Eye, was a son of Joseph LaFlesche, a French trader and his wife, a woman of the Ponca tribe. Iron Eye was the last recognized chief of the Omaha.

Between 1870 and 1879 Susan attended school on the reservation. At the age of 14, she enrolled at the Elizabeth Institute for Young Ladies at Elizabeth, New Jersey.

Here she studied philosophy, physiology, and literature. After she was graduated in 1882, Susan worked at the Mission School on the Omaha reservation until 1884. Along with two of her sisters, she attended Hampton Normal and Agricultural Institute in Virginia from 1884 to 1886.

Susan then entered Women's Medical College of Pennsylvania at Philadelphia, receiving financial aid from the Women's National Indian Association. She was graduated, first in her class of thirty-six members, in 1889 with a medical degree. After interning for one year at Women's Hospital in Philadelphia, Susan returned to the Omaha reservation to become a physician for the government school. Later she became government physician for the Omaha Tribe. She was the only Indian ever appointed as a medical missionary by the Presbyterian Board of Home Missions.

In 1894 Susan married Henry Picotte. They were the parents of two sons. After her marriage, Dr. Picotte resigned from government school work and settled at Bancroft where she cared for her family and her ailing mother and also provided medical care for Indians and for her white neighbors.

In 1905 Henry Picotte died. The next year Dr. Picotte, along with her sons and her mother, moved to the new community of Walthill to live near her sister, Marguerite Diddock. The two sisters were active in the community, sponsoring religious and community activities.

Dr. Picotte was also active in medical organizations. She was one of the founders of the Thurston County Medical Association. As county health officer, she was involved in public health issues. She lobbied at the State Legislature for better public health laws.

As a member of the State Medical Association, Dr. Picotte worked to combat alcoholism among the Omaha, and she lectured in favor of temperance. Her father, Joseph LaFlesche, had worked successfully for temperance among the Omaha for many years.

In 1906 Dr. Picotte's work brought about in Washington, D.C. a stipulation that every property deed in communities on the Omaha reservation would prohibit the sale of alcohol. Dr. Picotte was an able spokesperson for her people, declaring that she would cooperate with the Indian Agencies in anything that was for the good of the tribe. She battled government bureaucracy and worked for economic, social, and spiritual advancement of Native Americans.

In 1912 a new hospital, built for Dr. Picotte with funds received from grants and donations, opened in Walthill. After Dr. Picotte died on September 18, 1915, the hospital was named in her honor.

The hospital existed until the late 1940s. Later it served as a care center for the elderly. In 1989 the building was restored and it now displays photos and artifacts from Dr. Picotte's life.

Named the Susan LaFlesche Picotte Center, it commemorates Dr. Picotte's medical work and her life, dedicated to the welfare of her people.

Because of Joseph LaFlesche's foresight, Susan LaFlesche Picotte and the other LaFlesche children were well educated. In order to work effectively for the welfare of the Omaha and other Native Americans, they adapted to the ways of the white culture around them. They truly lived in two cultures.

Exercise 1. Analyze the life and activities of Susan LaFlesche Picotte (1865-1915).

JONAS SALK'S LIFE & WORK

Were you interested in science as a child?

Jonas Salk: As a child I was not interested in science. I was merely interested in things human, the human side of nature, if you like, and I continue to be interested in that. That's what motivates me. And, in a way it's the human dimension that has intrigued me.

Were you a curious kid, about nature and that sort of thing?

Jonas Salk: I think I was curious from the earliest age on. There was a photograph of me when I was a year old and there was that look of curiosity on that infant's face that is inescapable. I have the suspicion that this curiosity was very much a part of my early life: asking questions about unreasonableness. I tended to observe, and reflect and wonder.

That sense of wonder, I think, is built into us. It's often said that the curiosity and wonder of childhood is sort of beaten down in us as we grow up. I don't think I shared it too much with others. I kept it pretty much to myself, and when I reached that age at which I could do something about it, then I did. So it was not suppressed or destroyed. It's that curiosity that bursts in childhood, during the period of play and creativity that reveals what we're trying to say.

That's the nature of the human being. That's what is the nature of the human species, as distinct from other species, where we see this enormous creativity because we are responsible for all that has been created, beyond that which nature has done.

Obviously, you were doing a lot of thinking at an early age. Did you get along with your classmates? Were you sociable?

Jonas Salk: I got along with my classmates, but I was not as sociable a child. I could spend time by myself and I still do. I would say that I spent more time alone than I did in social settings. Part of this was probably attributed to my mother's over-protectiveness, lest I hurt myself, or be injured in some way. How much of this is innate, and how much of this came about through that kind of nurturing, I can't say. Nevertheless, I did learn in time that I could spend time alone, as I do, walking on the beach. I spend time with others, of course, but also enjoy time with myself.

How did you decide to become a scientist? Did this happen in high school?

Jonas Salk: At some point, I recall having the ambition to study law, to be elected to Congress, and to try to make just laws, but I didn't pursue the study of law, for a curious reason. My mother didn't think I'd make a very good lawyer. And I believe that her reasons were that I couldn't really win an argument with her. This change took place between leaving high school and entering college. I entered college enrolled as a pre-law student, but I changed to pre-med after I went through some soul searching as to what I would do other than the study of the law.

My mother's preference was that I should be a teacher, but that didn't appeal to me. I was interested in science, and I began to think about the scientific aspect of medicine.

My intention was to go to medical school, and then become a medical scientist. I did not intend to practice medicine, although in medical school, and in my internship, I did all the things that were necessary to qualify me in that regard. I had opportunities along the way to drop the idea of medicine and go into science.

At one point at the end of my first year of medical school, I received an opportunity to spend a year in research and teaching in biochemistry, which I did. And at the end of that year, I was told that I could, if I wished, switch and get a Ph.D. in biochemistry but my preference was to stay with medicine.

And, I believe that this is all linked to my original ambition, or desire, which was to be of some help to humankind, so to speak, in a larger sense than just on a one-to-one basis. Just as I intended to study law, to make just laws, so I found myself interested now in the laws of nature, as distinct from the laws the people make.

How did your parents react to your decision to go into medicine & science?

Jonas Salk: Well, my parents were more than supportive, my mother particularly. My mother had no schooling. She came to this country from Russia in 1901. She immediately, as a young girl, began to work, you know, to help support the family. And, she was very ambitious in a sense for her children. She wanted her children to have more than she had, so that she lived her life and invested her life, lived through her children.

I was the eldest of three sons and the favorite and the one who had all of her attention.

Certainly until my little brother was born – I was about five years old then – and my youngest brother when I was about twelve. I was essentially an only child in the sense of having her interest and concerns and attention. She wanted to be sure that we all were going to advance in the world. Therefore we were encouraged in our studies, and overly protected in many ways. There was encouragement in general, but not particularly in any way, because there wasn't the same kind of culture that could lead to a particular orientation.

What did your father do?

Jonas Salk: My father was a designer of ladies' neckwear: blouses and things of that kind. He was a more artistic person. He was a designer in the garment industry, so to speak. He had not quite graduated from high school, only from elementary school. We were not brought up in a family which was already cultured. My mother's children and my father's children were the first of their respective generations that went on to college.

So, there was something special in the household that was very nurturing for – shall we say – advancing in the world, getting ahead. But whether it was in business or in law or in medicine, so to speak, was not of great concern. It's very inspiring that you didn't come from illustrious scientists, rather you can accomplish great things even if you are the first in your family to go to college.

Jonas Salk: Absolutely. There weren't any role models in my life, in that sense.

Exercise 1. Choose the keywords and phrases that best convey the gist of the information.

Exercise 2. Read the article on Jonas Salk's life and work.

Exercise 3. Analyze a brief biography of Dr. F. G. Banting.

Frederick Grant Banting completed his medical studies at the University of Toronto and established a surgical practise in London, Ontario, supplementing his income as a medical demonstrator at the University of Western Ontario. In London he conceived a technique which might permit isolation of the anti-diabetic component of the pancreas. He returned to the University of Toronto in 1921 to conduct experiments on the pancreas at the labs of Dr. J.J.R. MacLeod. By the time the summer had ended, he and Charles Best had isolated insulin.

Dr. J.B. Collip developed the process by which insulin was able to be refined and processed in sufficient amounts for clinical trials. Fame came quickly to the soft-spoken Banting who won the Nobel Prize for Medicine because of his discovery. Many honours followed, including knighthood, and Banting continued to work on further research and coordinated the National Wartime Medical Research effort. His efforts were cut short by a fatal crash in Newfoundland in 1941. The following represents an entry into Dr. Banting's diary, March 21, 1931.

It occurred to me when we were puffing up the hill and the train was speeding along away below that the engine with all its power could not go up that slushy, soft, snowy road as fast as we could. Power is useless unless directed in the proper channel. People have different powers and the big question in life must be – "Are we on the right road for travel?" We will certainly not get far in our given time unless we have chosen the road that is fitted to our particular locomotive.

Exercise 4. Make up some dialogues from the information above.

Exercise 5. Make up a small report and give a talk in class.

IAN WILMUT: LIFE & ACTIVITIES

How did you become interested in science? I understand your first interest was in farming?

Ian Wilmut: Actually even that was very indirect.

The first thing that I can remember wanting to do is to go into the navy. I don't clearly recollect whether it was merchant navy, or whether it was the military service. That came because of meeting a man who I admired immensely. He was a friend of one of my grandparents and he was a super man, and so I really admired him. So, in the age sort of coming up to 10 or 11 I suppose that was my ambition. Unfortunately, I'm slightly color blind, and color of course is involved signaling on boats, and so I sort of turned away from them. I think the initial reason why I became interested in farming is that I wanted to be outdoors. I've always enjoyed being outdoors. And so, I looked around and when I was at high school, probably 14 or so, my parents through friends arranged for me to be able to go work on farms on the weekend. I'm of course a city boy, in other words. I was born in Coventry, we moved to the West Riding of Yorkshire, which is industrial.

We lived in a woolen area, in an area where the mill was famous because it was the first in which the wool from llamas was used, alpaca. And so it was an industrial area. But I always enjoyed getting out. And I think it was through working with animals on the farm. I'm not particularly mechanically minded, so tractors never really attracted me at all. But, milking dairy cows, becoming familiar with dairy cows, understanding the biology a little bit, that's where the interest developed.

You were basically a farmhand?

Ian Wilmut: Yes, absolutely. I mucked out yards, and things like that, and as I got to be better known to them, I was allowed to milk the animals and so on, and really enjoyed that.

You've said you became interested in biology through doing those kinds of menial chores. What's the link?

Ian Wilmut: I think it was curiosity. The dairy cows giving birth, the calves and their problems, how the younger animals are trained. Certainly, the birth has always struck me as an extraordinary thing. We now live in a country area, and a number of years ago I went and assisted a friend at lambing time. It really is amazing every time. Of course, as a biologist I now know much more about what goes on inside the animal. The fact that that the whole animal comes from a single cell is really an extraordinary thing, and it's fascinating to try to understand it more.

But back then it was simply wanting to understand how to improve milk production, how to improve fertility, and the collection of milk

So you could have very easily become a dairy farmer.

Ian Wilmut: Absolutely, that was my expectation. I applied to a school of agriculture, with the thought of going overseas, to go to a developing country. That was something that my wife and I (my girlfriend then) discussed at that time.

What was your interest in that?

Ian Wilmut: That's a different challenge, and it's still there for young people today. There are thousands of hungry people around the world. Probably the biggest contribution that you can make to developing countries is in simple things we take for granted like fences, rather than the very high-tech things which I've become involved in. There's still a considerable contribution to be made by agricultural specialists, veterinary surgeons, bringing things we take for granted into these different environments.

Do you regret that you didn't follow through on that goal?

Ian Wilmut: In some ways, because we didn't travel, but overall no. I've been so fortunate in my research. I think that will actually contribute more, indirectly and over a long period of time, than I could have done in that other way.

Was there a pivotal event that turned you towards the area of biology & embryology?

Ian Wilmut: I can't remember what made me start thinking about it. Everybody did the same subjects in the first year at school, and then you specialized. I was most interested in animals, but I began to realize that I wasn't really a very practical person, and that practical agriculture probably wasn't the right thing for me.

It was a relatively unusual thing to do in Britain in those days, but I arranged to go and work in a lab for a summer project on a scholarship as an intern, which students here I think almost take for granted. Not quite, but it's well been built into the routines here. In Britain it is still not a routine thing, you have to work pretty hard to get them. And I was very fortunate to get a scholarship.

So, I went and worked in a lab for eight weeks, when the main function was just to do the ordinary tasks in the lab. But, there was obviously a responsibility on the senior scientists to talk to you, to explain to you what was going on and that was in my last holiday as an undergraduate and [this experience] utterly persuaded me that was what I wanted to do. They were trying to understand at that time how it is that an animal which has been mated knows whether or not she's pregnant.

Because if she's not pregnant, it's important that she comes back into heat and has another chance to mate and to conceive again. Whereas, if she is pregnant it's important that she stays pregnant. So it's obviously very subtle, but very important machinery. They were using the transfer of embryos from one animal to another to study this.

I became involved in the experimental procedures, worked with the animals, and for the first time saw embryos and assessed them. And these are -- you know, they're very small, a tenth of a millimeter across, but they're extremely beautiful little things, which grow into all of the different things and that's where the fascination in developmental biology and embryology came from.

Where did you see them? In a test tube?

Ian Wilmut: No, what you have to do in this sort of experimentation is to push sterile fluid through the reproductive tract to take the eggs out, and then to put them into a dish. You can only just see them with the naked eye, they're so small, one 200th of an inch roughly.

Looking at them with the naked eye, you'd just see a tiny little dot, like a period at the end of a sentence, and that's all. You can't tell anything about it, you can't move them about or anything.

If you put your flat dish onto the microscope, as you turn the magnification up, then you can begin to assess them. Usually by the time you transfer the egg it should have divided into a number of cells. You can see if that division has taken place and whether it's all even and whether the cells look normal. There's a shell around these things called the zone of pellucida, the clear zone, which shines in the light. The cells are darker, because they have fat in them. So you have these lovely single spheres to start with, which then divide into the smaller cells, which really look beautiful. I was learning from casual conversations in the lab, as well as from the work itself.

This will horrify people now, but this was before health and safety regulations came in, so we actually had coffee in the lab. This is, you know, absolutely illegal and not very safe, but at that time people didn't think about it. And, a cart went round the corridor every morning delivering tea, coffee and so on to people. And people – the senior person in the lab – would come out and we'd sit and talk, and it might be last night's TV program, or a game of cricket, or the girlfriends that we had – whatever it was – or science.

And, in my experience, this is where science makes progress often because somebody will put in an idea, or a new observation, and it sparks something else in somebody else's mind.

In my own experience, I think a lot of these things go on in your subconscious. I find myself saying something and almost seeing it go past and thinking, "Hey, that's a good idea." Apart from the social fun, this is also when scientific ideas get discussed. Somebody will develop a hypothesis in a conversation.

People still think of the lab as a pretty serious place.

Ian Wilmut: That's not my experience at all. When I first became a postgraduate student, there were a number of people who wrote essays like, "Science should be fun." Reproduction should be fun, because that's my specialty. If you're not enjoying it, if it's not fun, you should be doing something else. I'm sure that there are some jobs which are very boring, assembling cars for example. I can only imagine that the fun there comes from conversations with people, which is important in science, as well, but we have the privilege of doing something interesting as well.

Exercise 1. Read the interview with Ian Wilmut and try to understand his sphere of activities.

Exercise 2. Mach a person in A with a suitable lines from B and C.

A.	B.	C.
The nurse	performed	his knee.
The surgeon	suffered	her wrist.
The accident victim	had	in the smoky atmosphere.
The toddler	took	during the crossing.
The teenager	fell over and grazed	the patient’s temperature.
The pregnant woman	felt faint	a difficult operation.
The old man	felt sea-sick	in the attack.
The tennis player	sprained	on a stretcher.
The racing driver	was wounded	a heart attack.
The soldier	was carried	from sunburn.
The gardener	was stung	the crash.
The ferry passengers	was lucky to survive	by a wasp.
The holidaymaker		sports on her face.

Exercise 3. Which verbs go with which nouns and phrases? Match a line in A with a line in B.

A	B	A	B
whistle	a ladder	kick	a pile of books
tie	your head	climb	out of the window
scratch	a tune	chew	your grandmother
drop	a ball	hug	an ice-ream
lick	a toffee	stare	a knot

A	B	A	B
kiss	to pray	pat	about home
blow	into an apple	kneel	in time with the music
point	me on the back	hit	a gun at the bank clerk
think	up a balloon	bite	a nail with a hammer
clap	me on the cheek	hold	me in your arms

Exercise 4. Many of the verbs above form interesting idioms. Complete the gaps with one of the idioms. If necessary, change the form of the verb. The first letter of each missing word is given.

(*to drop someone a line; to kick the habit; to think the world of someone; to kiss something goodbye; to blow your own trumpet; to hit the roof; to hold your breath*)

a. The best way to stop hiccups is to h ____ your b ____ and count to ten.
b. My parents h____ the r____ when I said I’d been to an all-night party.
c. I’ve tried so many times to stop biting my nails, but I just can’t k____ the h____.
d. I've never seen a couple so in love. They clearly t_____ the w____ of each other.
e. When my teenage daughter learnt to drive, I had to buy her a car or k____ my own car g ____!
f. Tell your brother to stop b____ his own t____. We don’t want to hear how wonderful he thinks he is!
g. D ____ me a l ____ when you know what time you’re coming, and I’ll meet you at the station.

A VIEW OF FAST FOOD

I would like you to try a little thought experiment with me. Let's put our heads together to see if we ... perhaps pickles, high in sodium, and ketchup, high in sugar and sodium, will count as vegetables in our diet. From what I know about the scientific basis of human nutrition, I am quite sure that a diet of this sort though it will sustain life and growth, will also have tremendous consequences as people age. It will increase the frequency of degenerative diseases, lowering the age at which they appear, accelerating their progression, and worsening their severity. It will certainly promote obesity, hypertension, coronary heart disease, and cancer and probably will adversely affect liver, kidney, and brain function ... it might even make people less energetic and worsen their moods…

Thank you for indulging this exercise in fantasy. Now I have a real-world assignment for you. I would like you to visit three different fast-food restaurants of your choice, study the menus in them, and observe what the customers are eating. Then I want you to think about how closely those menus approximate the Worst Diet in the World we have just designedcan design the Worst Diet in the World, one that would be most likely to undetermined health and shorten life.

To begin, let's stuff it with calories, more than most people will be able to burn off, so that it will promote obesity. We should overload it with carbohydrate calories. That means lots of refined flour in fluffy breads and pastries, a lot of potatoes, sweets, and sweet drink…

For flat we will need a glut of saturated fat in the form of cheese, butter, cream, and other whole-milk products, along with a lot of beef and unskinned chicken. That will ensure that most people will develop unhealthy levels of cholesterol and increased risks of cardiovascular disease. We should also include plenty of fat in the form of margarine, vegetable shortening, and snack foods. We should also throw in some well-used cooking fat, consisting of cheaper vegetable oils.

As for protein, we should probably go for as much as we can eat and make it mostly commercially raised meat and poultry rather than fish or vegetable protein. That will maximize intake of drugs and hormones used to raise animals for meat as well as environmental toxins concentrated in their fat and other tissues. A lot of the meat in the diet should be processed (into hot dogs, lunch meats, and the like) to add more sodium, saturated fat, and unhealthful chemical additives. We should encourage everyone to drink cow's milk throughout life to make sure we affect the lactose-intolerant fraction of the population. The Worst Diet in the World should also be distinguished by what it does not provide. We will want very inadequate amounts of the micronutrients, especially those that protect the body from effects we are trying to achieve by the above selection of macronutrients.

The easiest way to make sure of that is to restrict fruits and vegetables. Of course, we will allow unrestricted amounts of floury potatoes (preferably French fried or otherwise prepared with quantities of margarine, butter, and sour cream) ... but we don't want people eating too many greens and brightly coloured fruits and vegetables...

Exercise 1. Analyze a view of fast food and agree or disagree with it.

Exercise 2. Say which parts of the body you use to do the following things?

Kick, bite, hit, climb, chew, drop, hold, hug, kiss, lick, clap, scratch, tie, stare, kneel, whistle, think, pat, blow, point.

Exercise 3. Transfer the given information from the passages onto a table.

№	Activity			
	Food	When	Where	Score
1.				

Exercise 4. Some pairs of adjectives are easy to confuse. Fill the gaps with the correct one.

unreadable illegible

a. I couldn't work out who the letter was from. The signature was _____.
b. I know Shakespeare is very popular but I find him totally _____.

childish childlike

c. Sarah is so _____. She's always having temper tantrums.
d. It was wonderful to watch the tiny lambs playing, I got such _____ pleasure from the experience.

sensible sensitive

e. Sophie is extremely _____ at the moment. Anything you say seems to upset her.
f. Karen is not a very _____ person. She wore high-heeled shoes for our four-mile walk.

true truthful

g. I've never known her to tell a lie. She's very _____ person.
h. I can never watch sad films that are based on a _____story. They always make me cry.

intolerable intolerant

i. Susan is so ________ of other people. She never accepts anyone else's opinion, and she always thinks she knows best.

self-satisfied self-centred

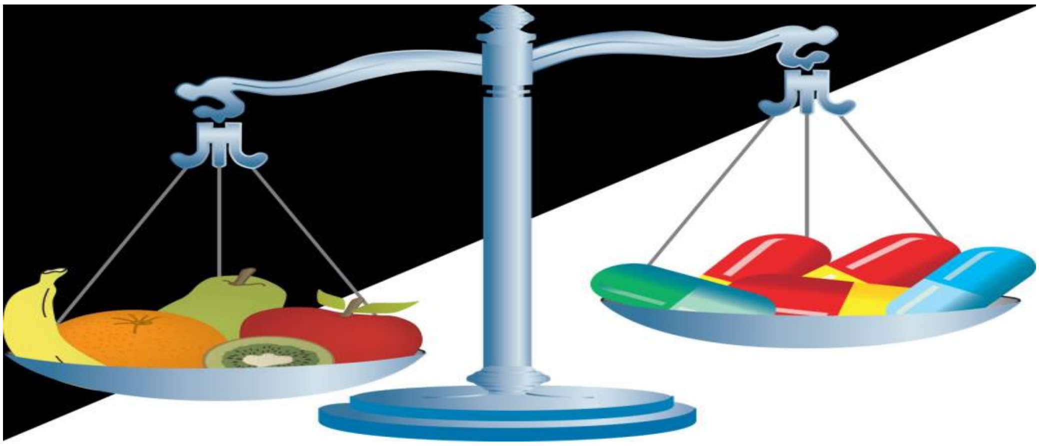
j. I find Mark's behaviour _____. It's unfair to be so selfish.

economic economical

k. We're having an _____ crisis at the moment. Lames has lost his job and I don't know how we are going to pay the mortgage.

safe safely

l. It's more _____ to drive slowly. You can do a lot more miles to the gallon.



CHAPTER II. GENERAL PRACTICE

UNIT I. VISIT TO POLYCLINIC

INTRODUCTION

Internal medicine is the medical specialty concerned with the diagnosis, management and nonsurgical treatment of unusual or serious diseases. According to some sources, an emphasis on internal structures is implied. In North America, specialists in internal medicine are commonly called, "internists". Elsewhere, especially in Commonwealth nations, such specialists are often called physicians.

Because their patients are often seriously ill or require complex investigations, internists do much of their work in hospitals. Formerly, many internists were not subspecialized and would see any complex nonsurgical problem; this style of practice has become much less common.

In modern urban practice, most internists are subspecialists: that is, they generally limit their medical practice to problems of one organ system or to one particular area of medical knowledge.

Gastroenterologists and nephrologists specialize respectively in diseases of the gut and the kidneys. Internists have a lengthy clinical and scientific training in their areas of medical interest and have special expertise in the use of prescription drugs or other medical therapies.

Internists are trained to diagnose severe, chronic illnesses and situations where several different illnesses may strike at the same time. They also help patients understand preventive medicines, men's and women's health, substance abuse, mental health, as well as effective treatment of common problems of the eyes, ears, skin, nervous system and reproductive organs. Most older adults in the United States see internists as their primary medical practitioners.

In the United States, there are two organizations responsible for certification of subspecialists within the field, the American Board of Internal Medicine, and the American Osteopathic Board of Internal Medicine. The training and career pathways for internists vary considerably across the world.

First, they must receive the "entry-level" education required of any medical practitioner in the relevant jurisdiction. Programs that require previous undergraduate education are usually four or five years in length. Hence, gaining a basic medical education may typically take eight years, depending on jurisdiction and university. Following completion of entry-level training, newly graduated medical practitioners are often required to undertake a period of supervised practice before the licensure, or *registration*, is granted, typically one or two years. This period may be referred to as, "internship" or "conditional registration."

Then, internists require specialist training in internal medicine or one of its subspecialties. In North America, this postgraduate training is often referred to as residency training; in Commonwealth countries, such trainees are often called registrars.Training in medical specialties typically takes from three to 10 years, and sometimes more, depending on specialty and jurisdiction.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Summarize the information briefly in English.

TOPICAL VOCABULARY

aid – 1) помощь, поддержка *Syn. assistance, help, support, succour, relief*
to extend (give, offer, provide, render) aid – предложить помощь
to get first aid – получать первую помощь
to come to smb.'s aid – прибегнуть к чьей-л. помощи
to cut off (withdraw) aid – отказаться от предложенной помощи
to administer (give, render) first aid – оказывать первую помощь
generous aid – великодушная помощь, щедрая помощь
urgent aid – неотложная помощь, скорая помощь
economic aid – экономическая помощь
economic aid to developing countries – экономическая помощь развивающимся странам
foreign aid – помощь зарубежных стран
government aid – правительственные дотации
legal aid for the poor – юридическая помощь малоимущим
domiciliary aid – помощь на дому
reducing aids – средства для похудения
She aided him in his work. – Она оказывала ему помощь в работе. He will aid if they will call. – Он поможет, если они позовут.
2) аппарат, устройство для людей с ослабленными органами чувств
deaf / hearing aid – слуховой аппарат
guiding aid – прибор для ориентации слепых
reading aid – прибор для чтения слабовидящими или слепыми
visual aid – аппарат, помогающий видеть
Emergency Medical Aid (Service) – скорая помощь
first aid box (kit) – санитарная сумка, аптечка
first aid station – пункт оказания первой помощи *Syn. ambulance room*
audio-visual aids – наглядные пособия
health aids – санитарно-гигиенические средства
training aids – учебные пособия
diagnostic aids – диагностические средства, средства диагностики
reference aids – справочно-библиографический аппарат
hearing aid – слуховой аппарат
behind-the-ear hearing aid – заушный слуховой аппарат
eye-glass hearing aid – слуховой аппарат в оправе очков
emergency medical aid – неотложная медицинская помощь
aid mission – миссия помощи
aid to families of dependent children – пособие многодетным семьям
aid-giving behavior – помощь; взаимопомощь

ambulance (car, lorry) – карета скорой помощи
ambulance service – служба скорой помощи
army ambulance – полевой госпиталь
ambulance box – походная аптечка
jeep ambulance – лёгкий санитарный автомобиль
medical ambulance – санитарный транспорт
to call in an ambulance – вызвать скорую медицинскую помощь
His wife called for an ambulance when he collapsed. – Его жена вызвала "скорую", когда он потерял сознание. He was taken to hospital by ambulance. – В больницу его привезли на "скорой помощи".

air ambulance – санитарный самолет ambulance boat – санитарный катер
flying ambulance – санитарный самолёт, летающий госпиталь
clinic (policlinic) – клиника (поликлиника)
diabetic clinic – клиника для больных диабетом
fracture clinic – травмопункт
dental clinic – стоматологическая клиника
clinic for women – гинекологическая клиника; женская консультация

clinical – клинический; бесстрастный, равнодушный
clinical death – клиническая смерть
clinical record – история болезни
She watched at his suffering with clinical indifference. – Она взирала на его страдания с холодным равнодушием.
clinical accumulation – клиническая достоверность
clinical aspects – клинические проявления
clinical chart – история болезни, карта больного
clinical deterioration – безуспешность лечения
clinical diagnosis – клинический диагноз
consulting-room – приемная врача *Syn. surgery*

hospital – больница, госпиталь
He's still in hospital. – Он все еще в больнице.
field (camp) hospital – полевой госпиталь
to be in hospital – лежать в больнице
to establish (found) a hospital – открывать больницу
to go to (the) hospital – ложиться в больницу
She works at / in the hospital. – Она работает в больнице. She's ill and has been in (the) hospital for a week. – Она больна и лежит в больнице уже неделю.
hospital for lepers – лепрозорий
children's hospital – детская больница
city (municipal) hospital – городская больница
hospital care – стационарное лечение
hospital (sheet) chart – история болезни
mental hospital – больница для душевнобольных
military hospital – военный госпиталь
non-profit (community) hospital – общественная больница
private (proprietary) hospital – частная больница
state hospital – государственная больница
to admit to the hospital – госпитализировать
voluntary hospital – благотворительная больница
teaching hospital – клиника при медицинском вузе
to walk the hospitals – проходить практику в больнице
I sat and pondered. I thought what an interesting case I must be from a medical point of view, what an acquisition I should be to a class! Students would have no need to "walk the hospitals", if they had me. I was a hospital in myself. All they need do would be to walk round me, and, after that, take their diploma. – Я сел и задумался: какой интересный случай я представляю с медицинской точки зрения! Ведь я находка для студентов! Им не нужно будет приходить в больницу на практику, имея дело со мной. я заменил бы для них целую больницу. Единственное, что студентам нужно было бы делать, – это ходить вокруг меня и после этого получить диплом.
hospital accommodation – количество больничных коек

hospital administration – организация больничного обслуживания
hospital bedding – госпитальное постельное имущество
hospital department – стационарное отделение
hospital emergency – больничная неотложная помощь

maternity home (hospital) – родильный дом
maternity leave – отпуск по беременности и родам, декретный отпуск *Syn. family (paternity, parental, adoption) leave*
maternity allowance – пособие по беременности и родам
additional maternity leave – дополнительный отпуск по беременности, родам и уходу за ребенком
compulsory maternity leave – обязательный отпуск по беременности и родам
ordinary maternity leave – обычный отпуск по беременности и родам
She was on maternity leave. – Она находилась в декретном отпуске.
maternity nurse – акушерка obstetrics ward – родильное отделение
maternity obstetric service – акушерский стационар
maternity patient – роженица, родильница
maternity ward – родильное отделение
maternity welfare center – женская консультация

public health – здравоохранение *Syn. health protection, health service, vacation resort*
public health adviser – консультант по вопросам здравоохранения
public health authority – орган здравоохранения

resort – 1) курорт *Syn. holiday resort, health resort*
summer resort – 1) дачное место 2) летний курорт
winter resort – зимний курорт
2) прибежище; средство спасения *Syn. refuge, comfort*
You are my only / last resort. – Ты моя последняя надежда на спасение.
3) обращение (к чему-л. / кому-л. как к средству спасения)
to have resort to smb. – обращаться к кому-л. (за советом, помощью)
4) сборище; скопление; толпа *Syn. assemblage, throng, crowd*
A great resort of men of talents now flocked around him. – Вокруг него теперь толпилась масса талантливых людей. rest-home – дом отдыха
last resort – последнее средство
in the last resort – в крайнем случае; в конце концов
I shall seek his advice, but it will be in the last resort. – Если я и обращусь к нему за советом, то только в самом крайнем случае.
What follows may only apply to myself. If it does, I am sorry, but it cannot be helped: in the last resort, a man can do no more than translate his own experience into words. – Все, что из этого вытекает, может относиться только ко мне. Если это так, то я очень сожалею, но поделать ничего не могу: ведь в конечном счете человек может выразить свой жизненный опыт только в словах и больше ни в чем.

to **resort** – 1) прибегать к (чему-л.), обращаться к (чему-л.)
to resort to threats – прибегать к угрозам
Poets sometimes resort to strange uses of the language. – Поэты иногда странным образом пользуются языком.
2) (часто) посещать, бывать, собираться (у кого-л., в каком-л. месте)
We resorted to the hotel for some coffee. – Мы заходили в отель выпить кофе.
resort wear – одежда для отдыха sanatorium – санаторий

sanatory (sanative) – санаторный; лечебный; целебный, оздоровительный
sanable – излечимый, поддающийся лечению

ward – палата pediatrics ward – отделение педиатрии
emergency ward – отделение скорой помощи
private ward – (отдельная) палата в частной клинике
Jim was admitted to the emergency ward with a wound in his chest. – Джим поступил в отделение неотложной помощи с раной в груди.
ward round – обход палат (врачом)
isolation ward – инфекционная палата, изолятор

medicine – 1) a) медицина; b) лекарство c) наркотик *Syn. drug* 2) колдовство, магия, чары
to practise medicine – заниматься врачебной практикой, быть практикующим врачом
to study medicine – изучать медицину
(aero)space medicine – аэрокосмическая медицина
traditional medicine – традиционная медицина
alternative (complementary, fringe) – medicine нетрадиционная медицина
homeopathic medicine – гомеопатия
clinical medicine – клиническая медицина
community (social) medicine – медицинское обслуживание как-л. района
folk medicine – народная медицина
forensic (legal) medicine – судебная медицина
family medicine – семейная медицина
molecular medicine – молекулярная медицина
occupational medicine – производственная медицина
physical medicine – физиотерапия
preventive medicine – профилактическая медицина
sports medicine – спортивная медицина
socialized medicine – государственная система здравоохранения
veterinary medicine – ветеринария
prescription medicine – лекарство, отпускаемое по рецепту
to take a medicine for cold – принять лекарство от простуды
to prescribe (a) medicine – выписать, прописать, назначить лекарство
cough medicine – лекарство от кашля
nonprescription (over-the-counter, patent, proprietary) medicine – лекарство без рецепта
strong medicine – сильнодействующее лекарство
to take medicine – стойко перенести что-л. неприятное
bad medicine зловещая личность
a dose (taste) of one's own medicine – палка о двух концах
to get (give) a dose of one's own medicine – отплатить той же монетой
medicine bottle – аптечный стеклянный сосуд
medicine chest – домашняя аптечка; ящик с медикаментами
medicine dropper – медицинская пипетка, капельница *Syn. pipette*
medicine glass – мензурка *Syn. graduate, measuring glass*
medicine man – 1) знахарь, шаман *Syn. sorcerer, wise man* 2) врач
medico – 1) врач, доктор, лекарь, медик *Syn. physician* 2) студент-медик
medico-legal – судебно-медицинский
medicobiologic – медико-биологический

medical – врачебный, медицинский
medical aid (care) – медицинская помощь
medical arrangement – медицинское обеспечение
medical attendance (service) – медицинская помощь, обслуживание

the medical profession – медицинские работники, врачи
medical garden – сад для выращивания лекарственных растений
medical jurisprudence – судебная медицина
medical examination (inspection) – медицинский осмотр
to have a medical – проходить медосмотр
medical assessor – судебно-медицинский эксперт
medical society – общество врачей
medical history – история болезни; история медицины
medical school – медицинская школа; медицинский вуз

ache – продолжительная боль
toothache – зубная боль
headache – головная боль
stomach-ache – боль в желудке
to have an ache – испытывать боль
dull ache – тупая боль, ноющая боль
persistent ache – постоянная боль, стойкая боль
steady ache – непрекращающаяся боль

He felt a dull ache in his shoulder. – Он чувствовал тупую, ноющую боль в плече. Poor posture can cause neck ache, headaches and breathing problems. – Неправильная осанка может вызывать боли в шее, головные боли и осложнения с дыханием. I have aches and pains all over. – У меня всё болит. I have a splitting headache. – У меня ужасно болит голова (разламывается от боли).

to **ache** – болеть, испытывать боль
to have an ache – испытывать боль
dull ache – тупая боль, ноющая боль
persistent ache – постоянная боль, стойкая боль
steady ache – непрекращающаяся боль

My ear aches. – У меня болит ухо. Which tooth aches? – Какой зуб вас беспокоит? He was aching all over. – У него всё болело. She was aching with weariness. – Её ломило от усталости. He felt a dull ache in his shoulder. – Он чувствовал тупую, ноющую боль в плече. Poor posture can cause neck ache, headaches and breathing problems. – Неправильная осанка может вызывать боли в шее, головные боли и сложности с дыханием. I have aches and pains all over. – У меня всё болит. My ear aches. – У меня болит ухо. Which tooth aches? – Какой зуб вас беспокоит? He was aching all over. – У него всё болело. She was aching with weariness. – Её ломило от усталости.

болеть; сострадать (кому-л.); переживать (за кого-л., о чём-л.)
My heart aches for him. – У меня сердце болит за него.
жаждать, страстно стремиться (к чему-л.)

She is simply aching to get back. – Она просто жаждет вернуться домой. I ached to see that race and those two horses run, ached and dreaded it too. – Мне ужасно хотелось посмотреть этот забег, особенно, как побегут те две лошади; я жаждал, но и боялся этого зрелища.

attack – приступ sham attack – ложная атака
He had a heart attack. – Он перенес сердечный приступ.
plan of attack – план решения задачи
to resist attack – быть стойким, сопротивляться воздействию

to **attack** – поражать (о болезни)
to attack right-brain – поражать правое полушарие мозга
to attack the problem – браться за решение проблемы

disease – болезнь *Syn. sickness*

acquired disease – приобретённое заболевание
acute disease – острое заболевание
common disease – распространённая болезнь
communicable (contagious, infectious) disease – инфекционное заболевание
congenital disease – врождённое заболевание
congenial heart disease – врождённый порок сердца
deadly (fatal, terminal) disease – смертельное заболевание
chronic disease – хроническое заболевание
incurable (untreatable) disease – неизлечимая болезнь
lingering (protracted) disease – затяжная болезнь
mild disease – лёгкая болезнь
occupational disease – профессиональное заболевание
rare disease – редкая болезнь
serious disease – тяжёлая болезнь
alcohol-related diseases – болезни от чрезмерного употребления алкоголя
the outbreak of a disease – вспышка болезни
to come down with (contract) a disease – заболеть
to carry (spread) (a) disease – распространять болезнь, заражать
to cure (a) disease – лечить болезнь
to eradicate (stamp out, wipe out) (a) disease – уничтожить, искоренить болезнь
to prevent (a) disease – предотвращать болезнь
a disease spreads – болезнь распространяется
desperate diseases must have desperate cures – при тяжёлых болезнях прибегают к сильным средствам
dog's disease – грипп
"Sick?" Alice asked and dropped the frying-pan back onto the stove. "Seriously?" "No-o, just a recurrence of some old dog's disease... " – Карл заболел? Элис уронила сковородку на плиту. – Опасно? – Н-нет. Всего лишь рецидив застарелой простуды.
the English disease –"английская болезнь", рахит
caisson disease – кессонная болезнь
genetic disease – наследственная болезнь
incapacitating disease – заболевание с потерей трудоспособности
notifiable disease – опасное инфекционное заболевание
radiation disease (sickness) – лучевая болезнь
water-borne disease – заболевание, передающееся через воду
diarrheal disease – заболевание, связанное с расстройством пищеварения
disease beyond cure – неизлечимая болезнь
disease of mind – психическое заболевание
disease activity – течение болезни
Metronidazole reduced disease activity in active disease. – Метронидазол ослаблял проявление заболевания в активной стадии.
disease incidence – заболеваемость, частота заболеваний
disease intelligence – выявление заболеваний
disease none – "здоров", "здорова", заболеваний не обнаружено
disease pattern – клиническая картина болезни
disease prevention – профилактика болезней
disease process – механизм заболевания
disease resistant – иммунный

diseased – больной, заболевший *Syn. sick;* болезненный, нездоровый
diseased appearance – нездоровый вид *Syn. morbid, unhealthy*

sickness – болезнь, заболевание
in sickness (and in health) – в болезни (и в здоровье)
sickness rate – заболеваемость
motion (sea, travel) sickness – морская болезнь; тошнота, возникающая при езде или в полёте
altitude (mountain) sickness – высотная, горная болезнь

pain – боль (особенно острая, внезапная)
acute pain – острая боль
chest pain – боль в груди
a pain in the knee – боль в колене
dull pain – тупая боль, ноющая боль
excruciating pain – мучительная боль
pain barrier – болевой порог
England's Cup hero is determined to play through the pain barrier. – Настоящий герой чемпионата Англии должен играть превозмогая боль.
piercing (stabbing) pain – пронизывающая боль
throbbing pain – пульсирующая боль
I feel some pain in the back. – Я чувствую боль в спине.
spasm of pain – приступ боли
stab of pain – внезапная, острая боль
twinge of pain – приступ боли
to allay (alleviate, ease, relieve, soothe) pain – ослаблять, облегчать боль
to be in chronic pain – постоянно испытывать боль
to bear (endure, stand, take) pain – сносить, терпеть боль
to cause pain – причинять, вызывать боль
to feel (experience, suffer) pain – чувствовать, испытывать боль
to feel a pang of pain – почувствовать приступ боли
to inflict pain on – причинять (кому-л.) боль
to remove pain – снять боль
I felt a sharp pain in my lower back. – Я почувствовал острую боль в нижней части спины. She was writhing in pain, bathed in perspiration. – Она корчилась от боли, вся в испарине. She cannot stand any pain. – Она не может переносить боль. She experienced constant pain. – Она постоянно испытывала боль.
горе, огорчение, страдание *Syn. suffering, grief*
grey eyes that seemed filled with pain – серые глаза, казалось наполненые болью
pain and pleasures of parenthood – родительские огорчения и радости
to save one's pains – экономить свои силы
to take (be at) pains, pains – прилагать усилия; брать на себя труд
She is at pains to point out how much work she has done. – Она очень старается обратить внимание всех на то, сколько она сделала.
кто или то, что создаёт проблемы *Syn. bother, headache, annoyance*
He is such a pain in the neck. – Он такой зануда. This practice of changing the clocks twice a year is a real pain. Many of us take the best part of a week to recover, especially in the spring when we "lose an hour". – Этот перевод часов два раза в год – сущее наказание. Большинство из нас потом почти целую неделю привыкают к новому времени, особенно весной, когда мы «теряем час». I've always wanted to have short hair – long hair's a pain in the arse. – Мне всегда хотелось иметь короткую стрижку, длинные волосы – это такой геморрой.

pains and penalties – наказания и взыскания
to have one's labour for one's pains – напрасно потрудиться
no pain, no gain – не попотеешь, не заработаешь
under pain of death – под страхом смерти

to **pain** – причинять боль; болеть *Syn. hurt*
My head doesn't pain me now. – У меня голова сейчас не болит.
мучить, огорчать *Syn. torment, torture, hurt, afflict, aggrieve, distress*
to pain smb.'s feelings – задеть, обидеть кого-л.
It pains me to have to say it. – Мне больно это тебе говорить.
Nothing pains like the truth. – Правда глаза колет. She's a real pain. – Она любого выведет из себя. This job is getting to be such a pain. – Эта работа мне начинает потихоньку надоедать. He's been a real pain lately. – Он тут в последнее время всех заколебал.
to give smb. a pain in the neck – надоедать, докучать кому-л.
idle folk take the most pains – "нерадивые делают вид, что стараются больше всех"
on (under) pain of smth.) – под страхом, под угрозой чего-л.
a pain in the neck – надоедливый, зануда
My boss is a pain in the neck. – Мой шеф кого хочешь может заколебать One woman's ideal husband is another woman's pain in the neck. – Идеальный муж в понятии одной женщины может вызвать только отвращение у другой. All you get is a pain in the neck. – Только нервы портишь и больше ничего. Writing letters is a pain in the neck to me. – Я ужасно не люблю писать письма. I find his mannerisms a pain in the neck. – Мне противно смотреть, как он тут кривляется.
to put a person or an animal out of pain – положить конец страданиям, убить из жалости

injection – инъекция *Syn. infusion*
hypodermic (intradermal, subcutaneous) injection – подкожное впрыскивание
intramuscular injection – внутримышечная инъекция
intravenous injection – внутривенное вливание
to administer (give) an injection – делать инъекцию
to get an injection – получить инъекцию
lethal injection – смертельная инъекция, эвтаназия
to give an injection (of penicillin) – сделать укол (пенициллина)

apoplexy – кровоизлияние в мозг
appendicitis – аппендицит
asthma – астма
blood poisoning – заражение крови
cancer – рак
chicken-pox – ветряная оспа, ветрянка
cold – простуда
cold in the head – насморк
complication – осложнение
cramp – судорога
drops – капли
diarrhoea – понос
fever – лихорадка
(the) flu – грипп *Syn*. Grippe
haemorrhage – кровоизлияние
heart disease – болезнь сердца
hot-water bottle – грелка
indigestion – несварение желудка

abscess (boil) – нарыв
arthritis – артрит
bleeding – кровотечение
bronchitis – бронхит
cholera – холера
cold in the head – насморк
constipation – запор
to cup – ставить банки
cups – банки *Syn. cupping glass*
concussion of the brain – сотрясение мозга
diabetes – диабет (сахарная болезнь)
diphtheria – дифтерит
scarlet fever – скарлатина
typhoid fever – брюшной тиф
gout – подагра
insomnia – бессонница
malaria – малярия
(the) measles – корь

nervous breakdown – нервный срыв
pneumonia – воспаление легких
plague – чума
rheumatism – ревматизм
sun-stroke – солнечный удар
consumption – туберкулез *Syn. tuberculosis*
mumps – свинка
quinsy – ангина
rash – сыпь
small-pox – оспа
typhus – тиф
whooping-cough – коклюш

inoculation (against) – прививка (от) *Syn. vaccination*

inoculation against tetanus – прививка против столбняка

to give an inoculation – делать прививку

vaccination – прививка оспы; вакцинация

to carry out (do) a mass vaccination against tuberculosis – проводить массовую вакцинацию против туберкулёза

compulsory vaccination – обязательная прививка

renewed vaccination – ревакцинация

vaccinationist (vaccinator) – вакцинатор

vaccine – вакцина living vaccine – живая вакцина

influenza vaccine – противогриппозная вакцина

polio vaccine – вакцина против полиомиелита

rabies vaccine – вакцина против бешенства

smallpox vaccine – вакцина против оспы

tetanus vaccine – противостолбнячная вакцина

yellow-fever vaccine – вакцина против жёлтой лихорадки

vaccine disease – коровья оспа

vaccine therapy – вакцинотерапия

mustard plaster – горчичник

ointment – мазь

skin ointment – кожная мазь

to apply (rub) an ointment into the skin – втирать мазь

soft petroleum ointment – вазелин

ointment stick – шпатель или палочка для мази

pill – пилюля

sleeping pills – снотворные таблетки

Since the 1970s there has been a movement to bring art into hospitals, to sugar the pill. – С семидесятых годов существует движение "Искусство – больницам", чтобы подсластить горькую пилюлю. Getting up that hill at night is the pill. – Ужасно неприятно подниматься по тому холму ночью. Those pills you smoke are terrible. – Как ты можешь курить такие вонючие сигареты? Don't be a pill, Bill. – Не будь занудой, Билл. Hey, toss me a pill! – Кинь мне сигарету с марихуаной.

apothecaries would not sugar their pills unless they were bitter – "аптекари потому и подслащивают пилюли, что они горькие"

a bitter pill to swallow – горькая пилюля, тяжёлая необходимость; оскорбление, унижение, с которым приходится мириться

to gild (sugar, sugarcoat, sweeten) the pill) – подсластить пилюлю

a pill to cure an earthquake – "пилюля от землетрясения" (жалкая полумера)

to swallow the (a bitter) pill – проглотить (горькую) пилюлю

You'll have to swallow the pill I'm afraid. There's no way out but to apologize. – Боюсь, что вам придется проглотить эту пилюлю – попросить извинения. Это единственный выход.

prevention – предупреждение болезни (профилактика)

Prevention is better than cure. – Предупреждение лучше лечения.

to **prevent** – предотвращать, предупреждать
to prevent the spread of disease – предупредить распространение болезни
Nothing shall prevent us from reaching our aim! – Ничто не сможет помешать нам достичь цели!
spoonful – ложка
a tea spoonful of the mixture – чайная ложка микстуры
heaping spoonful – ложка с верхом
level spoonful – ложка без верха
spoonful of salt – (полная) ложка соли
spoonful of every dish – небольшая порция каждого блюда
treatment – лечение, терапия, курс лечения
treatment allowance – пособие на лечение
treatment chair – кресло для осмотра и проведения лечебных процедур
treatment couch – процедурный стол или кушетка
treatment date – день начала лечения
treatment discontinued – прерванное лечение
to **treat** (for an illness) – лечить от (болезни)
Which doctor is treating you for your illness? – Какой доктор лечит вас от этой болезни?
treat with preservative – обрабатывать антисептиком
to treat a question – разрешать, рассматривать вопрос
to treat smb. as mud (beneath one's feet); treat smb. like a dog, like dirt – плохо обращаться с кем-л., обращаться хуже чем с собакой, не считать за человека; смешивать кого-л. с грязью
treatability – излечимость (больного)
treatable – излечимый
dentist – зубной врач
dentist's office – зубоврачебный кабинет
dentist's chair – стоматологическое кресло
dentistry – профессия зубного врача; лечение зубов *Syn. dental treatment*
rights to practise dentistry – право работать дантистом
dentition – прорезывание зубов *Syn. teething;* расположение зубов
Of all distinguishing characters, the dentition of an animal is one of the most important. – Среди отличительных признаков расположение зубов животного является одним из наиболее важных.
dentition fever – повышение температуры при прорезывании зубов
dentofacial anomaly – челюстно-лицевая аномалия
patient – больной, пациент
in-patient – госпитализированный больной
out-patient – амбулаторный больной
to cure a patient – лечить (излечивать) больного
to discharge a patient (from a hospital) – выписывать пациента (из больницы)
to handle (treat) a patient – лечить больного
ambulatory patient – амбулаторный больной
cardiac patient – сердечник comatose patient – коматозный больной
hospital patient – стационарный больной
mental patient – психически больной
private patient – частный пациент
transplant patient – больной, которому произвели пересадку
patient capacity – пропускная способность (больницы, госпиталя); число коек в больнице
patient day – койко-день
patient care institution – лечебное учреждение

patient compliance – соблюдение больным режима и схемы лечения
patient confidentiality – врачебная тайна
patient history (record) – история болезни; карта больного
patient safety – безопасность пациента

physician – врач, доктор *Syn. doctor, therapeutist, G.P.*(*general practitioner)*
allopathic physician – врач-аллопат
homeopathic physician – врач-гомеопат
osteopathic physician – врач-остеопат
practicing physician – практикующий врач
attending physician – лечащий врач, врач-ординатор
physician in charge – лечащий врач specialist – специалист
physician on shipboard – судовой врач
physician's assistant – помощник врача, фельдшер
amily physician – семейный доктор; врач общей практики
house physician – старший интерн больницы; врач, живущий при больнице;
3) врач при организации (в гостинице, на предприятии)
Time must be her physician. – Её исцелит время.
physician's bag – врачебная сумка
physician's office – кабинет врача, врачебный кабинет
physician's recognition award – сертификат врачам после курсов повышения квалификации
eye specialist – окулист *Syn. oculist*
ear, nose and throat specialist – отоларинголог
the chemist's – аптека
surgeon – хирург
obstetric surgeon – акушер, акушерка
to bandage – перевязывать
to be down with pneumonia – лежать с воспалением легких
to be operated on for (cancer, etc.) – перенести операцию (рака и т.д.)
to be put on sick-list – получить бюллетень (освобождение от работы)
to be X-rayed – пройти рентген
to bring down the temperature – сбить температуру
to catch (a) cold – простудиться to cough – кашлять
to check (measure) one's blood pressure – измерить давление крови
to cure – вылечить, излечить (от болезни)
Dr. Brown has cured her. – Доктор Браун вылечил ее.
He managed to cure that disease. – Ему удалось излечить эту болезнь.
to die { of some illness, hunger / from wounds } – умереть от ...
to examine a patient – осмотреть больного
to fall ill – заболеть
to feel feverish – чувствовать жар
to feel one's pulse – щупать пульс
to have a (bad) cold – (сильно) простудиться
to have a prescription made up – заказать лекарство (в аптеке)
to have a tooth filled / to have a filling } поставить пломбу   filling – зубная пломба

to have a tooth crowned – поставить коронку на зуб
to have a tooth (pulled) out – вырвать зуб
to heal – заживать, излечивать
The wound healed slowly. – Рана заживала медленно.
to keep one's bed – оставаться в постели, соблюдать постельный режим
to listen to one's heart(lungs) – выслушать сердце (легкие)
to make out a prescription – выписать рецепт
to prescribe some medicine – выписать лекарство
to recover – выздороветь, выздоравливать
to sneeze – чихать
to sound one's lungs (chest) – прослушать легкие (грудную клетку)
to take a treatment for (a disease) – принимать лечение(от болезни)
to take one's temperature – измерять температуру
to get a doctor's medical certificate (or a sick-note) – получить отпуск по болезни
to prescribe the necessary treatment – предписать нужный курс лечения
to sprain an ankle – вывихнуть ногу в голеностопном суставе
benign (*ant.* malignant) tumor – доброкачественная (злокачественная) опухоль
to be subject to colds (headaches) – быть подверженным простудам (головным болям)
to call in a doctor – вызвать врача to catch (the flu) – заразиться (гриппом)

ADDITIONAL EXPRESSIONS

I had an operation on my heart (ears) – Мне делали операцию на сердце (ушах).
to have a complication after an illness on one's heart – получить после болезни осложнение на сердце
The Hospital Accident and Emergency Unit – отделение неотложной помощи при больнице
He recovered slowly after his long illness. – Он медленно выздоравливал после своей длительной болезни. She recovered her eyesight. – К ней возвратилось зрение.
I am running a temperature. – У меня температура.
I am sick. – Меня тошнит. I feel seedy. – Мне не по себе.
I got an infection from him. – Я от него заразился.
I have a sore throat (eye) (a toothache, an ear-ache). – У меня болит горло (зубы, уши, глаз).
I have a pain in my back (side, etc.). – У меня болит спина (бок и т.д.).
It hurts (badly). – Очень болит. I'm aching all over. – Все болит.
It is hard to swallow. – Трудно глотать.
to land on one's feet – счастливо отделаться, удачно выйти из трудного положения
to put one's foot in(to) it – сплоховать; попасть впросак; совершить бестактный поступок
I'm used to footing it wherever I go. – Я уже привык всюду ходить пешком.
Who'll foot the bill for your stupid behaviour? – Кто будет отвечать за твое глупое поведение?
My foot is out of joint. – Я вывихнул себе ногу.
My head is swimming. – У меня кружится голова.
My nose is clogged up. – У меня заложен нос.
Where do you feel pain? – Где у вас болит?
The flu (quinsy) is catching. – Грипп (ангина) заразен.
What do you complain of? – На что вы жалуетесь?
I'm quite fit. – Я чувствую себя (вполне) хорошо.
My cheek is swollen. – У меня опухла щека.

Exercise 1. Analyze the topical vocabulary and learn it by heart and make up sentences with it.

Exercise 2. Add some information & make up a small report and give a talk in class.

HUMAN BODY

head – голова	mouth – рот	kidney – почка	arm – рука
face – лицо	tongue – язык	back – спина	hand – кисть
eyes – глаза	tooth – зуб	stomach – живот, желудок	finger – палец
nose – нос	jaw – челюсть	lower back – поясница	nail – ноготь
elbow – локоть neck – шея	ear – ухо throat – горло	shoulder-blade – лопатка chest – грудная клетка	toe –палец (на ноге) foot – ступня
lung – легкое	heart – сердце	shoulder – плечо	leg – нога
knee – колено	joint – сустав	muscle – мышца	brain – мозг

SUPPLEMENTARY & REFERENCE WORD & PHRASE LIST

to keep in good health – быть здоровым
to blow one's nose – высморкаться
purge / enema – клизма
to take sick – заболеть
indisposition – недомогание
chronic ailment – хроническое заболевание
common ailment – общее недомогание
minor ailment – лёгкое недомогание
after-effects (of a disease) – последствия (болезни) side-effects – побочные явления
tonic – стимулирующее средство
a murmur of the heart – " шумок" в сердце
to have a running nose – иметь сильный насморк
to brake a leg (an arm) – сломать ногу (руку)
to take one's blood count – сделать анализ крови
pain-killer (*colloq*.) – болеутоляющее средство
ailment – недуг
to feel one's pulse – прощупать пульс
tumor (growth) – опухоль
laxative – слабительное
sedative – болеутоляющее
to get over one's illness – преодолеть болезнь
to get well – выздороветь
to diagnose the case as... – поставить диагноз
to give instant relief – немедленно облегчить боль
to rinse one's mouth – полоскать рот

PROVERBS

An apple a day keeps the doctor away. – Ешьте каждый день по яблоку, и вам не нужен будет врач.
Good health is above wealth. – Доброе здоровье дороже богатства (денег).
What can't be cured must be endured. – Чего нельзя исцелить, то нужно терпеть.
Health is not valued till sickness comes. – Здоровье не ценится, пока не придет болезнь.

Exercise 1. Make up some dialogues from the information above.

Exercise 2. Translate the phrases with key phrasal word «eye».

To be all eyes; all my eye; an eye for an eye; to cut one's eye after (someone); eyes out; get one's eye in; half an eye; to have eyes for; in one's mind's eye; in the public eye; to keep an eye open (for); to keep one's eyes peeled; to look (someone) in the eye; to make (sheep's) eyes (at); more than meets the eye; to pick the eyes out (of); to see eye to eye; to lay (set, clap) eyes on; to close (turn, shut) one's eyes to; up to one's eyes; with a ... eye; having an eye to; with an eye to one's own interests; with an eye to reaching agreement; with one's eyes open; with one's eyes shut; all eyes are turned to smb.; visible to unaided eye; visible to naked eye; to blink one's eyes; to drop / lower one's eyes; to lift / raise one's eyes; to roll one's eyes; to squint one's eyes; to strain one's eyes; bulging eyes; glassy (artificial) eyes; eyes twinkle; eyes twitch; quick eye; eagle eye; good / strong eyes; weak eyes; easy on the eye; to cast an eye on smth.; to fix one's eye on smth.; to keep an eye on smth.; to rest one's eyes; to run one's eye over smth.; to the eye; to see smth. with smb.'s eyes; to please one's eye and plague one's heart; to spit in smb.'s eye; where are your eyes?

SUBSTITUTION PATTERNS

"What do you **complain** of, sir?" "I've got a splitting headache."
a terrible toothache
an awful ear-ache
a stomach-ache
a pain in my back

"Did you ever suffer from **malaria**, sir?" "No, never."
bronchitis
mumps
pneumonia

"Where's Jack? I can't see him anywhere." "Well, he isn't at work. He's down with **flu**."
quinsy
indigestion
pneumonia

"What will you recommend in the first place, doctor?" "In the first place you must have your **blood tested**."
lungs X-rayed
blood pressure measured

"Have you heard from Aunt Betty lately?" "Yes, certainly. She's **in hospital** now."
in a sanatorium
at a rest-home
at a health resort
in clinic

"What are these pills for?" "This medicine is for **rheumatism**."
those drops — a cough
these tablets — the flu
a bad digestion

"What specialist must I consult?" "You must see a **surgeon**."
an eye specialist
a dentist
a therapeutist

"How do I take all those pills, doctor?" "You should take them **twice a day**."
three times a day
every morning

"What is she doing there, I wonder?" "Well, she's taking a treatment for **pneumonia**."
stomach-ache
heart disease
high blood pressure
some illness

Exercise 1. Do substitution patterns and remember the models.


CONVERSATIONS

"Outch!" "What's the matter?"
"I've cut my finger."
"Oh, I'm sorry, come here, I'll bandage it."

"I don't like your cough."
"Yes, it's pretty bad; I just can't get rid of it."
"You've got to consult a doctor."
"That's what I'm going to do. I think I must be X-rayed." "Certainly."

"Oh, I do feel awful. Look at my cheek!"
"Your cheek is swollen. It is a tooth, isn't it?"
"Yes, the back one. I'll probably have to have it pulled out."
"But you'll have to wait till the swelling subsides."

"I have an awful toothache. It feels as if my lower jaw was falling to pieces."
"Would you open your mouth, please...Does the touch hurt?"
"Yes, very. It gives me a sharp pain."
"Well, no treatment will help your bad tooth. It has to be pulled out. You've applied too late."
"Anything will do so long as it stops the pain, doctor."

"Here you are, you'll feel much better with your tooth filled."
"You're just so right. How much do I owe you?"
"Just gratitude. All medical aid is provided free in our country."

"Please, give me a glass of water."
"Here you are. What's the matter with you?"
"My head is swimming."
"Here, lie down, you'll feel much better in a minute."

"You shouldn't muffle up the baby."
"I'm so much afraid of colds."
"Overheating will get him colds much easier."
"You're right, thank you, but I'm always trying to be on guard."

"Mum, A want an ice."
"You said in the morning you had a sore throat and it was hard to swallow your porridge."
"It isn't any more."

"Tell me your trouble, young man."
"Well, I must have caught cold. I've been sneezing and coughing all the time and on the top of that it's hard for me to swallow."
"Open your mouth, please, let me have a look at your throat...Your pulse, please...Now take off your coat and shirt, I'll listen to your heart and sound your lungs...Got a temperature?"
"Yes, but not very high – 37, 3."
"There's nothing serious the case with you. Just take care not to expose yourself and avoid draughts, keep the bed for a few days and take the medicine I'll prescribe you."

TOPICAL VOCABULARY

head – 1) а) голова б) жизнь

from head (heel) to foot – с головы до пят

to bare one's head – обнажать голову, снимать шапку

to bow one's head – наклонять, склонять голову

to drop (hang, lower) one's head – опускать голову

to lift (raise) one's head – поднимать голову

to move one's head – качать головой

to nod one's head – кивать головой

to shake one's head – отрицательно покачать головой

to toss one's head – вскидывать голову, встряхнуть головой

to hold one's head high – гордиться

taller by a head – на голову выше

good (strong) head – крепкая голова (способность пить, не пьянея)

a good head for heights – способность не бояться высоты

a bad head for heights – боязнь высоты

to win by a head – 1) опередить на голову 2) с большим трудом добиться победы

Our horse won by a head. – Наша лошадь опередила остальных на голову.

I comb'd his comely head. – Я расчесал его миленькую головку.

Proofs enough against this scoundrel, Fritz, to cost him his head. – Против этого негодяя, Фриц, достаточно фактов, чтобы это стоило ему головы.

в) головная боль (вызванная ударом или алкогольным опьянением)

I get one of those blinding heads. – У меня этот ужасный приступ головной боли. She was lying down with a head. – Она лежала с головной болью.

2) ум, интеллект *Syn. brain, poise, mind, mentality, intellect*

clear head – светлая голова

accounts which he kept in his head – счета, которые он держал в голове

to use one's head – соображать, хорошенько думать, шевелить мозгами

to cram (fill, stuff) smb.'s head (with nonsense) – набивать чью-л. голову чепухой

to have a (good) head (up)on one's shoulders – иметь голову на плечах

It is not your fault that you have no head for politics. – Не ваша вина, что вы совершенно не годитесь для политики.

cool (level) head – рассудок, спокойствие, хладнокровие

to keep a level (one's) head – владеть собой, сохранять спокойствие

to lose one's head – потерять спокойствие, выйти из себя

Heads I win, (and) tails you lose. – В любом случае я выигрываю. В любом случае ты проигрываешь. Those wise heads came to the conclusion that there was hope. – Эти мудрецы решили, что есть надежда. He's a hot head. – Он горячая голова, горячий человек.

acid head – кислотник (наркоман, сидящий на ЛСД)

Acids are such nice people they want to be friends with the whole world. – "Кислотники" такие замечательные люди – они хотят дружить с целым миром.

to bring smth. to a head – доводить что-л. до кульминации

to have an old head on young shoulders – иметь здравый смысл, быть не по годам умудрённым

to bring smth. to a head – обострять что-л.; вызывать кризис; доводить что-л. до конца, заканчивать что-л.

Matters have been brought to a head in the peace talks; tomorrow they will either succeed or fail. – Переговоры о мире вступили в заключительную фазу; завтра они закончатся либо успешно, либо ничем.

to do it (standing) on one's head – делать с лёгкостью

Right, old boy. Leave it to me. I can do this on my head. – Ладно, старик. Оставь это мне. Мне это раз плюнуть.

to do smb's head in – надоедать, докучать кому-л.; беспокоить кого-л.

to get one's head (mind) round smth. – понимать, брать в толк, постигать

Sacking me was illogical and I still can't get my head round it. – До сих пор не могу взять в толк, почему меня уволили. Для этого не было никаких причин.

to give a horse his head – отпустить поводья

to go to smb.'s head – 1) опьянить (об успехе)

They were all sober people, and the wine they had drunk went to their heads. – Все трое пили редко, и вино сразу ударило им в голову. Its freshness went a little to his head, so impregnated with ozone or iodine, or whatever it was nowadays. – У него слегка закружилась голова от той свежести, насыщенной озоном, или йодом, или как это теперь называют.

вскружить кому-л. голову (похвалами, кокетством и т. п.)

But alongside her hard efficiency Dinny could well perceive a strange almost feline fascination that would go to any man's head if she chose that it should. – Под напористой деловитостью Джин Динни чувствовала какое-то странное, хищное очарование – стоит ей захотеть, и она вскружит голову любому мужчине. The publishers had praised his novel pretty highly and it rather went to his head. – Издатели расхвалили его роман, и это вскружило ему голову.

целиком поглотить чьё-л. внимание

Unfortunately he can't spare you any time. He's very busy writing a book and it's gone to his head. – К сожалению, он не может уделить вам времени. Он очень занят, работа над книгой целиком поглощает его внимание.

to keep one's head above water – держаться на плаву; справляться с трудностями

to make head (progress) – продвигаться вперёд

by the head and ears – грубо, резко, насильно

head over ears – по уши

off one's head (insane or delirious) – вне себя; безумный

out of head – из головы; потерявший голову, обезумевший

to go out of one's head – сойти с ума, потерять голову

over smb.'s head – за чьей-л. спиной

above smb.'s head – выше чьего-л. понимания

per (A) head – на (с) человека; с человека

five shillings per head – по пять шиллингов с носа

head physician – главный, старший врач

to head off (back) – мешать, препятствовать, предотвращать (что-л.)

to head off a quarrel – предотвратить ссору

to get (take) it into one's head – вбить, забрать себе в голову

to keep one's head – сохранять спокойствие, владеть собой

one's head off – без конца, сколько влезет, вовсю, напропалую

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

Exercise 2. Translate the sentences with key phrasal word "head".

1. It might bring things to a **head**, one way or the other. 2. When will the crisis come to a **head**? 3. But it is time to draw to a **head** this somewhat lengthened discussion. 4. He's off his **head**. 5. Have you gone off your **head**? 6. I feel like going off my **head** when I think about it. 7. That girl has gone off her **head** about him. 8. His eyes were so shifty and bright we thought he was clean off his **head**. 9. A hundred times he had heard the old man spoken of as a little off his **head**. 10. In the morning when Andrew Masters came to see how he felt, Pledger was half out of his **head**. 11. And I told little Mona Fox about the broadcast, and the kid's nearly off her **head**. 12. They tell me Shawhead's near off his **head** with anxiety. 13. "How does he hope to get back across such difficult country at night like that?" Quartermain said. "He must be off his **head."** 14. Were not all these answers given out of his own **head**? 15. He paused, overcome by the consciousness that he had been talking over Ruth's **head.**

Exercise 3. Translate the sentences with key phrasal word «head».

1. She made me so nervous; I just kept on laying my **head** off. 2. "I'm still recuperating", I told her. The phone's been ringing its **head** off. 3. He's lost over his **head** in that poker game. 4. The hotel offers a New Years Eve special: room plus breakfast at two hundred and twenty five dollars a **head**. 5. He was **head** over ears in debt when he married her. 6. To **head** my rival off I indulged in a tremendous flirtation. You're heading for an accident if you drive after drinking alcohol. 7. Off the top of my **head** I'd say they were just trying to ensnare her. 8. Off the top of my **head** I'd suppose she acted on the spur of the moment. 9. He sat down and wrote the story off the top of his **head**. 10. He answered the questions off the top of his **head**. 11. I'm talking off the top of my **head** as I haven't the papers here. 12. I can't think of the answer off the top of my **head**. 13. Vin answered the teacher's question off the top of his **head**. 14. One's **head** off I just kept on lying my head off. 15. The phone's been ringing its **head** off. 16. I've been working my **head** off the whole week. 17. I was yawning my **head** off the whole evening. 18. The kid has been coughing his **head** off all morning. 19. As I picked up myself from the floor I saw a couple of boys laughing their **heads** off. 20. She was screaming her **head** off.

Exercise 4. Translate the sentences with key phrasal word «nose».

1. The child has a runny **nose**. 2. He was just a little thief and a **nose**. 3. "Do you know your way, to North Hill across the moor?" "No, I do not." "You only have to follow your **nose**." 4. In such matters you can't follow your **nose**. 5. The usher was told to look out into the audience and count **noses**. 6. The bombs landed right on the **nose**. 7. I bet twenty pounds on the **nose** on that horse. 8. They were there right on the **nose**. 9. He pays on the **nose**. 10. Clever Sane has **nosed out** a perfect place for our camping holiday. 11. I don't want our neighbour **nosing into** our affairs, so keep quiet about our plans. 12. That policeman should not be **nosing about** in our garage without a court order. 13. What was he **nosing about** for? 14. I ran straight before my **nose**, till I could run no longer. 15. That policeman should not be **nosing about** in our garage without a court order. 16. Our dog will **nose** out a rabbit anywhere it hides. 17. I thought of her **nosing** in my room for signs.

MEDICAL EXAMINATIONS

A medical examination is compulsory for all those wishing to enter an Institute. Olaf visited his neighbourhood clinic to get the necessary medical clearance.

When he arrived there were a few people waiting in the waiting room. They soon got to talk, since mutual sympathy among patients waiting for their turn at the doctor's has become proverbial.

They were discussing various ailments and cures and the latest innovations in radioactive treatment when the door opened and the nurse called: "Next, please!" The smile faded on Olaf's lips as he entered the dentist's surgery. When he was comfortably seated in the dentist's chair the dentist asked him: "What's troubling you (What's the trouble)?" And before he could reply that nothing was bothering him (that he had no complaint, that he had no toothache bothering him) the dentist made him open his mouth and began probing for cavities.

"Ah", he said finally. "Here's a cavity that needs filling, and here's a filling that will have to be changed. When did you have that filling? And who treated you then?"

While Olaf was racking his brain trying to recall all these details the dentist made a sign to the nurse and reached for the drill. Let us break off our description at this point, for the less said about drilling, the better. Having the sensation of drilling described is almost as bad as having the drill in your mouth and might be compared only with having your teeth pulled out (extracted). When it was all over the dentist gave Olaf a cup of some liquid and told him to rinse his mouth.

"What is this? Water?"

"No. It's a special mouthwash containing an antiseptic. You'll feel better after rinsing your mouth with it." Soon Olaf walked out of the dentist's surgery with what was meant to be a smile on his face. As he waited for his turn to be X-rayed he got into conversation with his neighbour.

"Will this examination take much time?" "Oh, yes. They're very thorough here. They listen to your heart and lungs, and then they check your kidneys, liver and stomach... They overlook nothing. And you've got to go through the necessary analyses, too. They'll make a blood test, check your blood pressure and put you through all the laboratory tests they find necessary. And once you are enrolled in the Institute they'll have you coming regularly for medical examinations and all sorts of inoculations against various diseases."

At this moment the X-ray specialist called Olaf in and told him to strip to the waist. Sooner than it takes to tell Olaf stripped to the waist and was X-rayed.

This was followed by an examination by the ear, throat and nose specialist who sat with his reflector pushed up against his forehead.

"What has happened to your throat? Where did you get that hoarse voice?"

"I must have caught cold. It was much worse a few days ago. I
Couldn’t stop sneezing and I had a splitting headache from blowing my nose so often." "Let me have a look at your throat. Say A...Ah! There's no inflammation. Is it hard to swallow?" "No, I can swallow all right, but my nose is all clogged up. First I had a running nose all week, and now it's clogged up."

"A few drops of menthol will give instant relief. When you get home, drink lots of hot tea with raspberry jam and hop (get, climb) into bed. I'd also advise you to put a hot water bottle at your feet and if that doesn't do the trick (help) try a scalding footbath. That should relieve the cold. Take care to avoid draughts or you'll be having an earache next. You must take care of that cold because complications can be very serious...If there's no improvement we'll have to hospitalize you. Here's the prescription for those menthol drops. And don't forget that cold is catching!"

When Olaf left the doctor's consultation-room he was beginning to suspect symptoms of every disease under the sun. The eye-doctor, whom he visited next, asked him why he was looking so glum.

"You walk as though you had one foot in the grave. You'd think people never had colds in their lives." He then sat Olaf down opposite a chart and made him read out the letter. Finally the examination was over and the doctor said, "Your eyesight is normal."

As Olaf was leaving, the doctor said, "I hope you get over your cold soon."

Next Olaf called on the therapeutist.

He began by feeling Olaf's pulse. Then the doctor gave Petrov a thermometer and told him to take his temperature.

"Sit still and keep it under your armpit until I tell you to take it out", the doctor warned. And while Olaf sat immovable the doctor began filling in the record of diseases in Olaf's medical history. It took some time. Finally he went through the list and said:

"You seem not to have missed anything, my dear fellow."

"That's right. Bad luck."

"Have you had any major operations?"

"I was operated on for appendicitis last year. And when I was a child I had my tonsils and adenoids removed."

"Did you have any bad after-effects?"

"No."

"Have you been laid up with anything serious lately?"

"No." After checking Olaf's temperature, which turned out to be normal, the doctor listened to Petrov's heart.

"Did anyone ever tell you you had a bad (weak) heart? Do you feel winded when going upstairs (when walking upstairs)?"

"No, why?"

"Well, you have a murmur of the heart. You'd better take care of yourself (you better look after your health) if you don't want to become a wreck and land in hospital. Do you do exercises (physical jerks) in the morning?"

"No."

"Well, you should. And have a cold rubdown every morning. That will keep you from catching cold. Then eat lots of fruit. Remember the saying, 'An apple a day keeps the doctor away.' I think that's all. And now the head doctor will probably want to see you". Petrov walked into the head doctor's office. The head doctor read Olaf's case history through carefully.

"By the way, did you have a blood-test?"

"Yes, the certificate should be in there somewhere. Here it is."

"That's normal. You see, your eyesight, hearing, teeth, blood pressure, etc. are rated normal. The doctor says you have heart trouble, but in a very mild form (a mild case of heart trouble). There's nothing to worry about if you take good care of yourself and do not over-indulge in sport. Otherwise your health is quite good."

The head doctor then made out a slip (certificate), which certified that the bearer had been examined by the medical commission and had been found physically fit to enter the Institute.

Exercise 1. Draw up some dialogues from the text and carry them on with your classmates.

Exercise 2. Try to understand the conversation.

"When were you operated on for your appendicitis?"

"Two days ago. They brought me here in an ambulance, you know. Had I been brought to hospital a little later I might have died of blood poisoning."

"How do you feel now?"

"I'm still a bit too weak and somewhat dizzy. But the doctor says I'll be picking up in no time. If everything goes well they will take out the stitches next Friday. ... Well, and how's everybody?"

"Thanks, all right. Asking how you are... I'll be leaving now. Hope to see you in a better shape soon, err?"

"Thanks a lot for coming round to see me. Good-bye."

Exercise 3. Render the contents of the text in Indirect Speech in English.

VOCABULARY NOTES

1. *Children's dispensary* – детская консультация

2. *to nip in the bud* – пресечь в самом начале (в зародыше);

e.g. The business of doctors is to prevent and cure diseases.

Syn. illness – недуг, болезнь

Word combinations: to suffer from a disease; complications after a disease; curable (incurable) disease; epidemic, catching, infectious disease.

3. *Note* that "*sanatorium*" is not quite the word for the Russian санаторий. The English "holiday health centre" would be closer, since a sanatorium to an English speaker would be a place you go to for a cure or for treatment when your health is really bad and something is fundamentally wrong.

To a Russian a sanatorium is a place you can go to spend your holiday, patching up your health, combining rest and treatment; it is a health resort.

4. *to stamp out* – зд. покончить, ликвидировать

5. *to take a high toll of human lives* – уносить большое число человеческих жизней, косить (о смерти) e.g. War takes a heavy toll of human lives.

6. *clearance* – проверка, контроль, справка e.g. No athlete is allowed to take part in tournaments without proper medical clearance.

7. *to have a toothache (a headache)* – страдать от зубной (головной боли);

ache – боль (особенно продолжительная, тупая, ноющая)

Syn. pain – боль (особенно острая, мгновенная, колющая)

Note."Pain" is much wider in meaning than "ache" and denotes suffering of mind or body. "Ache" generally is used only in the physical sense and can be easily located. It is a continuous (not a sharp and sudden) pain. People who suffer from rheumatism feel an ache in their bones, especially in bad weather. He has earache; it must be unbearable: he has not had a wink of sleep for two days. I was at the skating-rink yesterday for the first time this winter and now my body aches all over.

(b) A shot rang out. I felt a sharp pain in my shoulder and fell. I was wounded.

8. *mouthwash containing an antiseptic* – полоскание с дезинфицирующим средством

9. *to be enrolled in the Institute* – быть принятым в институт;

new enrolment – новый набор

10. *inoculations against a disease* – предохранительные прививки

Cp. injections – уколы; vaccination - прививка

11. *to strip to the waist* – раздеться до пояса

12. *inflammation* – воспаление

13. *to look glum* – мрачно выглядеть

e.g. "What is he looking so glum about?" "He failed in his examination yesterday."

14. *to take one's temperature* – измерять температуру

Cp. I had my temperature taken. I have taken my temperature.

Expr. to be running a temperature.

Word combinations: high, low, normal temperature; to rise, to fall, to drop (of temperature). e.g. I am running a temperature. It's rather high:38.7 (thirty eight point seven).

15. *I had my tonsils and adenoids removed* – мне удалили гланды и аденоиды.

16. *to be laid up* – свалиться, заболеть

17. *to feel winded* – задыхаться

18. *to have a cold rubdown* – обтираться холодной водой

19. *to be rated* – быть отнесенным к категории, степени

20. *the bearer (of a certificate)* – предъявитель (удостоверения, справки и т.п.)

Exercise 1. Digest the information briefly in English.

Exercise 2. Answer the questions.

1. What accounts for the substantial drop in the mortality rate in Ukraine? 2. What diseases have practically been done away with in our country? 3. What rights does our Constitution guarantee to our citizens in the way of public health services? 4. The saying has it that an ounce of prevention is worth a pound of cure. Now why is that true? 5. Why must cooks, waitresses, grocery assistants, etc. undergo periodical medical examinations? 6. Why do they make one go through a general medical examination before entering an Institute? 7. What are the ways of flighting an epidemic? 8. Is one right in assuming that if TB has been diagnosed in its early stages a complete cure is more easily achieved? 9. Have inoculations for TB (as a prevention for TB) been developed? 10. Does rheumatism give you a pain in the bones or in the muscles or both?

Exercise 3. Translate the words into Russian and learn them by heart.

Headache, temperature, pulse, tablet, prescription, affected, anxious, use, invalid, pneumonia, ambulance, infantile paralysis, appetite, to breath, thorough, stomach, to unfasten, throat, weight, medicine, remedy, thermometer, complication, wound, measles, quinsy, diphtheria, tuberculosis, rheumatism.

Exercise 4. Answer the questions.

1. What great scientists do you know who devoted their lives to combating disease? 2. Why are X-raying and various laboratory tests instrumental in the correct diagnosis of a case? 3. Which disease now seems to take the heaviest toll of human lives? 4. When were you ill last? Did you have to keep (to) your bed? Were you put on the sick list? Was the doctor called in? What did you complain of? What examination did the doctor give you (put you through)? Were laboratory tests called for? How did the doctor diagnose the case? What treatment did he prescribe? Did you make out any prescription? How long did it take you to get well? 5. Does your Institute have a special medical service of its own or do you have to visit the neighbourhood (local) clinic in case of illness? 6. Would they give medical clearance to a person wishing to enter an Institute if he suffered from a severe form of TB? Or if he had a bad heart? 7. Do bad teeth ever bother you? Has a bad tooth ever kept you awake all night? What did you do about it? 8. It always pays to have your teeth examined regularly (even when you have nothing to complain about) to nip tooth-trouble in the bad, doesn't it? Do you follow this rule in practice or do you just admit it's right in theory? 9. Have you ever had complications after a disease? Which did you take harder, the disease itself or the complications after it? 20. What treatment does a doctor usually prescribe to a patient suffering from the 'flu?

Exercise 5. Read the text and render the main idea of it briefly in English.

The National Health Service (NHS) in Britain

Every British citizen who works is obliged to pay weekly a certain amount of money to the National Health Service. The amount of money needed to run medical services is very big and a large part of the money comes not from weekly payment but from taxes.

Most of the people in Britain admit that the N.H.S. needs improving. Many doctors complain that they waste hours filling in forms, and that they have so many patients that they do not have enough time to treat them properly. Nurses complain that they are overworked and underpaid. Some hospital doctors work ninety hours a week and earn less than a docker who works forty hours.

Patients have to wait long at the surgery to see their doctor and when their turn comes the doctor can afford little time to examine them.

Many N.H.S. hospitals are old-fashioned and overcrowded, and because of the shortage of beds, patients often have to wait a long time for operations.

Exercise 6. Write out all phrases on the topic from the texts.

Exercise 7. Make up some dialogues from the information above.

Exercise 8. Read the passage and anwer the question: Which number do you call?

If an Englishman says that he is ill, he means that he has an illness, or is unwell. If he says that he is sick, he means that he feels so terrible that he can vomit. If a person is absent from work because of illness, he is said to be on sick leave. The damp English climate can lead to catching a cold or a sore throat. People consult doctors if they have a cough, a temperature, a headache or insomnia. The doctor usually examines the patient and prescribes some treatment, pills, tablets or some other medicine, which we can buy at the chemist's. In emergencies people in Great Britain call police, fire or ambulance on 999. Which number do you call in your hometown if you are in trouble or need specialized information?

Exercise 9. Answer the questions.

1. Is a man ill with the flu usually put on a diet? 2. In what cases is hospitalization a rigid must (and imposed if it is resisted)? 3. What diseases did you suffer from in childhood? 4. Do you know anybody who grew up without ever having measles (or whooping-cough)? 5. What do you usually do for a headache? 6. What diseases usually occur in order age only? 7. What are the symptoms of the grippe? 8. Have you ever tried any drops to relieve you of a badly clogged (up) nose? Were they any good (did they work)? 9. What must one do to get a pair of (eye) glasses? 10. What will an eye-doctor make you do to find out whether you are short- or long-sighted? 11. What happens if eyeglasses of the kind prescribed to you by the doctor are not to be bought ready made? Are eyeglasses made to order? 12. Does long-sightedness usually come with old age? 13. In what way does the lack of vitamins affect eyesight? Have you ever seen a person suffering from (afflicted with) night blindness? 14. What do you know about Professor Filatov's operations to restore eyesight? What made this outstanding eye specialist's name famous the world over? 15. What health protection measures are taken at your Institute? Do you have to undergo annual medical examinations?

Exercise 10. Read the text and explain the score of the title.

But hard work isn't bad for you

When I got into medical school at the age of 18, I was so fascinated by the possibilities of research that I used to get up at 4 a.m. and study, with very few interruptions, until about 6 p.m. I still remember my mother telling me that this sort of thing could not be kept up for long and would undoubtedly cause a nervous breakdown. Now I am 66. I still get up at 4 a.m. and work until 6 p.m. Yet I am perfectly happy leading this kind of life. "There is more to life than just work," many say today. Work is considered as something that wears you down, that produces stress.

It is true that biological stress causes many common diseases. But does this mean that we should avoid stress whenever possible? That we should avoid hard work because it is stressful?

Certainly not. Stress is the spice of life. It is associated with all types of activity and we could avoid it only by never doing anything. Besides, certain types of activities help to keen the stress mechanism in good shape, as exercise of your muscles keeps you physically fit.

Work, to define it, is what we have to do; play is what we like to do. To function normally man needs work as he needs air, food or sleep. To look forward to total automation is as senseless as looking forward to the day of test-tube babies. Man's characteristic feature is not his wisdom but his constant urge to improve his environment and himself.

Our aim, therefore, should not be to avoid work but to find the kind that suits us best. The best way to avoid stress is to select and activity, which we like and respect, and which is within our talents.

Work wears you out mainly through failure. Successful activity provides you with the feeling of youthful strength. I believe anyone can live long and happily by working hard as long as he loves his activity and is reasonably successful at it. Short hours are an advantage only for those who are not good at anything, have no particular taste for anything, and no hunger for achievement. These are the true paupers of mankind.

TOPICAL VOCABULARY

nose – нос   through the nose – через нос, носом

to pick one's nose – ковырять в носу
to speak through one's nose – гнусавить, говорить в нос
to wipe one's nose – утирать нос
nose bleeds – из носа течёт кровь   nose runs – из носа течёт
bloody nose – кровотечение из носа
to blow one's nose – сморкаться
to breathe through the nose – дышать носом
to have a good nose – иметь хорошее чутьё
a keen nose for absurdity – острое чутьё на глупость
as plain as the nose on one's face – совершенно ясно
to bet on the nose – поставить на победителя (на скачках)
to bite smb.'s nose (face) off – огрызнуться, резко ответить кому-л.
to cut off one's nose to spite one's face – действовать во вред самому себе
to get it on the nose – получить взбучку
to get it up smb's nose – раздражать кого-л.
to make a long nose – показать нос (кому-л.)
to make smb.'s nose swell – вызывать сильную зависть, ревность
to pay through the nose – платить бешеную цену, переплачивать
to turn up one's nose at smb. – относиться с презрением к кому-л.
to wipe smb.'s nose – обманывать, надувать кого-л.
a nose of wax – человек, легко поддающийся влиянию, "тряпка"
to follow one's nose – 1) идти прямо вперёд 2) руководствоваться чутьём
to count (tell) noses – подсчитывать голоса своих сторонников
to keep one's nose clean – не совать свой нос куда не следует
to poke (put, thrust) one's nose – совать свой нос не в свои дела
on the nose – точно at 10 o'clock on the nose – точно / ровно в десять часов (без опоздания)
That's right on the nose – Это совершенно точно
under one's (very) nose – под самым носом
before one's nose – прямо перед собой; куда глаза глядят

face – лицо, физиономия   full face – анфас half face – в профиль

to come (meet) face to face – встречаться лицом к лицу
to get face to face with a trouble – столкнуться с неприятностью
black in the face – побагровевший (от гнева, злости, усилий)
to put one's face on – делать макияж; храбриться
to keep a serious face – сохранять внешнюю серьёзность
straight face – бесстрастное лицо; невозмутимый вид
to draw (make, pull) faces – корчить рожи
to show a face – держаться вызывающе, нагло
to adopt (put on a / the) face of smth. – строить из себя кого-л.
on (in) the (first) face of it – судя по внешнему виду; на первый взгляд
to face the facts – прямо смотреть в лицо фактам
to face the music – стоически переносить трудности
to face about – менять своё мнение
to face out (down) – смело смотреть в лицо (кому-л., чему-л.)

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

RECREATION

Recreation or fun is the expenditure of time in a manner designed for therapeutic refreshment of one's body or mind. While leisure is more likely a form of entertainment or sleep, recreation is active for the participant but in a refreshing and diverting manner.

As people in the world's wealthier regions lead increasingly sedentary lifestyles, the need for recreation has increased. The rise of so called active vacations exemplifies this.

A few individuals view recreation as largely non-productive, even trivial. Excessive recreation is not considered healthy, and may be labeled as escapism.

However, research has shown that recreation contributes to satisfaction, and that the stress management aspects of it contribute to quality of life, health and wellness, happiness, and that the use of recreation as a diversion may have clinical applications to individuals with chronic pain and other health impairments. In some cultures and religions, recreation is encouraged on certain days and discouraged on others. For example, in Judaism, *Shabbat* is a day for recreation, study, and relaxation; many Christian churches also have Sabbath. However, others interpret Sabbath to be a day of worship without self-absorbed recreation. Becoming a recreation specialist often requires a bachelor of arts degree in recreation management.

A recreation specialist would be expected to meet the recreational needs of a community or assigned interest group. People with such degrees often work in parks and recreation centers in towns, on community projects and activities. Networking with instructors, budgeting, and evaluation of continuing programs are common job duties.

Most U.S. states have a professional organization for continuing education and certification in recreation management. The National Recreation and Park Association administers an examination consider a national standard for professional recreation specialist practices.

Work-life balance is a broad concept including proper prioritizing between career and ambition on one hand, compared with pleasure, leisure, family and spiritual development on the other.

As the separation between work and home life has diminished, this concept has become more relevant than ever before. Related but broader terms include "lifestyle balance" and "life balance".

Similar discrimination is experienced by men who take time off or reduce working hours for taking care of the family. For many employees today – both male and female – their lives are becoming more consumed with a host of family and other personal responsibilities and interests.

Therefore, in an effort to retain employees, it is increasingly important for organizations to recognize this balance. An increasing number of young children are being raised by a childcare provider or another person other than a parent; older children are more likely today to come home to an empty house and spend time with video games, television and the internet with less guidance to offset or control the messages coming from these sources.

No one knows how many kids are home after school without an adult, but they know the number is in the millions. Also, according to a study by the National Institute of Child Health and Human Development, the "more time that children spent in child care, the more likely their sixth grade teachers were to report problem behavior". The findings are the results of the largest study of child care and development conducted in the United States; the analysis tracked 1,364 children from birth.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Answer the questions.

1. What is recreation like? 2. How do a few individuals view recreation? 3. What do researches show? 4. How can you describe Shabbat? 5. What does it require to be a recreation specialist? 6. What would a recreation specialist be expected to do? 7. How can you characterize his common job duties? 8. How many states in the USA have a professional organization for continuing education and certification in recreation management? 9. What does Work-life balance concept include?

Exercise 3. Render the major idea in English on the text "Americans worry about relaxing".

Don't Worry! Take it Easy! Cheer up! Where There's a Will, There's a Way!

We say all these things to balance our emotions and gain strength. But it is not as easy as it seems. So, what's the answer? We cannot go and live on a desert island. There are lots of things we can do of course. We can take more exercise. We can eat less, smoke less, we can have a well-organized rest. But perhaps the most important thing we can do is to learn to relax.

Stress grows very slowly. It is made up of all the little things that make us tense, day after day, year after year. Every time we relax, every time we put our feet up, every time we have a cup of tea and a chat with an old friend we take away some of the tension, that causes stress. Americans worry about relaxing. They take classes to learn how to relax.

They read books that tell them how to "take it easy". Relaxing is a multi-dollar industry in the USA. So, why not master this skill and do it on your own (without paying much money)? But before you start think of what doctors say nowadays, "Too much relaxation is bad for you too."

Exercise 4. Translate the sentences with key phrasal words "eye" and "elbow".

1. He went at the job **eyes** out. 2. But take my word for it; these things are all my **eye** and Betty Martin. 3. The children were all **eyes**. 4. You could see that with half an **eye**. 5. You'd never overlook the fact if you had half an **eye**. 6. She has **eyes** only for him. 7. She had never laid **eyes** on him before. 8. I am up to my **eyes** this week. 9. He regards our success with a jealous **eye**. 10. You married him with your **eyes** open. 11. I could get home with my **eyes** shut. 12. That rude man **elbowed** me aside and got on the bus ahead of me! 13. She **elbows** her way into the best. 14. She **elbows** her way into the best social circles. 15. Qualified nannies are being **elbowed** aside in favour of untrained young girls. 16. I'm up to my **elbows** in special work. 17. Business is brisk just now and we are up to the **elbows** in orders.

Exercise 5. Remember that.

at one's elbow – под рукой; рядом; поблизости
to bend (crook, lift) the elbow – выпить, принять на грудь
to rub elbows with smb. – якшаться с кем-л. up
to the elbows in work – по горло в работе
to be out at elbows – ходить в лохмотьях; быть бедно одетым ; нуждаться, бедствовать
to elbow one's way through the crowd – прокладывать себе дорогу в толпе
elbow aside – выталкивать (кого-л.); заставить уступить место
out at elbow(s) – ragged or impoverished
to crook one's elbow (the little finger) – наклюкаться, нализаться
up to one's elbows (ears) – по уши, по горло
trick knee – поврежденное колено up to one's knees – по колено
on bended knees – стоя на коленях, коленопреклоненно
to bend one's knees — преклонять колени
to dislocate, wrench one's knee – вывихнуть колено
to bring smb. to his knees – поставить кого-л. на колени; унизить
to go to smb. on one's knees – упрашивать, умолять кого-л. (на коленях)
She learned the language at her mother's knee. – Она впитала этот язык с молоком матери.
on the knees of the gods – в руках божьих
to give a knee to smb. – помогать кому-л., оказывать кому-л. поддержку
knee by knee – рядом, касаясь друг друга knee to knee – напротив
to bend the knee to smb. – преклонить колена перед кем-л., покориться
hard as goat's knees – очень выносливый
on one's knees (bended) knees – на коленях, униженно, пресмыкаясь

AT THE DOCTOR'S

"Medicines are not meant to live on", an English proverb says. There is no denying the fact, we can only add that good health is better than the best medicine. And if your health is good, you are always in a good mood. You have "A sound mind in a sound body", as the old Latin saying goes.

Taking medicines is an unpleasant thing, of course, and if you want to avoid it, you should keep yourself fit. There is no doubt, if a person doesn't take exercises, he can easily catch an illness.

Certainly the progress of science is a wonderful thing, and I want to speak about the achievements of medical science. A hundred years ago there was no medicine for diphtheria, measles, scarlet fever, whooping cough and other infectious diseases. A lot of people suffered from pain and nobody could help them. But nowadays the situation has changed and our medicine has succeeded in treating patients for contagious diseases. You can always go and see a doctor, and you are sure he will examine you and give an advice. And if you have to have an operation he will send you to a hospital where they have all the necessary equipment.

If your teeth need attention, filling or extracting, or if you need false teeth, then you go to the dentist. If your eyes need attention, you go to the oculist, who will examine them, test your sight to see whether you are suffering from short sight or long-sight, and will write out a prescription, which you take to an optician, who will then make the necessary glasses for you.

Once my friend came to school as usual, but in two hours his unusual paleness attracted attention of his fellows. It was obvious that something was wrong with him. We advised him not to risk his health and see a doctor at once. The doctor asked my friend what was the matter with him. My friend complained of a headache and sore throat. He took his temperature, and it proved to be high.

Having examined my friend, the doctor found he had a bad cold, wrote out a prescription and told him to go home and stay in bed to avoid complications. My friend followed the doctor's instructions and in a week he felt much better and the doctor said he had fully recovered.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Learn the dialogue by heart. Render the contents of the dialogue in Indirect Speech in English.

At the doctor's

"What's troubling you?"

"I have a swollen thumb and it kept me awake all night."

"Hm....you've got a splinter there. We'll have to use the lancet to get at it. You should never neglect a splinter. It might cause an infection and pus (an abscess)."

The doctor removed the splinter, put on a pad of cotton wool and bandaged up the thumb.

"Don't remove the bandage. If you do, dirt will get in and your thumb will swell up again. And here's some ointment to keep the swelling down."

Exercise 3. Make up some dialogues from the information above.

TOPICAL VOCABULARY

mouth – рот, уста mouth (oral) cavity – ротовая полость

to close (shut) one's mouth – закрыть рот

to open one's mouth – открыть рот

to cram (stuff) one's mouth (with food) – набивать рот (пищей)

to rinse one's mouth – полоскать рот

Mouth waters. – Слюнки текут.

mouth mirror – стоматологическое зеркало

by word of mouth – устно, на словах

He had always a certain shyness in expressing himself by word of mouth but he found he could tell her, pen in hand, all sorts of things which it would have made him feel ridiculous to say. – Филип всегда робел, когда приходилось выражать свои чувства; но оказалось, что на бумаге он легко может высказать то, что стесняется произнести вслух.

to be down in the mouth – в унынии, павший духом, в плохом настроении, в подавленном состоянии; как в воду опущенный

have a big mouth – болтать, трепаться, быть трепачом

Why did you have to have such a big mouth and reveal all our private affairs? – Зачем тебе понадобилось трепаться о наших делах?

to keep one's mouth shut – держать язык за зубами, помалкивать

Keep your mouth shut and don't bother me. – Попридержи язык и не приставай ко мне. I thought, why not keep my mouth shut and accept the promotion? – Может, промолчать и принять это повышение? The big men can offer a dee a few hundred pounds to drop a prosecution, or keep his mouth shut. – У богачей всегда найдется сотня-другая, чтобы заткнуть рот полиции и замять дело. The United States is the only country in the world that can put its money where it's mouth is. – США – единственная страна в мире, которая может подкрепить свои слова делом. If this is such a good stock, you buy it. Put your money where your mouth is! – Если это надежные акции, ну и покупай их. А то ты только советуешь, а сам не покупаешь.

to put words into someone's mouth – заставить говорить то, что кто-то хочет

to run off at the mouth – больтать ни о чем

She's always running off at the mouth. – Она слишком много болтает. I wish you would stop running off at the mouth. – Ты можешь помолчать, наконец?! I always end up with a mouth breather on a blind date. – Когда я договариваюсь с незнакомой девушкой по телефону о встрече, всегда является какая-нибудь стремная чувиха.

back – спина broad back – широкая спина

back pain – боль в спине

with one's back to the door – спиной к двери

to arch one's back – сгорбиться; выгнуть спину

to do smth. behind the back of smb. – делать что-л. за спиной у кого-л.,

позвоночник *Syn. backbone, spine, spinal column*

to break one's back – сломать позвоночник

back of the head – затылок

back of the hand – тыльная сторона ладони

at / in the back of smth. – позади чего-л. from the back – сзади

at the back of one's mind – подсознательно

back to back – вплотную, впритык

to be at the back of smth. – быть тайной причиной чего-л.

to break the back of smth. – закончить трудоёмкую часть какой-л. работы

to get / put / set smb.'s back up – рассердить кого-л.; раздражать кого-л.

to know the way one knows the back of one's hand – знать как свои 5 пальцев
to turn one's back (up)on smb. – отвернуться от кого-л.; покинуть кого-л.
with one's back to the wall – в безвыходном положении
to be on one's back – лежать (больным) в постели
to be (flat) (lie, thrown) (down) on one's back (lie on one's back)) – быть положенным на обе лопатки; быть беспомощным
to step back – шагать назад
back and forth – взад и вперёд
to answer back – дерзить, грубить (в ответ)
to love back – отвечать взаимностью
to pay back – отплачивать to talk back – возражать
to write back – написать в ответ
to go back from / upon one's word – отказаться от обещания
back to square one (to back the wrong horse) – сделать плохой выбор, просчитаться
as soon as one's back is turned – за спиной кого-л., в чьё-л. отсутствие
to back away – отступаться, отказываться (от чего-л.)
chest грудная клетка chest pain – боль в грудной клетке
weak chest – слабые лёгкие chest pain – боль в груди
chest trouble – хроническая болезнь лёгких
to beat the chest – бить себя кулаком в грудь
to throw out one's chest (with pride) – выпячивать грудь вперёд (от гордости)
chest compression – непрямой массаж сердца
to get smth. off one's chest – чистосердечно признаться в чём-л.
to play cards close to one's chest – держать (что-л.) в секрете, держать язык за зубами
chest capacity – объём грудной клетки chest cavity – грудина
surgeon's chest – чемоданчик с хирургическими инструментами
chest clinic – клиника грудной, торакальной хирургии
chest distortion – деформация грудной клетки
chest examination – исследование органов грудной клетки
chest operation – операция на органах грудной полости
chest-foundering – одышка

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

Exercise 2. Translate the sentences with key word "back" into your native language.

1. The cat arched its **back**. 2. He put his **back** into the task. 3. He's flat on his **back** after a long succession of failures. 4. I am still "on my **back**" awaiting a decision from Washington. 5. He had shot his bolt, and shot it hard, and now he was down on his **back**. If he hadn't starved himself, he wouldn't have been caught by la grippe. 6. **Back** from the door! 7. He was apologizing **back** and forth. 8. When he went home, he argued it **back** and forth in his own mind until he fell asleep. 9. Now we're **back** to square one. 10. Well, it looks like it's **back** to square one. 11. As soon as his **back** was turned the air felt lighter. 12. I could see she was **backing** away from the idea.

\

TOPICAL VOCABULARY

jam – челюсть edentulous jaw – беззубая челюсть

lower jaw – нижняя челюсть to get into jam – попасть в переплёт

to have jam on it – жить в достатке, преуспевать

ear – ухо, ушная раковина by the ears – в ссоре; на ножах

to wiggle one's ears – шевелить ушами

ear arm – дужка у очков inner ear – внутреннее ухо

middle ear – среднее ухо outer ear – наружное ухо

to have smb.'s ear – пользоваться чьим-л. благожелательным отношением

to gain the ear of business and political leaders – привлекать на свою сторону деловую и политическую элиту

up to the ears – по уши, полностью (занятый) (чем-л.)

to be on one's ear – быть раздражённым

to bring a storm about one's ears – вызвать бурю негодования

to give ear to smb. – выслушать кого-л.

to have long (itching) ears – быть любопытным

to keep one's ears open – прислушаться; насторожиться

to perk (prick, cock) up one's ears – навострить уши to strain one's ears – напрягать слух

to pierce smb.'s ear – оглушать

to set smb. by the ears – рассорить кого-л.

to close one's ears to smth. – не прислушаться к чему-л., пропускать что-л. мимо ушей, быть глухим к чему-л., делать вид, что не слышишь

to come out of one's ears – стать известным кому-л.

dry behind the ears – зрелый, оперившийся, взрослый

to fall on smb.'s ear – привлечь чьё-л. внимание

to get smb. up on his ears – привести кого-л. в бешенство, в ярость

it's as much as one's ears are worth – это дело рискованное

to keep one's ears open – быть настороже, начеку, держать ухо востро

to be all ears – слушать с напряжённым вниманием

to be on one's ear (be (или get) on one's ear) – возмущаться, взбелениться

to bend an ear to – прислушиваться, выслушивать

throat – горло, гортань; глотка *Syn: larynx* clear throat – чистое, невоспалённое горло

inflamed (red) throat – воспалённое, красное, больное горло

strep throat – стрептококковое воспаление горла, острый фарингит

sore throat – больное горло, боль в горле; фарингит, ангина

to cut one's own throat – "самому себе перерезать горло", действовать во вред себе, погубить себя; подрубать сук, на котором сидишь

to stick in one's throat – застревать в горле (о словах); претить

to catch by the throat – брать, взять за горло, принуждать, притеснять

to cram smth. down smb.'s throat – навязывать кому-л. что-л.

to cut each other's (one another's) throats – перегрызть друг другу глотки, смертельно враждовать; разорить, погубить друг друга конкуренцией

to cut the throat (of smb.) – погубить, уничтожить, разорить кого-л.

to jump down smb.'s throat – затыкать рот кому-л., перебивать кого-л. возражениями, запальчиво возражать, не давать кому-л. слова сказать

to thrust (ram, force) smth. down smb.'s throat – силой навязать что-л. кому-л.

to cut one another's throats – перегрызться, переругаться

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

Exercise 2. Read and translate the text; retell it in the form of a dialogue: a) between John and his mother b) between Dr Dixon and John.

On Monday John came home in the evening looking pale and tired. He told Mother that he had felt terrible all day. First of all he had had a headache since about ten o'clock in the morning. He had tried taking a couple of aspirins but they had not had any effect. He had also had a cough for several days and now his chest felt painful. He couldn't remember feeling as bad as this. He didn't want to do anything – all he wanted to do was to go to bed, and this he did.

Mother felt his forehead – it felt hot as if he had got a temperature. She thought he had caught 'flu, so she went into the kitchen and made him a warm drink. When it was ready, she brought it in to him but John was asleep. She put an extra blanket on the bed. John's breathing was heavy and his face was flushed. She couldn't remember that she had ever seen him looking as ill as this. She remembered that he had forgotten to take his overcoat with him that morning although the weather had been cold and windy. And he had had a cold ever since New Year's Eve. The next morning John was no better. Mother rang up the doctor and asked him to call at the flat.

At a quarter past twelve there was a ring at the doorbell. It was Dr Dixon, the local G.P. The first thing the doctor did was to stick his thermometer under John's tongue. When he took it out, he exclaimed, "You've got quite a temperature there. Now let's examine your chest. "Dr Dixon produced his stethoscope from his bag and started listening to John's breathing. Finally he said, "I'm afraid you might be suffering from pneumonia. You'd better go into hospital."

Note: G.P.(General Practitioner) – терапевт .

Exercise 3. Read the story without ending and explain the title.

The ambulance stopped in front of a hospital in downtown Chicago. Two male nurses rushed an unconscious man into the Intensive Care Unit. A staff doctor examined the patient thoroughly. He started with his head, eyes, ears, nose, mouth, moving the jaws. Picking up a stethoscope from a nearby tray, he listened to the heart, then for breath sounds on both sides of the chest.

The man's lungs seemed to be all right. He went on to the arms and legs, flexing each one, then the feet to see if there was a bone fracture. No artery or nerve was hurt or injured.

One of the surgeons on duty called for a portable X-ray machine. Soon he was studying the film of the abdomen. He saw that the kidneys were all right but there was some trouble with the liver.

The doctors agreed that the patient must undergo an operation. He was taken into the operating room. In an hour's time the operation was over and the man was admitted to a ward.

One morning a week later a policeman came to the hospital and asked the doctor on duty if he could see the patient, Mr. Kirk. "You remember, doctor, I came here the day Mr. Kirk was brought here. Then you said I should come back in a week's time to ask Mr. Kirk a few questions."

"Now he is in good shape and he'll be able to answer your questions, sergeant. Come with me." When Doctor Hamilton opened the door of the ward, he saw that Mr. Kirk's bed was empty. Nobody had slept in the bed that night.

TOPICAL VOCABULARY

tooth – зуб crown of a tooth – коронка зуба
neck of a tooth – шейка зуба
root of a tooth – корень зуба
to brush / clean one's teeth – чистить зубы
to cap a tooth – надевать на зуб коронку
to drill a tooth – сверлить зуб
to extract (pull) a tooth out – удалять, вытаскивать зуб
to fill a tooth – пломбировать зуб
to pick one's teeth – ковырять в зубах
to set (clench, grind, grit) one's teeth – стиснуть зубы
He cut a tooth. – У него прорезался зуб. I had my tooth out. – Мне удалили зуб.
teeth ache – зубы болят teeth chatter – зубы стучат
teeth decay (rot) – зубы гниют teeth erupt – зубы прорезываются
teeth fall out – зубы выпадают
artificial (false) tooth – искусственный, вставной зуб

baby (m ilk) tooth – молочный зуб	decayed tooth – кариозный зуб	back tooth – задний зуб
permanent tooth – коренной зуб	wisdom tooth – зуб мудрости	front tooth – передний зуб
loose tooth – шатающийся зуб	upper tooth – верхний зуб	lower tooth – нижний зуб

to fed to the teeth – сыт по горло; надоело, осточертело
in the teeth of smth. – наперекор, вопреки (чему-л.)
to cast smth. in smb.'s teeth – бросать кому-л. в лицо упрёк
to cut one's teeth on smth. – приобретать первый опыт в чём-л.
to get one's teeth into smth. – горячо взяться за что-л.
tooth and nail – правдами и неправдами, всеми возможными способами
armed to the teeth – вооружённый до зубов
to be fed to the teeth – осточертеть, до смерти надоесть; сыт по горло
to cast smth. in smb.'s teeth – упрекать кого-л. в чём-л.
to cut one's teeth in smth. – приобрести (первый) жизненный опыт
to draw its teeth – обезвредить; сделать беззащитным; выхолостить
to get one's teeth into smth. – крепко, горячо взяться за что-л.
if you cannot bite, never show your teeth – "если не можешь кусаться, не показывай зубы"
in the teeth of smth. – вопреки; перед лицом чего-л. to one's teeth – в лицо, в глаза
to put smb.'s teeth on edge – действовать кому-л. на нервы, резать слух
to put teeth in smth. – сделать что-л. действенным, боевым, опасным
scarce as hen's teeth – кот наплакал
to set one's teeth – стиснуть зубы, проявлять выдержку
to show one's teeth – "показывать зубы", угрожать; огрызаться
to tooth and nail – изо всех сил, не на жизнь, а на смерть; до последней капли крови
to be fed up to the (back) teeth – сыт по горло
long in the tooth – старый; песок сыплется
tooth and nail – изо всех сил; ожесточённо; не на жизнь, а на смерть
to fight tooth and nail – ожесточённо сражаться
to get one's teeth into smth. – горячо взяться за что-л.
to cast smth. in smb.'s teeth – бросать кому-л. в лицо упрёк
to cut one's teeth on smth. – делать первые шаги, приобретать первый опыт в чём-л.
armed to the teeth – вооружённый до зубов

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

Exercise 2. Translate at sight the following.

1. "Have you ever been wounded or shell-shocked?"

"No, but I was injured during an automobile accident. Some bad cuts and an internal hemorrhage." "Yes, I noticed those stitches on your forehead. Was it painful (did it hurt)?" "No, they gave me a local anesthetic to deaden the pain. I didn't feel anything." "Any broken bones?" "No, none."

2. Physiotherapy includes electrical, hydropathical, mudbath, sunray and other treatments.

3. In many countries tuberculosis claims the greatest number of victims next to cancer.

4. Special Health Education Centres (дома санитарного просвещения) have been founded in all the larger towns in our country. By means of public lectures and articles in the press, special leaflets and booklets, exhibitions and health drives they are trying to impress upon the public mind the basic principles of health protection.

Exercise 3. Make up a dialogue of your own using the words and phrases.

not to look quite well
a cold in the head and a slight headache
"What's the matter with you, young man?"
"Does it hurt when you swallow?"
to listen to the heart, to sound the lungs
to make out a prescription
"Remember it's catching!"
to put smb. right
not to feel too well
to see a doctor
to run a temperature
to give a thorough examination
to be put on the sick-list
to prescribe a treatment for
three days' treatment

Exercise 4. Answer the questions.

1. When were you ill last? Did you have to keep your bed? How long did you have to keep your bed? 2. Did you call in a doctor when you fell ill? What did you complain of? Did the doctor give you a sick-note? 3. What examination did the doctor give you? What treatment did he prescribe? How long did it take you to get well? 4. What diseases did you have in your childhood? Are you subject to colds now? 5. What do you usually take for a headache? Do you often suffer from headaches? What is the best remedy for a headache? 6. What are the symptoms of pneumonia? What are the symptoms of quinsy? Have you ever been ill with either of them? 7. Is scarlet fever an infectious disease? May the patient stay at home if he has scarlet fever? What other infectious diseases do you know? 8. What do we do with the doctor's prescription? How often did you take the medicine when you were ill? Did you follow the doctor's advice? 9. Have you ever had a complication after a disease? When was it? Are you still suffering from it?

Exercise 5. Compose your own dialogues.

1. A doctor is talking to a patient. He is trying to find out what is wrong. The patient is describing some of the symptoms. 2. Someone in your family is very ill. Ring the doctor for advice. Describe the patient's symptoms. 3. Two patients are waiting for the doctor to receive them. hey are talking about what is troubling them.

You may use the following for a) the doctor, b) the patient.

a) What can I do for you? What are you complaining of? What troubles you? Where exactly is the pain? When do you get it? How long have you had this pain? When you get the pain, how long does it last? Do you have any other symptoms? I'm afraid you've got... . Here is a prescription for ... .

Take two tablets night and morning until you feel better. The pain will go away. This is nothing to worry about. b) Symptoms: I feel hot (cold, sick, feverish). It hurts in my chest (ear). I've got stomachache (toothache, earache). I've got a sore throat (eye).I've got a high temperature (a fast pulse, a high blood pressure, a bad cough). The pain is mild (quite bad, severe). What medicine is this? Can I get it without a prescription? How do I take this medicine? How often should I take it? How much should I take it? can I stop taking it as soon as I feel better?

Exercise 6. Fill in the missing parts of the dialogues and reproduce them.

A.: You don't look very well this morning. What's the matter? Didn't you sleep well?
B.: (He did not sleep very well and he is feeling poorly.)
A.: You haven't got any pain, have you?
B.: (He has no pain.)
A.: Got a temperature?
B.: (He doesn't think he has any; he thinks that he is quite all right, only just a bit tired, that's all.)
A.: Don't you want to see a doctor?
B.: (He thanks A. but he doesn't want to see a doctor as he is sure he will be perfectly fit again before long.)

Doctor: Well, what are you complaining of?
Patient: (She hasn't been feeling well. She has pains just below where her heart is.)
D.: Do you have these pains all the time?
P.: (She doesn't have them all the time. The pains usually come after meals.)
D.: After meals? Do you eat very big meals?
P.: (She is fond of her food.)
D.: That's probably the reason why you have these pains. Lighter meals, that'll probably put you right.
P.: (She thanks the doctor and promises to follow his advice.)

Exercise 7. Read and retell the jokes.

1. "Pardon me for a moment, please", said the dentist to the patient, "But before beginning this work I must have my drill".

"Good heavens!" exclaimed the patient irritably, "can't you pull out a tooth without a rehearsal?"

2. Professor: You've answered all the questions correctly so far. Here is one easier question. What's the dosage to be used in the case you have just described? The drug you suggested was the best you could think of. What I want to know now is the dosage.

Student (in a strong voice): A tablespoonful. Professor (whose face turns red): Oh...Thank you, you may go. (The student is near the door when he suddenly realizes what mistake he has made). Student: I'm sorry, sir, the dosage is six drops only. Professor: Too late – the man you attended to is dead.

3. Once an old gentleman went to see a doctor. The doctor examined him and said: "Medicine won't help you. You must have a complete rest. Go to a quiet country place for a month, go to bed early, drink milk, walk a lot, and smoke just one cigar a day." "Thank you very much," said the old gentleman, "I shall do everything you say."A month later the gentleman came to the doctor again.

"I'm very glad to see you," said the doctor. "You look much younger."

"Oh, doctor, " said the gentleman, "I feel quite well now. I had a good rest. I went to bed early. I drank a lot of milk. I walked a lot. Your advice certainly helped me. But you told me to smoke one cigar a day, and that one cigar a day almost killed me at first. It's no joke to start smoking at my age."

4. A woman called one day at a house where there were three children, a boy and two girls. The boy had a cold and one of the girls had measles, and everyone was giving them presents. The other girl sat alone, crying bitterly. The woman went over to her and asked, "Why are you crying so bitterly?"

"They have all got measles, and colds, and everybody is buying them presents, and I haven't got anything," said the girl and cried again.

Exercise 8. Digest the score of the information briefly in English.

Exercise 9. Render the main idea of the information.

TOPICAL VOCABULARY

heart – сердце (орган тела); душа, сердце

healthy (strong) heart – здоровое, сильное сердце
weak heart – слабое сердце
artificial heart – искусственное сердце
to transplant a heart – пересаживать сердце
heart fails / stops – сердце останавливается
heart palpitates (throbs, beats) – сердце бьётся
heart pumps blood – сердце перекачивает кровь
athletic heart – гипертрофия сердца без болезней клапанов
left heart – левая половина сердца
right (venous, respiratory) heart – правая половина сердца
pulmonary heart – правые отделы сердца; легочное сердце
lymph heart – лимфатическое сердце
cold (cruel, hard) heart – холодное, жестокое сердце
good (kind, soft, tender, warm) heart – доброе сердце
my heart aches (bleeds) (for her) – у меня сердце болит (за неё)
In my heart I know that she is right. – В душе я знаю, что она права.
to gladden smb's heart – радовать кого-л., доставлять радость кому-л.
to harden smb.'s heart – ожесточать чьё-л. сердце
to lay (take) to heart – принимать близко к сердцу
to speak from the heart – говорить от всего сердца, искренне
at heart (in one's heart) – в глубине души
big heart – благородство, великодушие
from the bottom of one's heart – из глубины души
man of heart – отзывчивый человек
stout heart – смелый человек; преданное сердце
to give heart – ободрять to take heart – мужаться
to lose heart – падать духом; впадать в уныние; отчаиваться
to pluck up heart – собраться с духом, набраться храбрости
to set one's heart – решиться (сделать что-л.)
brave heart – храброе сердце, смельчак, храбрец, бесстрашный человек
faint heart – "трусливое сердце", трус
to break smb's heart – разбить чьё-л. сердце
to give one's heart to smb. – полюбить кого-л.
to have a heart for – любить (что-л.)
to steal (win) smb.'s heart – завоевать чьё-л. сердце
after one's own heart – по сердцу
the heart of the matter – суть дела at the heart of smth. – в основе чего-л.
to get to the heart of smth. – схватывать суть
by heart – наизусть, на память
to wear one's heart on one's sleeve – не (уметь) скрывать своих чувств
from the bottom of one's heart – искренне
Have a heart! – Сжальтесь! Помилосердствуйте!
he's a man after my own heart – он мне очень по душе
the way to smb.'s heart – путь к чьему-л. сердцу
to do smb.'s heart good – осчастливить кого-л.
to have one's heart in one's boots – испытывать чувство безнадёжности

to have one's heart in one's mouth (throat) – душа в пятки ушла
to have one's heart in the right place – иметь хорошие, добрые намерения
to have smth. at heart – быть преданным чему-л., глубоко заинтересованным в чём-л.
to set one's heart on smth. – страстно желать; стремиться к чему-л.
to eat one's heart out – кусать локти, смириться с незавидной участью, молча переносить страдания
to take heart of grace – собраться с духом
heart and hand – с энтузиазмом, с энергией
bleeding heart – человек, проявляющий излишнее сочувствие к другим
out of heart – в унынии, в плохом состоянии
with a single heart — единодушно with half a heart – неохотно
with half a heart – без интереса, неохотно, без энтузиазма
half-heartedly – нерешительно; равнодушно, без энтузиазма; со смешанными чувствами
half-hearted – нерешительный, неуверенный; равнодушный, незаинтересованный
After a half-hearted search, they go home. – После вялых поисков, они отправляются домой.

foot – ступня arch of foot – свод стопы
in one's stocking feet – в чулках, без туфель
to gain (get) to one's feet – встать на ноги
to shuffle one's feet – шаркать ногами
to stamp (tap) one's foot – наступать на ногу
The dog lay at her feet. – Собака лежала у неё в ногах. They came on foot. – Они пришли пешком.
to be on one's feet – 1) быть на ногах, оправиться после болезни
прочно стоять на ногах, быть самостоятельным, материально обеспеченным
to set foot on – ступать ногой на
flat feet – плоскостопие heavy foot – тяжёлая поступь
on foot – пешком; в движении; в стадии приготовления
I was not aware of your presence. Your foot is so light. – Я не заметил, как вы вошли. У вас такая лёгкая походка.
to carry smb. off his feet – вызвать чей-л. восторг; сильно взволновать,
to catch smb. on the wrong foot – застать кого-л. врасплох
to put one's best foot forward – пытаться произвести хорошее впечатление
to put one's feet up – бездельничать
to put one's foot down – занять твёрдую позицию
My foot! – (Какая) чепуха!; Как бы не так! Ври(те) больше! Так я и поверил! Вот ещё выдумал(и)! Недурно придумано! чёрта с два, чёрта лысого
to be on foot – проектироваться
to drag one's feet – едва волочить ноги
to get a foot in the door – сделать первый шаг, начать
to know (get, find, have, take) the length of smb.'s foot – узнать чью-л. слабость, раскусить человека
to set (put, have) one's foot on the neck of smb. – поработить кого-л.
under foot – на земле, под ногами
to land on one's feet – удачно выйти из трудного положения
She always lands on her feet. – Ей всегда удаётся выйти сухой из воды.
to put one's foot in(to) it – сплоховать; попасть впросак
to put one's best foot forward – пытаться произвести хорошее впечатление
to get one's feet wet – начать (что-л.), приступить (к чему-л.)
with both feet – полностью, целиком; решительно, твёрдо
to be beneath smb.'s foot – находиться в полном подчинении у кого-л
to be dead on one's feet – быть смертельно усталым, едва держаться на ногах

better the foot slip than the tongue – лучше оступиться, чем оговориться; слово не воробей, вылетит – не поймаешь

to bring smb. to his feet – заставить кого-л. встать (для ответа и т. п.)

That remark brought him to his feet at once. – Это замечание заставило его встать и высказаться.

to carry smb. off his feet – вызвать энтузиазм, ошеломить кого-л.

to catch smb. on the wrong foot – застать кого-л. врасплох

cold feet – трусость, малодушие

What's the matter with you? Cold feet? – Что с тобой? Ты трусишь?

cold feet come on the hot foot – быстро прийти; тут как тут

You dress an' grab a cab, see? Come down here on the hot foot. – Одевайся и беги за такси, понятно? Одна нога там, другая здесь.

crow's feet – гусиные лапки, морщинки (у уголков глаз)

Notable crow's feet had come about the corners of her nose, mouth and eyes. – На ее лице появились морщинки у глаз, рта и вокруг носа.

to die on one's feet – рухнуть, потерпеть крах

The scheme died on its feet. – Затея сорвалась.

to fall on one's feet – выкрутиться из затруднительного положения, выйти сухим из воды

feet first (foremost) ((with one's) – ногами вперёд, в гробу

feet of clay – "глиняные ноги", т. е. слабость того, кто казался великим

to find one's feet – найти место в жизни; призвание; стать на ноги

to get (a one's) foot in) – начинать, пытаться освоить что-л.; пробиться

to get off (start, step) on the right foot – удачно начать

to get the foot of smb. – опередить, обогнать кого-л.

with one foot in the grave – одной ногой в могиле

to vote with one's feet – "проголосовать ногами", выразить своё недовольство уходом

to trample under foot – 1) топтать кого-л. 2) подавлять кого-л.

to throw one's feet – попрошайничать, нищенствовать

to think on one's feet – быстро соображать, реагировать

to stagger (struggle) to one's feet – с трудом подняться, стать на ноги

to sit at smb.'s feet – преклоняться перед кем-л.

to set foot – ступить ногой, ступить на землю; появиться, пойти

to rush smb. off his feet – завалить кого-л. работой; поторапливать

to put (set) smth. on foot) – пускать что-л. в ход, начать осуществлять, положить начало чему-л., проводить в жизнь что-л.; снаряжать

to put one's foot into one's mouth – влипнуть, попасть впросак, сесть в лужу, в калошу

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

Exercise 2. Translate the proverbs.

1. Early to bed and early to rise makes a man healthy, wealthy & wise. 2. Good health is above wealth. 3. Health is not valued till sickness comes. 4. An apple a day keeps the doctor away. 5. Who has a toothache, should keep/hold his tongue on it. 6. He whets his teeth on something. 7. He shows the whiteness of his teeth. 8. Prevention is better than cure. 9. Eat to live, not live to eat. 10. Never let the sun go down on your anger. 11. A stitch in time saves nine. 12. You are what you eat. 13. A smile is an inexpensive way to improve your looks. 14. The less you eat, the longer you live.

Exercise 3. Explain the phrase.

a no-brainer

Something that requires little mental effort or intelligence to perform or understand. The term is often applied to decisions which are straightorward or sometimes to people who appear to lack intelligence.

Exercise 4. Translate the sentences with key word «teeth, heart, foot» into Russian.

1. I'm fed to the **teeth** with routine. 2. Have a **heart** and lend me some money. 3. I didn't have the **heart** to tell her. 4. I thank you from the bottom of my **heart.** 5. I just call to say I love you and I mean it from the bottom of my **heart**. 6. I was speaking from the bottom of my **heart**. 7. He's not bad at **heart**. 8. The Duke of Edinburgh, renowned for his insensitive remarks to members of the public, has put his **foot** in it again. 9. "It's not hard to dance once you get your **feet** wet", said the teacher. 10. I've been sitting in one position so long that my **foot** has gone to sleep. 11. Jimmy never leaves a job unfinished. He continues to work even when he's dead on his **feet**. 12. You sort of expect a candy-ass like me to have cold **feet**. 13. I had got into the habit of throwing my **feet** in the morning, and of spending the afternoon in the little park. 14. Vera staggered to her feet. She said: "I feel awful. I must go to bed." 15. He put his **foot** in it again. 16. Every time she opens her mouth she puts her **foot** in it. 17. I just said what came into my head putting my **foot** in it as usual. 18. The teacher must be able to think on his **feet.** 18. He can't think on his **feet** too well. 19. He put his **foot** down and didn't let her go out on a date. 20. She has put her best **foot** forward.

Exercise 5. Translate the sentences with key word «chest, jam, eye, throat» into Russian.

1. He felt sharp **chest** pains and went to see the doctor. 2. He is always complaining about the difficulty and hardship of his lot, but compared with most of us he's got **jam** on it. 3. They seem to be gaining the **ear** of the government. 4. In at one **ear** and out at the other. 5. It is as much as your **ears** are worth to venture into that part of New York at night. 6. The boys chatted gaily while they dressed. Philip was **all ears**. 7. The bone has stuck in my **throat**. 8. In the last year she had been subject to **throats** and coughs. 9. What do you mean by jumping down her **throat** every time she opens her face? 10. Don't jump down my **throat**! 11. He jumped down my **throat**.

Exercise 6. Translate the sentences with key word «nail, hand, arm» into Russian.

1. He must have iron **nails** which scratch a bear. 2. You have sent me a challenge, and the hangman shall bring you my answer. My peroration was never extempore, but always prepared beforehand, and polished to the **nail**. 3. She took me by the **arm** and hurried me out of the room. 4. He chanced his **arm** and went to see her. 5. Do make a long **arm** and get me down a box of chocolates. 6. They'll wind up putting drinks on the **arm**. 7. "Nick", said he, "never put out your **arm** further than you can draw it easily back again." 8. No one could convince her that all that was under the **arm.** 9. In scientific debate the unprepared speaker may find that he is fighting with one **arm** tied behind his back. 10. These good people received him with open **arms**, and were quite ready to talk. 11. All our suggestions were dismissed out of **hand**. 12. Knowing that he had fallen into good **hands** in his new home the little boy went to sleep as soon as his head touched the pillow.13. He grasped the hot metal with his bare **hands**. 14. The land round his house was in his own **hands**. 15. The documents fell into enemy hands. 16. The condemned man's fate is in the governor's hands. 17. Give me a hand with the dishes. 19. Give me a hand with this ladder. 18. He would not lift a hand to help. 20. She had brought me up "by hand".

Exercise 7. Summarize your findings on phrasal words in a short presentation (75 words).

Exercise 8. Translate the sentences with idioms of body parts.

foot in mouth

You say or do something that accidentally embarrasses or offends another person.
'I put my foot in my mouth when I called by brother's new wife by his ex-wife's name.'

cost an arm and a leg

When something costs an arm and a leg it costs a lot of money. It's very expensive.'
'It cost me an arm and a leg to get my car fixed.'

get off my back

We use this expression when someone is criticising you or telling what to do all the time.
'Stop telling me what to do. Get off my back!'

cold shoulder

To give someone the cold shoulder means to ignore someone.
'I saw my ex-girlfriend at a party but she wouldn't talk to me. She gave me the cold shoulder.'

cold feet

To get nervous and to have second thoughts about doing something.
'I'm getting cold feet about my wedding. I'm so nervous.'

a sight for sore eyes

We use this expression when we are very happy to see someone or something.
'Hi Frank. You're a sight for sore eyes. I haven't seen you for years.'

a finger in every pie

To have a finger in every pie means that you are involved in many activities.

off the top of my head

Off the top of my head means that you say something without really thinking about it. A spontaneous reaction. 'Off the top of my head, I'd say there were a thousand people there.'

look down your nose

When you look down your nose at someone you think you are better or more important than them. 'Because he's rich he seems to think that he's better than everyone. He really looks down his nose at people.'

play it by ear

To play it by ears means to improvise or do something without preparation.
I don't know where we should go tonight. Let's just play it by ear.'

a chip on your shoulder

It is a perceived grievance or sense of inferiority.

foot in the door

An introduction or way in to something, made in order that progress may be made later.

A man after my own heart

A kindred spirit – someone I can agree with.

Exercise 9. Complete the sentences.

1. The businessman seemed to have a finger in every____. 2.They charge an arm and a _____at that restaurant. 3. Good to see you, Jane. You are____for sore throat. She has cold ____ about her trip, but she will be OK. 4. Be careful what you say. Try not to put your____in your mouth. 5. She is always complaining about me. She will not get off my ___. 6. H eacts susperior, looking down his ____ everyone.

CONSULTING A DOCTOR

Doctor: Well, what's the matter with you, Mr.Walker?

Patient: You'd better ask me what is not matter with me, doctor. I seem to be suffering from all the illnesses imaginable: insomnia, headache, backache, indigestion, constipation and pains in the stomach. To make things still worse, I've caught a cold, I've got a sore throat, and I'm constantly sneezing and coughing. To crown it all, I had an accident the other day, hurt my right shoulder, leg and knee, and nearly broke my neck. If take a long walk, I get short of breath. In fact, I feel more dead than alive.

Doctor: I'm sorry to hear that. Anyhow, I hope things aren't as bad as you imagine. Let me examine you. Your heart, chest and lungs seem to be all right. Now open your mouth and show me you tongue. Now breathe in deeply through the nose...

There doesn't seem to be anything radically wrong with you, but it's quite clear that you're run down, and if you don't take care of yourself, you may have a nervous breakdown and have to go to hospital. I advise you, first of all, to stop worrying.

Take a long rest, have regular meals, keep to a diet of salads and fruit, and very little meat. Keep off alcohol. If possible, give up smoking, at least for a time. Have this tonic made up and take two tablespoonfuls three times a day before meals. If you do this, I can promise you full recovery within two or three months.

Patient: And if I don't, doctor?

Doctor: Then you'd better make your will, if you haven't yet done so!

Patient: I see. Well, thank you, doctor. I shall have to think it over and decide which is the lesser evil - to follow your advice or prepare for a better world!

Exercise 1. Learn the dialogue by heart and carry it on with your classmate in class. Render the contents of the dialogue in Indirect Speech in English.

Exercise 2. Learn the dialogue "Seeing the doctor" by heart and carry them on in class.

Mary Healy fell of her bicycle. She's in the emergency room at the local hospital.

Dr.Singh is examining her.

Doctor: Well, hello, young lady. It looks like you've *had quite a fall*. What were you doing? Going too fast?

Mary: Yes, doctor. I *fell off* going around a corner.

Doctor: I see. well, let me take a look at you. hmm. That's *a bad cut*. I'll have to put a couple of stitches in that.

Mary: I have a cut here too, doctor.

Doctor: It looks worse than it is. Only *the skin is broken*. The nurse will clean it up for you. It'll sting, but that's all. Now does it *hurt anywhere else*?

Mary: I have a pain in my arm. It's very sore, and it *feels stiff.*

Doctor: Well, there's nothing broken, but you've bruised your shoulder. It'll be sore for a few days. Did you bump your head?

Mary: Yes, I did. I fell on the bike. But it doesn't hurt now.

Doctor: Did you *feel dizzy*?

Mary: No, not at all.

Doctor: Look up there. I'm going *to shine this light in your eye*. Uh huh. All right. that's fine. I'll sew this *cut up*, and the nurse will *put a bandage on* it. Then you can go home.

Exercise 3. Learn the dialogue by heart and carry it on with your classmate in class. Render the contents of the dialogue in Indirect Speech in English. Translate the dialogue paying attention to italic phrases.

DIALOGUES «HARRY IS ILL»

HARRY: Nora! Nora!

NORA: (*coming into the room*) Yes, what is it now, Harry?

HARRY: Oh, there you are. Look here, Nora, I'm tired of lying here on my back with nothing to do. I *hate doing nothing*.

NORA: Don't be silly, Harry. You've got a temperature, and staying in bed is the only sensible thing to do. Now just be quiet, and stop preventing me from doing my housework.

HARRY: No, seriously, Nora. I can't bear it. Lying flat on my back!

NORA: Well then, try lying on your stomach for a change!

HARRY: Stop being funny. I'm going to get up. There! Look, I'm standing up. I'm quite all right. What's the use of *staying in bed*?

NORA: I think you're being very *silly*. You'll only make your temperature go up again.

HARRY: It's no use talking, Nora – being ill doesn't suit me.

NORA: No - and trying to nurse you doesn't suit me!

HARRY: Now don't be bitter about it. You know I'm *grateful to* you for looking after me. But you mustn't try *to keep me in bed* like *a naughty boy*.

NORA: Well, you began it, by behaving like a naughty boy!

HARRY: I'm all against this staying in bed for no reason.

NORA: Harry, being ill is a reason... Now don't stand by that window and catch another cold... Let me see, half past eleven.

HARRY: Why do you *keep looking at* the clock?

NORA: I'm expecting Mother – she's *coming ove*r for the day.

HARRY: Good heavens, I didn't know that.

NORA: Yes, I think she has something she wants to talk to you about.

HARRY: Oh heavens! Has she? (groans) Oh... You know, Nora, I
do feel a bit ill; perhaps I'd better get back to bed.

NORA: (*disingenuously*) Oh, what a pity! I thought perhaps you might stay up to see her.

HARRY: (to himself) *That's the very reason* I'm getting back into bed!

NORA: What did you say?

HARRY: Oh, er-nothing.

Exercise 1. Learn the dialogue by heart and carry it on with your classmate in class. Render the contents of the dialogue in Indirect Speech in English.

TOPICAL VOCABULARY

toe – палец ноги big toe – большой палец (ноги) little toe – мизинец (ноги)

to curl one's toes – поджимать пальцы на ногах
to stub one's toe on smth. – потерпеть неудачу
toe post shoe – вьетнамка
to turn one's toes out / in – ставить ноги носками наружу / внутрь
a toe in the door – удачная для старта позиция
from top to toe – с головы до пят; сверху донизу
to turn up one's toes – протянуть ноги, умереть
toe to toe – лицом к лицу; один на один
to be on one's toes – 1) быть жизнерадостным 2) деятельным 3) решительным
toe the line (mark, scratch) – строго придерживаться правил
on one's toes – деятельный, энергичный, активный; в напряжении
to step (tread) on smb.'s toes – задеть чьи-л. чувства; наступить на чью-л. мозоль
to turn up one's toes – протянуть ноги, отдать Богу душу, умереть

leg – a) нога (от бедра до ступни)

to bend one's legs – согнуть ноги
to cross one's legs – скрестить ноги, положить ногу на ногу
to lift (raise) one's legs – поднять ноги
to lower one's legs – опустить ноги
to spread one's legs – вытянуть ноги
to straighten one's legs – выпрямить ноги
to stretch one's legs – вытянуть ноги gammy
leg – хромая нога artificial (wooden) leg – протез, деревянная нога
to make a leg – расшаркиваться
to keep one's legs – прочно держаться на ногах; устоять
to pull smb.'s leg – морочить голову кому-л.; дурачить
to run off one's leg – сбиться с ног
to walk smb. off his legs – сильно утомить кого-л. ходьбой, прогулкой
to get a leg in – втереться в доверие
to have by the leg – поставить в затруднительное положение
to have the legs of smb. – бежать быстрее кого-л.; убежать от кого-л.
to stand on one's own legs – быть независимым
to stretch one's legs according to the coverlet – по одёжке протягивай ножки.
to take to one's legs – удрать, улизнуть
to give smb. a leg up – помочь кому-л. преодолеть трудности
to have not a leg to stand on – не иметь оправдания, извинения
to put (set) smb. on his legs – поставить на ноги (после болезни); помочь материально
all legs (all legs (and wings)) – неловкий, неуклюжий высокий подросток
as fast as one's legs can carry one – со всех ног, сломя голову, что есть духу
to be (run) off one's legs – сбиться с ног, быть без ног (от усталости)

finger – палец (на руке)

to point a finger at smth. – указывать пальцем на что-л.
to snap one's fingers – щёлкать пальцами; командовать
to prick a finger – уколоть палец
She jammed her finger in the door. – Она прищемила палец дверью.
index finger – указательный палец
little finger – мизинец (на руке) *Syn. minimus, pinkie*

middle finger – средний палецring finger безымянный палец
trigger finger – указательный палец
not to move (stir, lift) a finger – палец о палец не ударить
to count on one's fingers – считать на пальцах
to give smb. the finger – выразить презрение
to have a finger in the pie – вмешиваться во что-л.
to have smb. wrapped around one's little finger – полностью подчинять себе кого-л.
to keep (cross) one's fingers crossed – складывать, держать пальцы крест-накрест (чтобы не сглазить, в знак пожелания удачи)
to lay (put) one's finger on smth. – точно указать что-л.; попасть в точку; правильно понять
to turn (twist) smb. round one's (little) finger – вить верёвки из кого-л.
better a finger off than aye wagging – "лучше отрубить большой палец, чем с ним мучиться"
to burn one's fingers – обжечься на чём-л
butter fingers – человек, у которого всё из рук валится; руки-крюки
can be counted on the fingers of one hand – можно пересчитать по пальцам одной руки
to crook one's finger – шевельнуть пальцем, поманить кого-л.
to have (one's) finger in the pie – участие в каком-л. деле
the finger of Fate – перст судьбы, перст Божий
to get (get (pull, take) one's finger out) – браться за дело
to have (keep) one's finger on the pulse – "тщательно следить за пульсом", т. е. внимательно следить за чем-л., быть в курсе дела
to let smb. slip through one's fingers – проворонить кого-л.
the medical finger – безымянный палец [по старинному поверью, через безымянный палец проходит нерв, соединяющий его с сердцем, поэтому человек, растирая лекарство этим пальцем, мог сразу почувствовать, вредное оно для здоровья или нет]
not to be worth smb.'s little finger – не стоить чьего-л. мизинца, быть недостойным кого-л.
one's fingers are all thumbs – неловкий, неуклюжий человек, растяпа; у него (у неё и т. д.) всё из рук валится, у него (у неё) руки-крюки;
one's little finger is thicker than another's loins – ничто в сравнении
to point the finger of scorn at smb. – насмехаться над кем-л.
to put one's finger in the fire – напрашиваться на неприятности, лезть на рожон
to snap one's fingers at smb. – открыто выражать презрение к кому-л. (чему-л.), не считаться с кем-л. (или с чем-л.); в грош не ставить
to one's finger's ends (finger-tips) – до кончиков ногтей; до мозга костей
to turn (turn (twist, wrap, wind) smb. round one's finger – помыкать кем-л.; верёвки вить из кого-л., заставить кого-л. плясать под свою дудку
with a wet finger – с лёгкостью, без труда, запросто

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

Exercise 2. Answer the questions.

1. What measures are usually taken to check the spread of an epidemic of the grippe? 2. What must one do to keep in good health? 3. Are visitors allowed at hospitals at any time or are there special fixed hours to visit in-patients (those laid up there)? 4. At some hospitals they check the parcels visitors bring to patients. Now why do they do so? 5. Are operations on a live heart in the experimental stage as yet or are they a common practice among highly skilled surgeons? 6. How should we translate "a sick man" into Russian? 7. During operations anesthetics are used to deaden the pain, aren't they? 8. Local anesthetic seems to be a must nowadays when a tooth is being extracted, doesn't it? 9. What explains the high morality rate among colonial people? 10. What diseases are known as "social diseases" and why?

DIALOGUE «AT THE DOCTOR'S OFFICE»

- (*Doctor, regarding his patient*) You don't look very cheerful today, Mr. Liss.
- I don't feel very well, Doctor.
- What seems to be the trouble?
- Well, for one thing I haven't been sleeping so well. I feel a little tired. I have some pain occasionally.
- You mean that you have insomnia. You know the best cure for insomnia, don't you? A good night's sleep. Have you tried drinking a little warm milk and eating a few crackers before going to bed?
- Six months ago you told me not to eat anything before I went to bed.
- (*Smiling*) That just goes to show you what great progress medical science has made recently.
- Anyway, it's more the pain in my leg that I have come to see you about. I haven't slept well for years, so I am used to that. But this pain has been bothering me a good deal lately. It's not a steady pain. It comes and goes. It is in my right leg. Do you think it might be a little rheumatism?
- It might be rheumatism, neuritis, arthritis, poor circulation, kidney trouble, and heart trouble – any number of things. It is hard to say what it is without first giving you a series of tests. How do you feel in general? You say that you are tired. How is your appetite? Do you eat well?
- Very well.
- You seem a little overweight. Maybe you eat too much & exercise too little. Could that be the case?
- Naturally, I'm not as active physically as I used to be. I'm at my office all day long. I have my own business, and I work pretty hard at it.
- I suspect maybe you work too hard at it. Take off your coat and roll up your sleeve, please. I want to check your blood pressure. How old are you, Mr. Liss – about 50? I'm 52.
- (*Doctor, testing blood pressure*) Your blood pressure is slightly above normal - but nothing to worry about. Have you ever had any trouble with your heart – any shortness of breath? Any dizziness after climbing stairs?
- No, I've never had any trouble of that sort.
- How long have you had these pains in your leg? You say the pain comes and goes. Would you say that you feel it more in the joints or in the muscular part of your leg?
- I believe it is more in the joints. I've had it now for about three months. At first felt it more in my knee; then later it moved down into my ankle.
- Do your knees or ankles swell?
- I believe they swelled a little. I didn't notice particularly. I know they were sore to the touch. Generally, it is a steady ache that I feel, but sometimes it is more like a series of sharp pains.
- It sounds to me like the beginning of a little arthritis. I don't think it is anything serious, but you naturally have to be careful. You should avoid getting chilled. Don't get your feet wet, and stay out of drafts. You should also try to get a little more rest and to build yourself up in general. I'll give you some tablets that will help you. However, I want you to be sure to get in touch with me every two or three days to let me know whether you feel any particular reaction. The pills are something new and rather potent. You take only one a day.
- Shall I come to your office or can I just telephone you?
- You can telephone me. However, I'm giving you only enough pills to last you three weeks. Then you'd better come in again to see me. If there has been no improvement, I will give you some further tests. In the meantime, try to take it easy. Don't work so hard. In the matter of sleeping you can do a great deal to help yourself. Try going to bed every night an hour earlier than usual. Do something relaxing each evening in order to take your mind off your business & personal problems.
- I'm glad you think it's nothing serious.
- These things are not serious if you catch them in time. But you must also learn to take care of yourself. You are a man of fifty-two years of age. You can't work as hard as you used to do. Take it easy. Otherwise one day you may find yourself in a wheel chair all crippled up with arthritis.

That's not a very happy prospect – is it?

Exercise 1. Analyze the dialogue, learn it by heart and make up sentences with it.

Exercise 2. Answer the questions.

1. What is insomnia? 2. What does the doctor say is the best cure for insomnia? 3. What does the doctor recommend that Mr.Liss do in order to help him sleep better? 4. Has Mr.Liss been suffering from a pain in his back or a pain in his leg? 5. Does Mr.Liss say that it is a steady pain, or a pain that comes and goes? 6. What, in medical terminology, is meant by "poor circulation"? 7. What is the opposite of "overweight"? 8. Does the doctor feel that Mr.Liss' blood pressure is above normal or below normal? 9. In periods of stress or excitement does the blood pressure usually rise or fall? 10. What is normal body temperature? 11. During serious illness or attacts of fever, to what heights will body temperature sometimes go? 12. What treatment does the doctor recommend to Mr.Liss?

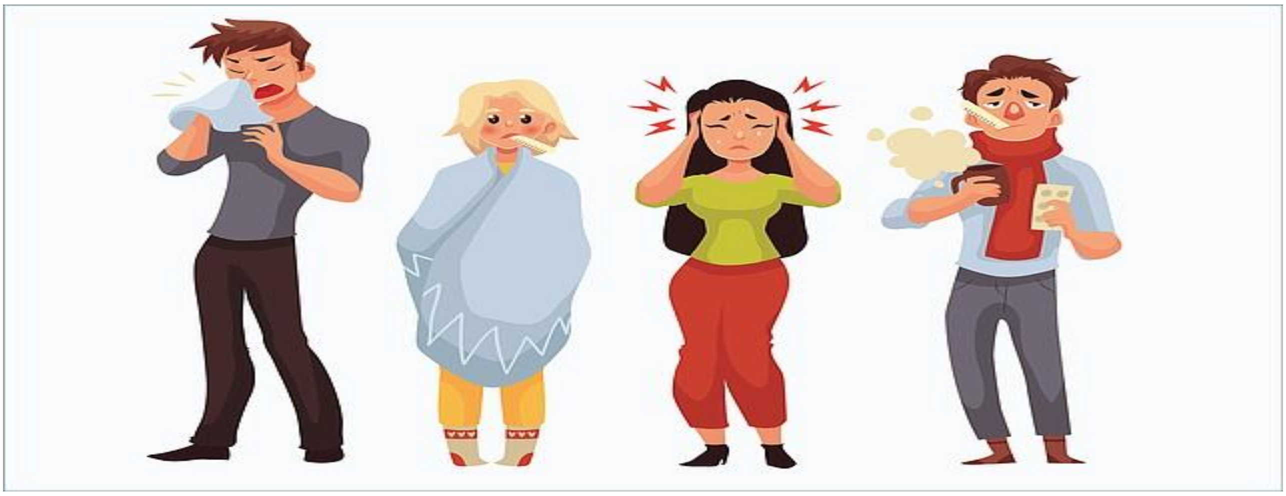
Exercise 3. Find English equivalents for Russian phrases.

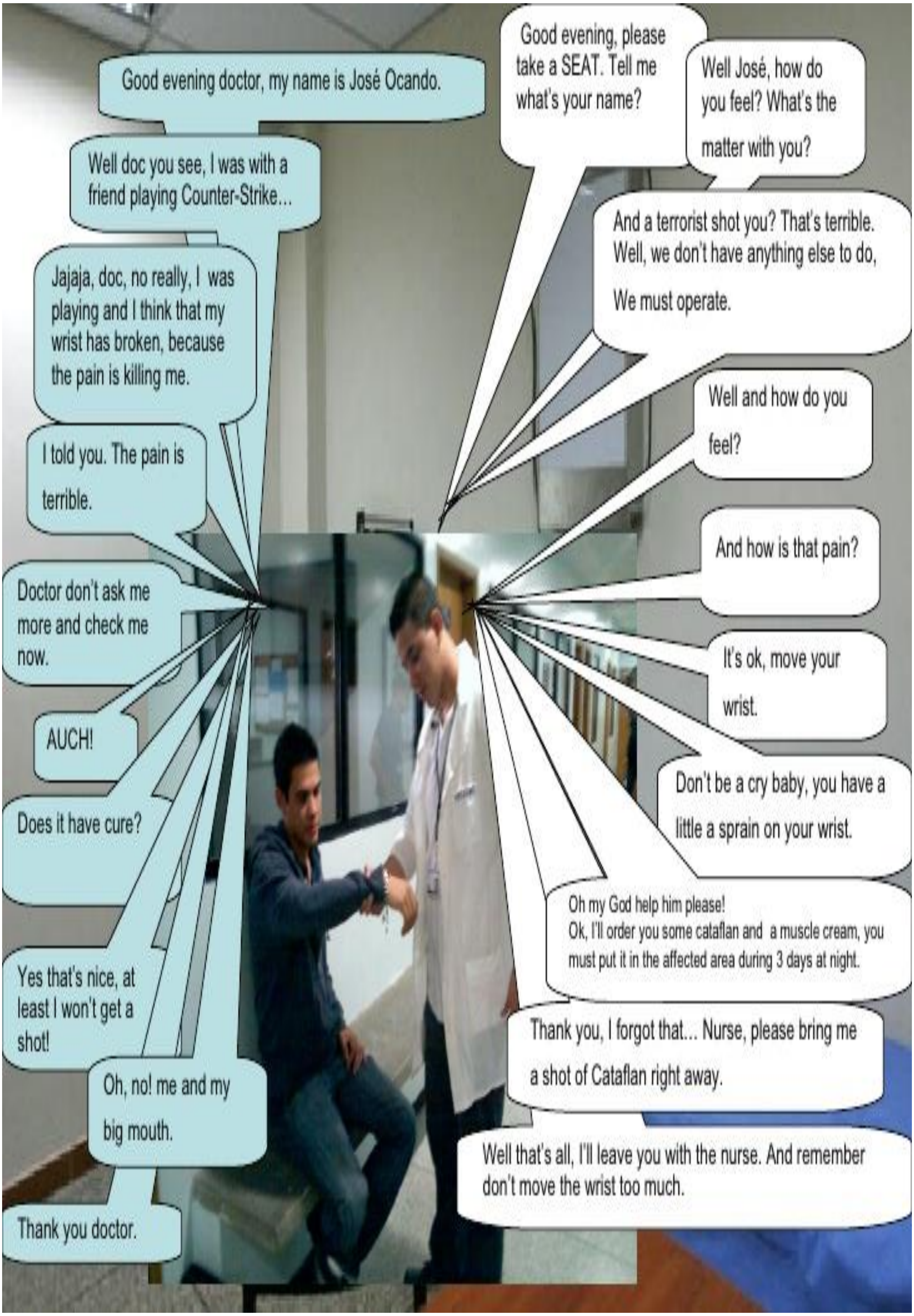
Врач-консультант; упражнения на координацию движений; боль в затылке; поставить ноги вместе; прыгать назад; с закрытыми глазами; приоткрыл дверь в ванную комнату; указательный палец; вынул палец из (дверной) щели; изумительный персто-носовой фокус; обманывать относительно симптомов; выслушал сердце; продолжал испытание; деятельность мозга; ни разу не спутал палец с заливом; двоюродный дед; постоянный врач; сел на край ванны; придерживаться диеты; не менее важно; быть очень полезным; ушел (распрощался); крошечная бутылочка; шпагат, бечевка; продел бечевку; вера в амулеты.

Exercise 4. Translate the sentences with the key word «leg» into Russian.

1. We're finally on the last **leg** of our journey. 2. He is one that cannot make a good **leg**. 3. To stretch one's **legs** according to the coverlet. 4. Don't pull my leg! 5. Leg it, the police are coming! 6. He was now to be seen legging it across the field. 7. A little boy was legging the boat along. 8. A little boy was legging the boat along. 9. I'm sorry that I'm late - I missed the bus and I had to leg it. 10. We had to leg it back. 11. For the first time in her life Eily said she was having a holiday. It was marvellous not to be rushing round a restaurant and run off her legs all day. 12. The ballet was on its last legs... 13. Whenever I've got in a really tight fix, something has turned up and put me on my legs again.

Exercise 5. Analyze the information, which is in the highlight, and use it in practice.





Good evening, please take a SEAT. Tell me what's your name?
Good evening doctor, my name is José Ocando.
Well José, how do you feel? What's the matter with you?
Well doc you see, I was with a friend playing Counter-Strike…
And a terrorist shot you? That's terrible. Well, we don't have anything else to do, We must operate.
Jajaja, doc, no really, I was playing and I think that my wrist has broken, because the pain is killing me.
Well and how do you feel?
I told you. The pain is terrible.
And how is that pain?
Doctor don't ask me more and check me now.
It's ok, move your wrist.
AUCH!
Don't be a cry baby, you have a little a sprain on your wrist.
Does it have cure?
Oh my God help him please!
Ok, I'll order you some cataflan and a muscle cream, you must put it in the affected area during 3 days at night.
Yes that's nice, at least I won't get a shot!
Thank you, I forgot that... Nurse, please bring me a shot of Cataflan right away.
Oh, no! me and my big mouth.
Well that's all, I'll leave you with the nurse. And remember don't move the wrist too much.
Thank you doctor.

TOPICAL VOCABULARY

shoulder – плечо; плечевой сустав

broad (square) shoulders – широкие плечи
to work shoulder to shoulder – работать плечом к плечу
to shrug one's shoulders – пожимать плечами
to square one's shoulders – распрямлять плечи
rounding of the shoulders – сутулость
to rub shoulders with – общаться с (кем-л.)
shoulder aside – заставить уступить место (кому-л.)
to cry on smb.'s shoulder – плакаться кому-л. в жилетку
to give (show) smb. the cold shoulder – проявить неприязнь
to have broad (on one's) shoulders – выносить на своих плечах всё
open out one's shoulders – расправить плечи, собраться с силами
to take on one's own shoulders – взять, взвалить на себя ответственность
to look over one's shoulder – оглядываться, бояться, остерегаться
to look over smb.'s shoulder – внимательно наблюдать, следить за кем-л.
one shoulder of mutton draws down another – аппетит приходит во время еды
to put one's shoulder to the wheel – энергично взяться за дело, приналечь
to put (throw) on smb.'s shoulders – взвалить, переложить на чьи-л. плечи
shoulder to shoulder – плечо к плечу, в тесном единении
straight from the shoulder – сплеча, прямо, без обиняков, начистоту
with one's shoulder to the collar – в напряжённом труде

nail – ноготь

to cut (pare, trim) one's nails – стричь ногти
to do (manicure) one's nails – делать маникюр
to file one's nails – подпиливать ногти
to polish one's nails – полировать ногти
to break a nail – сломать ноготь to bite one's nails – кусать ногти
on the nail – на месте, тут же; немедленно
Pay on the nail! – Деньги на бочку!
to pay (down) on the nail – расплачиваться сразу
(as) hard as nails – выносливый, закаленный; жестокий
right as nails – совершенно правильно; совершенно здоровый
to nail down – поймать на слове
to nail smb. down – прижать кого-л. к стене
to nail smb. down to his promise – требовать выполнения обещания
to nail one's colours to the mast – открыто отстаивать свои взгляды
to nail smb. to the wall – прижать кого-л. к стене
to nail to the barndoor – пригвождать к позорному столбу
to nail to the counter – опровергнуть ложь, клевету
to the nail – тщательно, самым тщательным образом; со всей точностью
to drive a nail (hammer, knock, put) in smb.'s coffin – свести кого-л. в могилу; ускорить гибель
he must have iron nails that scratches a bear – тот, кто идёт на опасное дело, должен быть во всеоружии
to hit the nail on the head – попасть в точку, угадать
one nail drives out another – клин клином вышибают

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

AT THE DOCTOR'S

My doctor took me to see a consulting physician. I liked him immensely. He put me through some coordination exercises.

"Have you a pain in the back of your head?" he asked. I told him I had not.

"Shut your eyes", he ordered, "put your feet close together, and jump backward as fast as you can." I always was a good jumper with my eyes shut, so I obeyed. My head struck the edge of the bathroom door, which had been left open and was only three feet away. The doctor was sorry. He had overlooked the fact that the door was open. He closed it. "Now touch your nose with your right forefinger", he said.

"Where is it?" I asked. "On your face", said he.

"I mean my right forefinger", I explained.

"Oh, excuse me", he said. He reopened the bathroom door, and I took my finger out of the crack of it. After I had performed the marvellous digotonasal feat[1] I said: "I do not wish to deceive you as to symptoms, Doctor; I really have something like a pain in the back of my head." He ignored the symptom and examined my heart carefully. "Now", he said, "gallop like a horse for about five minutes around the room." I gave the best imitation I could of a disqualified percheron[2] being led out of Madison Square Garden[3]. Then he listened to my chest again. The physician held up his forefinger within three inches to my nose. "Look at my finger", he commanded.

"Did you ever try Pears[4]?" I began; but he went on with his test rapidly.

"Now look across the bay. At my finger. Across the bay. At my finger. At my finger. Across the bay. Across the bay. At my finger. Across the bay." This for about three minutes. He explained that this was a test of the action of the brain. It seemed easy to me. I never once mistook his finger for the bay.

After asking me if I had a grand-uncle with curvatures of the spine or a cousin with swelled ankles, the two doctors, the casualty physician and the regular doctor, retired to the bathroom and sat on the edge of the bathtub for their consultation. I ate an apple and gazed first at my finger and then across the bay. The doctors came out looking grave. They wrote out a diet list to which I was to be restricted. It had everything that I had ever heard of to eat on it except snails.

"You must follow this diet strictly", said the doctors.

"I'd follow it a mile if I could get one-tenth of what's on it", I answered.

"Of next importance", they went on, "is outdoor air and exercise. And here is a prescription that will be of great benefit to you."

Then all of us took something. They took their hats, and I took my departure.

I went to a druggist and showed him the prescription.

"It will be two dollars 87 cents for an ounce bottle", he said.

"Will you give me a piece of your wrapping cord?" said I.

I made a hole in the prescription, ran the cord through it, tied it around my neck, and tucked it inside. All of us have a little superstition, and mine runs to confidence in amulets.

O. Henry

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[1] digitonasal feat – персто-носовой фокус

[2] disqualified percheron – забракованный першерон (лошадь-тяжеловоз)

[3] Madison Square Garden – место, где расположен манеж В Нью-Йорке

[4] Pears' = Pears' soap – туалетное мыло

Exercise 1. Choose the keywords and phrases that best convey the gist of the information.

Exercise 2. Draw up some dialogues and carry them on with your classmate in class.

Exercise 3. Render the contents of the text in Indirect Speech in English.

Exercise 4. Read and translate the text «I miss that young man!» in writing.

One day, a little old lady in her seventies came into a doctor's office for a consultation. She expounded all her ailments, real and imaginary, but seemed most concerned about a recurring dream in which she was pursued by a young man whose intention seemed dishonorable.

The doctor was properly sympathetic, and advised her how she might sleep more soundly. In a few days she returned, still woeful.

"Don't tell me you aren't sleeping better nowadays", teased the doctor.

"Oh, I'm sleeping just fine", the patient replied, "but to tell the truth, doctor, I miss that young man! "

Exercise 5. Insert prepositions or adverbs where necessary:

1. The consulting physician put me __ some coordination exercises. 2. I said __ him that I had no pain __ the back __ my head. 3. He told me to jump __ as fast as I could. 4. I obeyed as I __ was a good jumper __ my eyes shut. 5. The bathroom door which was only three feet __ was open. 6. As the doctor overlooked that fact my head struck the edge __ the door. 7. He offered me to touch my nose __ my right forefinger. 8. I took my finger __ __ the crack __ the bathroom door and performed the digitonasal feat. 9. Then he told me to gallop like a horse __ __ five minutes __ the room. 10. I gave the best imitation I could __ a disqualified percheron being led __ __ Madison Square Garden. 11. After the doctor had listened __ my chest he held __ his finger __ three inches __ my nose and told me to look __ it. 12. I asked him if he had ever tried Pears' soap __ washing his hands, but he went __ __ his test rapidly. 13. The doctor asked me __ look __ the bay and then __ his forefinger.

Exercise 6. Read the dialogue according to the given melody.

A.: Is 'that the /hospital?

B.: /Yes.

A.: I 'want to 'ask about Mr. /Smart, | who is in the 'sick-room at the /moment, I believe. I imagine he 'isn't 'fit to .come to the .phone him/self; | I 'just 'wanted to 'ask how he was.

B.: He is 'doing ↑ quite ,well, | 'definitely on the /mend.

A.: 'Thanks very /much. I'm 'glad to .know he is .getting .on all /right.

B.: 'Oh `yes, | he is 'getting 'on `quite /nicely.

A.: 'Tell him I'm 'glad he is .making .good /progress. Good-/bye.

B.: Good-/bye.

Exercise 7. Translate the sentences with the key word «toe» into Russian.

1. You've got two problems. One, what you do, and two, how it looks politically. You may stub your **toe** on number one, but there's no damn reason to fail on number two. 2. You'll have to be on your **toes** when I call you out. 3. Our boss is determined to keep us all on our **toes**. 4. I had all the coppers on their **toes**. 5. My new secretary is right on her **toes**. 6. You have to keep on your **toes** in this job. 7. He carries out random spot checks to keep everyone on their **toes**. 8. This is a **toe** in the door. 9. They met **toe to toe**. 10. He is on his **toe**.

Exercise 8. Translate the sentences with the key word «finger» nto Russian.

1. She jammed her **finger** in the door. 2. She turned (twisted) him round her (little) **finger**. 3. She has him wrapped around her little **finger**. 4. You will put your **finger** on it. 5. I point the **finger** of blame on you. 6. This is a **finger** alphabet 7. Nothing's done in the colony without his **finger** being in the pie. 8. He had the scientific world at his **finger-tips**, and was one of the shrewdest men I knew. 9. Winifred was here she'd make them all out with a wet **finger**. 10. Neat job so far. But keep the **fingers** crossed. 11. "Keep your **fingers** crossed, darling", she called to Bill. 12. You don't move (stir, lift) a **finger**. 13. They have a **finger** in the pie. 14. He was fingered as one of the escaped convicts. 15. I jump when she snaps her **fingers**. 16. The **finger** of suspicion points at / to you.

DIALOGUE «VISIT TO A SICK FRIEND»

NICHOLAS: What is the matter with your son? Why didn't he come to the Institute yesterday?

BOB'S MOTHER: Oh, you see, he was taken ill all of a sudden yesterday. He was feverish all over and complained of a headache. He had a terrible cold in the head and coughed a little. It seemed to me that he had all the symptoms of the flu. Of course, I put him to bed immediately, gave him an aspirin and a cup of hot tea with raspberry jam. I hoped he would recover by the morning, but he became even worse. So I called up the local polyclinic and asked for the doctor to be sent around.

NICHOLAS: Well, and how is he now?

BOB'S MOTHER: He is still very weak and he has a splitting headache.

NICHOLAS: What does the doctor say?

BOB'S MOTHER: Oh, the doctor who treats him says that there is nothing serious, he has bronchitis and a touch of the flu; we hope he will recover in a few days, provided he stays in bed. But nevertheless the doctor is afraid of complications setting in, so he insists upon his keeping his bed.

NICHOLAS: Did you take his temperature?

BOB'S MOTHER: Oh, yes, his temperature is rather high.

NICHOLAS: Did the doctor give him a close examination?

BOB'S MOTHER: Well, rather. He sounded his lungs and heart. He examined his throat. He felt his pulse, checked his blood pressure and tomorrow the nurse will come to take his blood count.

NICHOLAS: Where did he catch such a terrible cold?

BOB'S MOTHER: I can't say, but I think that the draughts at your Institute and the running from one building to another without an overcoat account for it.

NICHOLAS: Did the doctor give him a certificate of illness?

BOB'S MOTHER: Oh, yes, the doctor put him on the sick list and promised to come again in two days.

NICHOLAS: Did the doctor prescribe any medicine?

BOB'S MOTHER: Yes, he did. If you stay with him for a while, I'll go to the chemist's with the prescription and have the medicine made up.

NICHOLAS: All right. I'll stay with him for an hour. (*Conversation between the two friends*.)

NICHOLAS: Hello, old man. How do you feel now?

BOB: Well, not very well. My head is swimming and I feel feverish all the time, but I hope to get better in a few days, though my mother is afraid of complications that might result in pneumonia. Personally I don't think it is as bad as that. Well, and how is your wife? Is she better?

NICHOLAS: Thank you, she is much better now. But she is still in hospital. She was operated on for appendicitis. We were all relieved at that, as we feared it would turn out to be something worse. You know how everybody is afraid of cancer nowadays.

BOB: Oh, yes, but why such a terrible idea! She didn't complain of anything suspicious, did she?

NICHOLAS: Well, you see, her complaints seemed very symptomatic. She felt very weak and always had a sensation of nausea.

BOB: Who performed the operation?

NICHOLAS: Professor R., the well-known surgeon, did.

BOB: Was she given chloroform?

NICHOLAS: Oh, no, she wasn't but still she felt very poorly after the operation. Now she has almost recovered. I hope to take her home in a few days' time.

BOB: Well, I am very glad to hear that. It's a long time since. I had the pleasure of seeing her. Give her my best wishes for a speedy recovery. And how is everybody else at home?

NICHOLAS: Very well, thank you. Here is your mother back, so now she will take care of you, as I must be off. Hope to see you again soon. Bye-bye.

BOB: So long. Thanks for coming. My best regards to your mother and your wife.

NICHOLAS: Thank you. I expect to see you quite strong again in a few days.

Exercise 1. Learn the dialogue by heart and carry it on with your classmate in class. Render the contents of the dialogue in Indirect Speech in English.

Exercise 2. Remember how to translate English sentences.

1. Вчера у меня поднялась температура, и я почувствовала себя очень плохо.	Yesterday I mounted a high temperature and felt very bad.
2. У меня сильно болела голова и горло, был насморк и кашель.	I had a splitting headache, a sore throat, a cold in the head and a cough.
3. Вечером я едва держалась на ногах, у меня кружилась голова и температура была 38,3.	In the evening I could hardly stand on my legs, I felt giddy and was running a high temperature — 38.3 (thirty-eight point three)
4. Утром послали за врачом.	The doctor was sent for in the morning.
5. Врач попросил меня раздеться до пояса, выслушал меня, проверил пульс, сказал, что это грипп, и велел полежать несколько дней.	The doctor asked me to strip to the waist, examined me, felt my pulse and said that it was the flu; he told me to keep to my bed for a couple of days.
6. Врач выписал таблетки и микстуру (по столовой ложке три раза в день), прописал банки или горчичники.	The doctor wrote out a prescription for some pills and some medicine (a table spoonful three times a day), he also prescribed cups or mustard plasters.
7. Он сказал, что в следующий четверг мне сделают рентгеноскопию грудной клетки и анализ крови, чтобы убедиться, что всё в порядке и нет осложнений.	He said that Thursday week I should have my chest X-rayed and my blood examined to make sure that everything was all right and there was no complications.
8. Я рада, что у меня не воспаление легких и мне не будут делать уколов пенициллина.	I'm so glad that it is not pneumonia and I'll not have to receive penicillin injections.
9. Надеюсь выздороветь через неделю.	I hope, I'll be sufficiently recovered in a week.

TOPICAL VOCABULARY

arm – рука (от кисти до плеча)

to carry smth. under one's arm – нести что-л. под мышкой
to fling (put, throw) one's arms around smb. – обнять, заключить в объятия
to fold one' s arms – скрестить руки (на груди)
to greet smb. with open (outstretched) arms – встречать кого-л. с распростёртыми объятьями
to hold in one's arms – обнимать, держать в объятиях
to walk arm in arm with smb. – идти под руку с кем-л.
to work arm in arm – работать рука об руку, в тесном сотрудничестве
as long as one's arm очень длинный
at arm's length = at arm's end – на почтительном расстоянии
arm in arm – рука об руку, в тесном содружестве
a babe in arms – (сущий) младенец (о наивном, непрактичном человеке)
to have a long arm – "иметь длинные руки", настигать всюду
the long arm of coincidence – удивительное совпадение; редкий случай
to make a long arm – протянуть руку, потянуться за (чем-л.)
to put one's arm out further than one can draw it back again – не рассчитать своих сил
to throw oneself into smb.'s arms – искать защиты у кого-л.
to twist smb.'s arm – "выкручивать руки", оказывать давление
on the arm – бесплатно, даром; "в кредит", на дармовщинку
with one arm behind one's back – в беспомощном невыгодном положении

hand – a) рука (кисть) bare hands – голые руки

delicate (gentle) hands – изящные, нежные руки
to clap one's hands – хлопать, аплодировать
to clasp (grab, grasp) smb.'s hand – сжать кому-л. руку
to cup one's hands – сложить руки горстью
to hold (join) hands – держаться за руки
to lower (raise) one's hands – опускать / поднимать руки
to shake hands with smb. – здороваться с кем-л. за руку
to take smb.'s hand – пожать протянутую руку
to wring one's hands – заламывать руки
at hand – под руками, вблизи; в распоряжении
firm (iron) hand – строгий контроль
to fall into smb.'s hands – попасть кому-л. в лапы
to suffer at smb.'s hands – натерпеться от кого-л.
to get out of hand – выходить из-под контроля
guiding hand – направляющая рука
to give (lend) a hand – оказать помощь
to lend a helping hand – протягивать руку помощи
on the one hand – с одной стороны
on the other hand – с другой стороны
hands down – легко, без усилий
to live from hand to mouth – жить без уверенности в будущем; кое-как сводить концы с концами
to play into the hands of smb. – играть на руку кому-л.
to put (set) one's hands to smth. – предпринять, начать что-л.; браться за что-л.
to gain the upper hand – одержать победу, взять верх, одолеть; иметь превосходство, перевес, господствовать, быть хозяином положения
at any hand – во всяком случае

out of hand – решительно, наотрез; не раздумывая
to reject (refuse) smth. out of hand – не раздумывая; категорически отвергнуть
by hand – вручную; ручным способом
to bring up by hand – выкормить рожком, искусственно
for one's own hand – ради своей выгоды, в собственных интересах
hand and foot – по рукам и ногам
to bind hand – связать по рукам и ногам
hand and glove – в приятельских отношениях, на короткой ноге
hand over hand – быстро, проворно
to put the work in hand – начинать работу, приступать к работе
on one's hands – на чьей-л. ответственности; налицо, поблизости
all into bad hands – попасть в плохие руки
to fall into good hands – попасть в хорошие руки
to fold one's hands – сложить руки, бездействовать
to force smb.'s hand – принудить кого-л. к действию, заставить кого-л. раскрыть свои карты, обнаружить свои намерения
a fresh (green) hand) – неопытный человек; работник, новичок
to get one's hand in – набить руку, освоиться, поднатореть
to have (take) a hand in smth. – оказывать влияние на что-л., вмешиваться во что-л.
to have one's hands full – не иметь свободной минуты, хлопот полон рот
a (good, great, rare) crack hand at smth. – мастер своего дела; умелец, золотые руки
by the left hand – незаконнорождённый

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

Exercise 2. Translate the sentences with key word «toes, leg, finger» into Russian.

1. I'm poor but be careful. Do not tread too hard on my **toes**. 2. He is one that cannot make a good **leg**. 3. Your argument has not a **leg** to stand on. 4. Smallbones... came shambling, all **legs** and wings, up the hatchway... 5. He has done it with a wet **finger**. 6. My **fingers** itch (to do smth.). 7. I have been thinking o' flitting... and now I'm o' the mind to go in good earnest... better a **finger** off as aye wagging. 8. The number of monarchies now left in Europe can be counted on the **fingers** of one hand. 9. I keep my **finger** on he pulse of this company much more than you think. 10. Evans: "...All the other women in the world aren't worth your little **finger**!" 11. But since you will needs put your **finger** in the fire, truth must be spoken. 12. Mart, but honestly, any smart woman can twist you around her **finger**. 13. If... Winifred were here she'd make them all out with a wet **finger**.

Exercise 3. Remember the expressions.

A fair face may hide a foul heart. – За красивой внешностью может скрываться низкая душа.

"But can you work? Are you strong enough? " "I'm hard as goat's knees", Gina said. – А работать ты сможешь? Сил хватит? – Я вынослива, как хорошая лошадь, сказала Джина.

Exercise 4. Translate the proverbs

To get angry is to punish yourself with other people’s mistakes. Seven days without exercise makes one weak. Eat well, be active, feel good about yourself. Tri-colour meal is a good deal.

DIALOGUE «AT THE POLYCLINIC»

A week later Bob went to the local polyclinic to see the doctor. After waiting a few minutes for his turn he was called by the nurse in to the doctor's consulting room.

BOB: Good afternoon, doctor! I am quite all right now, I've come here to have my certificate of illness signed by you.

DOCTOR: Good afternoon! Do you think I'll sign a certificate without first examining you? Why did you leave home without my permission?

BOB: Well, you see doctor, my temperature has been normal for two days and I feel well enough to resume my work.

DOCTOR: Oh, no. The flu might lead to unexpected complications and I won't sign your certificate until I see the results of all the laboratory tests which I intend to put you through.

BOB: Oh, doctor, is it really necessary?

DOCTOR: It is absolutely necessary and above all I want to check the results of the X-ray examination of your heart and lungs. Strip to the waist, I'll sound your heart and lungs now.

BOB: Well doctor, I have no objections to that, only allow me to go back to my work. I assure you I am strong enough.

DOCTOR: Look here, you still have a murmur of the heart and there is a slight crepitation in the lungs. To-day you will go to the laboratory and undergo all the necessary tests. The day after tomorrow you will come here again and then we'll see. Now I'll prolong your certificate.

BOB: I am so sorry, doctor, that you are postponing my return to work.

DOCTOR: But you have not recovered yet. You are only a convalescent. Remember the proverb "Health is better than wealth." Take care of your health! Good-bye for the present, be sure to come and see me the day after tomorrow.

BOB: Good-bye, doctor! And thank you ever so much.

Exercise 1. Answer the questions.

1. What is the matter with you? 2. Have you taken your temperature? 3. What is your temperature? 4. Has the doctor examined you? 5. When did you catch cold? 6. What did the doctor prescribe? 7. Did the doctor check your blood pressure? 8. Did the doctor order you to keep your bed? 9. Were laboratory tests called for? Were you X-rayed? 10. What do you complain of now? 11. How long have you been ill? How did it begin? 12. Are you very feverish? 13. Have you sent for the doctor? 14. What has the doctor diagnosed? 15. What has the doctor prescribed? 16. Did the doctor order you to keep your bed? 17. Did the doctor prolong your certificate of illness? 18. Does your head still ache? 19. Shall you still take medicine? 20. What are the symptoms of the flu? 21. When were you ill last time?22. How long were you convalescing? 23. What laboratory tests is it necessary to undergo to get an accommodation to a sanatorium? 24. In what sanatorium have you been convalescing after your sickness? 25. Have you completely recovered?26. Do you feel well now?

Exercise 2. Supply articles where necessary.

1. The old man was seriously ill. He was running ____ high temperature. 2. I've ____ bad cold in ____ head. I must have caught ____ cold yesterday when I ran out into ____ yard without ____ cap on. 3. She overworked and had ____ bad headache. People who do not get enough sleep often have ____ headaches. 4. I have but ____ slight headache. No pills for me, thank you. 5. I have ____ splitting headache and ____ bad cold in ____ head. I must have caught cold and developed ____ grippe. 6. " I'll put you on ____ sick-list for three days," the doctor said. "Keep to bed. You'll be in ____ good health by ____ end of ____ week, I hope." 7. Try as the doctors may, no effective treatment for cancer has as yet been developed. 8. He was treated for chicken-pox but it turned out to be ____ scarlet fever. 9. I just can't stop sneezing, and I've got ____ splitting headache, and on top of that I have ____ sore throat.

Exercise 3. Supply adverbs or prepositions where necessary.

1. __ night I felt a sharp pain __ the side and __ the leg. 2. You are losing weight and you do look like a sick man __ me. Why don't you go and consult __ a doctor? Health is worth taking care __. Haven't you lived long enough to know that? 3. Most unfortunately he fell ill __ pneumonia just __ the middle of his holiday when he was on a tour down South. 4. The boy falls ill __ quinsy practically every other month. He must be operated __ and have his tonsils removed. This is the only right thing to do __ the circumstances. Otherwise the quinsy will keep him __ school __ days __ end. 5. Cancer is one __ the most devastating diseases. There are many hospitals where cancer research is carried __. Many outstanding doctors have devoted their lives __ the study of this disease. 6. I must have caught the 'flu on coming ___ an overheated cinema __ the cold, damp air. I thought, judging __ the symptoms, that it was only a cold, but when my temperature rose and my headache grew worse I sent __ a doctor. He looked __ my tongue, felt __ my pulse, listened __ my heart and lungs and took my temperature, "It's quite clear what's wrong __ you," he said. "You've got the grippe. Keep __ bed for a few days and drink hot tea __ lemon. I'm going to make __ a prescription tables in case your headache gets any worse. They ought to give you instant relief. I'll make you __ a prescription __ a mixture too. two days I'll come and see you again. "Somebody took the prescription __ a chemist's and had it made. __ I got __ the illness five days. Luckily there were no complications __ it. In ten days I was hale and hearty again.

Exercise 4. Speak or write on one of the topics.

- You complain to the doctor of the illness you have.
- You are examined by the doctor who gives you the necessary recommendations.
- You come to see your sick friend.
- You come to a chemist's to get some medicine made up for you.
- You discuss the system of Public Health in our country and the USA.
- You discuss the problem "Health and Sport".

Exercise 5. Complete the sentences.

1. Thanks to vaccination against smallpox... . 2. The mortality rate from such diseases as TB, dysentery, diphtheria, and measles has considerably diminished owing to... .3. If urgent medical aid is called for we... and... .4. All victims of traffic accidents are... . 5. In our country extensive research work against infectious diseases... . 6. People have to undergo medical examinations and produce certificates of sound health when (if) they... . 7. If there is an inflammation somewhere in your system, the blood tests .... . 8. Chloroform or an anesthetic, given to a patient before an operation... . 9. Prescriptions for pills, mixtures and ointments are made out by doctors while the chemists... .10. It hurts when you swallow if you.. .. 11. A sore throat is usually the result of... . 12. The doctors order us to keep to bed in case... . 13. The last time I saw the doctor I complained of... and he diagnosed the case as... . 14. The doctor felt my pulse, listened to my heart and lungs and... . 15. In order to cure a sick man of the grippe the doctors will usually advise... .16. If I have a splitting headache I usually... . 17. After examining their outpatients the doctors of a local polyclinic will make daily rounds of their districts to ... . 18. People who easily catch cold (who are susceptible to cold) should... . 19. Tuberculosis is successfully combated in our country by... . 20. Penicillin has helped to cure... . 21. A splinter should not be neglected because... . 22. If there is a cavity in a tooth the dentist... . 23. If a child falls ill with scarlet fever it... . 24. To take our temperature we get a thermometer and... .

Exercise 6. Speak or write on one of the topics.

1. A visit to a doctor. 2. A visit to a sick friend. 3. How I fell ill. 4. At a health-resort or a sanatorium. 5. Why some people go down with a chill so often. 6. How people can harden their bodies by means of exercises. 7. Why you hate (or like) going to doctors. 8. Say a few words about possible complications after quinsy (scarlet-fever, flu). 9. My bad luck – I always fall ill when holidays begin. 10. Why we can't do without doctors.

DIALOGUE «CALM YOURSELF!»

The patient has been in hospital for several weeks. He is worried. He wants to know the truth.

PATIENT: Am I going to get better, Doctor?

DOCTOR: As you know you are still quite ill.

PATIENT: Yes, I know, Doctor. And yet, tell me the truth. I don't want to go on with false hopes.

DOCTOR: I've been studying your case in my medical books, I've done a lot of research.

PATIENT: Don't try to soften the blow. Tell me the truth, no matter what it is.

DOCTOR: You are going to get better.

PATIENT: Wonderful! But I don't understand why you say so. The other doctors told me the case is fatal. How do you know I'm going to feel better.

DOCTOR: I'm a scientist. I've studied your case carefully. We'll continue the present treatment because I trust in the scientific statistics.

PATIENT: And do these statistics show that I'm going to get better?

DOCTOR: Exactly! It's a known fact that ten % of all the patients with this disease get better.

PATIENT: What? Only 10% ? But that's terrible! Does that mean that I have only one chance in ten of getting better? Are you trying to deceive me when you tell me I'm going to feel better?

DOCTOR: Calm yourself! Calm yourself! You don't understand these things. It's a scientific problem.

PATIENT: Please, Doctor, explain!

DOCTOR: All right. As you will see there are other factors that have to be considered.

PATIENT: What other factors? Please tell me.

DOCTOR: Listen to me. You are the tenth patient that I have treated for this disease.

PATIENT: So what? I'm the tenth patient that you've treated for this disease... I still don't understand!

DOCTOR: Simple mathematics, my good man. You are the tenth patient, you have to get well, because the other nine died!

Exercise 1. Learn the dialogue by heart.

Exercise 2. Translate the sentences with key word «shoulder» into Russian.

1. That rude man **shouldered** me aside and got on the bus. 2. When jobs are scarce, young people entering the work tend to get **shouldered** aside in favour of experienced workers. 3. "Did he come to cry on your **shoulder**?" "No. He came to discuss a business project". 4. Have I not always had my **shoulder** to the collar? 5. If the scientists, representing a segment of a nation's people work **shoulder** to **shoulder** in mutual harmony, then it will be a step toward the ultimate goal of world peace. 6. This has been made a test case, all who would prosper in the future must put a **shoulder** to the wheel. 7. I haven't bothered with business. The doctor told me I mustn't even think of it. I put it all on Bob's **shoulders**. 8. It is embarrassing to have someone looking over your **shoulder** while you're at work, as though you could not be trusted. 9. I am sure if you were to go there; you would cut and come again – one **shoulder** of mutton drives down another. 10. After a time the man began to open out his **shoulders** and struck right and left. 11. Robin... had much responsibility upon his **shoulders**. 12. What a relief it is not to have to look over your **shoulder** before you speak to a companion in a cafe or any similar public place. 13. Leslie will have to bear the burden of all these troubles. Fortunately he is in a good position and has broad **shoulders**.

***Exercise* 3. After reading the text speak of the health system development in our country.**

The health care system lays still more emphasis on the prevention of ill health, for it is easier to advert a disease than to cure it. It is planned to extend the network of preventive treatment centres and build more general and specialized hospitals, clinics, and diagnostic centres. Many new hospitals and outpatient clinics are to be built in rural areas. It is planned to continue expanding the network of health-resort facilities, including health-building centres for parents and children, and preventive treatment centres operated by enterprises.

CONVERSATIONS

Doctors & Patients

PATIENT: Can these operations be performed safely, doctor?
DOCTOR: That, my dear sir, is just what we are about to discover.

YOUNG DOCTOR: Why do you always ask your patients what they have for dinner?
OLD DOCTOR: It's a most important question, for according to their menus I make out my bill.

I saw the doctor today about my loss of memory. What did he do? Made me pay him in advance.

The doctor smiled as he entered the room. You look much better today.
Yes. I followed the directions on your medicine bottle. What were they?
Keep the bottle tightly corked.

"I don't like your heart action," the doctor said, applying the stethoscope again. "You have had some trouble with angina pectoris, haven't you?" "You're right in a way, Doctor," said the young man sheepishly, "only that isn't her name."

A doctor was called in to see a rather testy aristocrat.
"Well, sir, what's the matter?" he asked cheerfully.
"That, sir," growled the patient, "is for you to find out."
"I see," said the doctor thoughtfully. "Well, if you'll excuse me for an hour or so I'll go along and fetch a friend of mine - a veterinarian. He is the only chap I know who can make a diagnosis without asking questions."

A member of the faculty in a London medical college was appointed an honorary physician to the king. He proudly wrote a notice on the blackboard in his classroom: "Professor Jennings informs his students that he has been appointed honorary physician to His Majesty, King George." When the professor returned to his classroom in the afternoon he found written below his notice this line: "God Save the King."

SHE: Did the doctor diagnose your case? HE: Yes.
SHE: How long did it take? HE: About a minute and three quarters. I had on an old suit.

"Doc," said he, "if there is anything the matter with me, don't frighten me half to death by giving it a scientific name. Just tell what it is in plain English."
"Well," said the doctor, "to be frank with you, you are just plain lazy."
"Thank you, doctor," sighed the patient with relief. "Now give me a scientific name for it, so I can go home and tell the missus."

"Don't you think, doctor, you've rather overcharged for attending Jimmy when he had the measles?" "You must remember, Mrs. Brown, that includes twenty-two visits." "Yes, but you forget he infected the whole school!"

Physician's Wife: Now my dear, you must positively forget shop if you are going into society with me. Her Husband: What have I done?
Physician's Wife: Why, you feel the pulse of everyone who extends a hand.

"Doctor," asked a patient, "I am feeling much better now, and I want you to let me have your bill." "Nonsense, sir," said the physician, "do be calm; you are not strong enough for that yet!"

Mrs. Jenkins, on being shown into the doctor's consulting room, immediately started on the long story of her troubles. The doctor, to whom she was a regular visitor, endured it patiently and gave her another bottle. At last she prepared to go out, and the doctor was congratulating himself when she stopped and exclaimed, "Why, doctor, you didn't look to see if my tongue was coated." "I know it isn't," wearily replied the medical man. "You don't find grass on a racetrack."

A doctor who had taken up as his specialty the treatment of skin diseases, was asked by a friend how he happened to select that branch of medicine.

"There were three perfectly good reasons," replied the physician. "My patients never get me out of bed at night, they never die; and they never get well."

Even the best of specialists often fall down in their diagnoses.

"Ah," said the doctor looking into one eye, "it is easy for me to see what is the matter with you!

This is not merely eye trouble; it is an affection of the nervous system. There are all the signs of liver trouble, of fatty degeneration of the heart, of a bad blood supply. The only thing I can recommend is -" "Here, here!" cried the patient. "Isn't it about time you looked into the other eye? That's my glass one, you know."

"My little daughter has swallowed a gold piece and has got to be operated on. I wonder if Dr. Robinson is to be trusted?" "Without a doubt. He's absolutely honest."

PATIENT: Do you extract teeth painlessly?

DENTIST: Not always - the other day I nearly dislocated my wrist...

FIRST DOCTOR: You have cured your patient. What is there to worry about now?

YOUNGER DOCTOR: I don't know which of the medicines cured him.

The doctor said he'd have me on my feet in a fortnight. And did he?

Sure. I've had to sell my automobile.

DOCTOR (complacently): You cough more easily this morning.

PATIENT (querulously): I should. I've been practicing all night.

DOCTOR: I can do nothing for your complaint. It is hereditary.

PATIENT: Then send the bill to my father.

Doctor, I want you to look after my office, while I'm on my vacation.

But I've just graduated, doctor. I've had no experience.

That's all right, my boy. My practice is strictly fashionable. Tell the men to play golf and ship the lady patients off to Europe.

DOCTOR (ecstatically): Sir, yours is a case which will enrich medical science!

PATIENT: Oh, dear, and I thought I wouldn't have to pay more than five or ten dollars!

PATIENT: Doctor, I'm bothered with a queer pain. When I bend forward, stretch out my arms and make a semicircular movement with them, a sharp sting comes in my left shoulder.
DOCTOR: But why make such motions?
PATIENT: Well, if you know any other way for a man to get on his overcoat, I wish you'd let me know.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Read and remember the dialogues.

Hi, the hero of the day! Here you are, safe and sound! How are you feeling, pal? Cheer up, you look great!	Привет, герой! Вот ты где, целый и невредимый! Как себя чувствуешь, дружище? Выше нос, ты прекрасно выглядишь!
Hello, friends! It's great to see you here. Oh, Lord! I'm happy that's over. I wouldn't go through it again for a million dollars! And thank God I don't have to! All those drops, pills, ointments, powders, potions adhesives and bandages! I hate the very sight of them!	Привет, ребята! Здорово, что я вас вижу. О Господи! Я так счастлив, что все уже позади! Я бы не согласился испытать все это еще раз и за миллион долларов. И слава Богу, мне не придется больше страдать. Все эти капли, пилюли, мази, порошки, микстуры, пластыри и бинты! Я на них просто смотреть не могу без отвращения.
Do you? So do I. But how do you know you won't have to go through it again soon?	Да? Я тоже. Но откуда ты знаешь, что тебе не придется больше с этим сталкиваться?
Because my appendix is out. But for my appendix I'm quite fit. I've never suffered from a toothache, headache, insomnia or constipation. My heart, stomach, liver, kidneys are normal. The whole things are done!	Потому что аппендикс мне вырезали. А если не считать аппендикс, то я в прекрасной форме. Я никогда не страдал ни от зубной боли, ни от головной боли, бессонницы или запора. Сердце, желудок, печень, почки все у меня в порядке. Все плохое позади!
Who would have thought that you had just undergone an operation!	Кто бы мог подумать, что тебя только что прооперировали!
Hm-m... That's what I thought when I had an internal surgery a few years ago. But what happened? Fifteen minutes after I had come to, they were rushing me back upstairs and opened me up all over. One of those careless doctors had left his lancet inside of me.	Хм, я вот тоже так думал, когда меня оперировали несколько лет назад. И что же? Через 15 минут после того, как я пришел в себя, меня повезли обратно в операционную и вскрыли все швы. Один из этих рассеянных докторов зашил ланцет мне вовнутрь.
Huh, you got lucky. When I was operated on, they had to take me back to the table and rip all my stitches out to get pair of steel scissors. The way those guys, those doctors mislay things...	Ха, тебе еще повезло. Вот когда меня оперировали, то меня тут же положили обратно на стол и им пришлось повынимать из меня все швы, прежде чем они нашли пару стальных ножниц, которые зашили в меня. Ох, эти парни, эти врачи, они всегда что-то куда-нибудь не туда зашьют.
Good morning, everybody. Well, how does it feel, young man? I've just come to look for my eyeglasses. Can't find them since yesterday's operation...Oh, what's this? The patient fainted! Bring in the nurse, please. Be quick. He needs an injection. It must be the after-effect of the anesthetic.	Доброе утро всем. Ну-ка, как мы себя чувствуем, молодой человек? Я просто так забежал, ищу свои очки. Не могу их найти со вчерашней операции... О, что это? Пациент потерял сознание! Позовите сестру, пожалуйста! Скорее. Ему нужно сделать укол. Это, должно быть, последствия наркоза.

Exercise 3. Make up a small report and give a talk in class.


We are ONE
We are HONEST
We are RELIABLE
PDA's CORE VALUES
We are CREATIVE
We are PROUD
We are ACCOUNTABLE

UNIT II. TO CALL IN A DOCTOR

INTRODUCTION

Making the decision to call your pediatrician can sometimes be a tricky one, especially late at night. On one hand, you don't want to cry wolf – bothering your doctor every time your child sneezes.

On the other hand, you certainly don't want to miss any critical symptoms. Pediatrician Angela Thompson-Busch M.D., Ph. D., believes that it's better to err on the side of caution. "I think parents should let the doctor decide whether or not a trip to the doctor's office is necessary," she advises.

Here, she helps you decide on the severity of your child's illness as well as the best course of treatment. After an episode of vomiting, it is best to wait for one hour before allowing your child to drink anything. Then give your child a few small sips of clear liquid (electrolyte solution, soda pop, Popsicles). If this stays down for 15 minutes continue to give fluids in moderation every 15 minutes for at least four hours before progressing to food. When these measures don't work, the child may ultimately become dehydrated. Persistent vomiting for more than 24 hours should be evaluated by your child's doctor. This is especially true if there is no accompanying diarrhea. Vomiting and fever alone may be signs of a urinary tract infection, strep throat or appendicitis. If your child is having episodes of vomiting that are bloody, a thick green color or projectile, this could indicate an injury or a blockage in the bowel and should be considered a medical emergency.

When your child is ill, especially the first time, it can be very frightening. In order to help your doctor make the best diagnosis, however, it is important that you remain calm. It can be helpful to sit and jot down a few notes about your child's overall condition before you make that call. This ensures that you forget nothing and that the answers to any questions your doctor asks will be there at your fingertips. These are some things your doctor will need to know about your child:

- **Symptoms:** Is he vomiting? Does he have diarrhoea? What is the colour and general appearance of his skin? Are there any visible changes in the appearance of his eyes? Is he able to move his limbs freely?
- **Mood:** Is he crying more than usual? Does he seem tired or listless? Does he appear to be irritable or overstimulated?
- **Sleep:** Note the time and duration of regular sleep and naps for the last 12 hours or since the onset of illness.
- **Eating:** List all food (solids and liquids) he has consumed with amounts and times. Note if he was unable to keep any of these foods down.
- **Temperature:** Be sure you take your child's temperature before you call the doctor. Write down the temperature, when it was taken and how it was taken.
- **Medicines:** Keep track of any medicine your child is regularly taking or any you may have given him as a result of this illness. Know the dosage and times given.

Keeping a level head and gathering the right information will help you and your doctor get your child back on the road to good health.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Answer the questions on the text below.

1. Who is the main hero of the story? 2. What did happen? 3. What did she complain about? 4. How well did he look? 5. Who is the second character of the story? 6. What did he do? 7. What did the doctor do? 8. What did he prescribe? 9. How can you continue the story? 10. What is your attitude to the main heroes of the story? 11. Can your remember your own story? 12. Were you in such a situation?

Exercise 3. Read the fragment fron «Not like this» by Jane Walsh Abridged and render the main idea of its contents briefly in English.

Mo-Mo is ill

Mo-Mo went down with a chill, or so I thought. She came home from school one Monday afternoon complaining about a headache. She really looked seedy. I tucked her up in bed and gave her hot drinks. The next morning she seemed quite normal again, but I kept her in bed just to be on the safe side. The day after she was just as bad as ever, and had a very high temperature.

I ran down to the doctor without stopping to put on an outdoor coat.

"Really," the doctor mumbled, "you mothers seem to think I have nothing else to do but run around after your children. Children are always running temperatures. Ah...well...I'll come in and see you later." When she came it was eleven o'clock at night. She woke Mo-Mo, took her temperature and felt her pulse. Then she gave me two tables for her and a prescription for more. I told her Mo-Mo's legs seemed to be affected but she just wasn't listening. She gave me a mumbled sort of lecture on running for the doctor whenever there was the slightest thing wrong with a child, and, still mumbling, went home. She promised to look in again the following morning. But the next few days were anxious ones for me. Mo-Mo was really ill and the doctor never came. I sat up with her every night, trying to warm her little legs. She had no use in them and they were always cold. Late on Sunday night the doctor came again. She was still tired and said she would look at Mo-Mo's legs the following day. I went off to work the following morning with a very heavy heart. My little one did not seem any better at all. I was working part-time for two business ladies, cleaning their flat and giving their invalid brother his midday meal. I was only half way through my work when the doorbell rang. It was the doctor. She had been to see Mo-Mo and then followed me to work. I could not speak. I just looked at her.

"Why didn't you tell me about your little girl's legs?" she demanded. "But I did," I said, "surely you can't have forgotten?" "Oh, no, you did not. You said it was pneumonia," she fired the statement at me. "But I can't have done. I don't know now what it is." Then the doctor blurted out. " I've sent for an ambulance. Your little girl has infantile paralysis." Polio! My little girl with polio! My legs felt like water. I sat down on the stairs.

Exercise 4. Draw up a dialogue from the text and carry it on with your classmate in class.

Exercise 5. Analyze the vocabulary notes, learn them by heart.

1. *to go down with a chill* – слечь (от простуды)
Syn. expr.: to catch (a) cold (a chill) – простудиться
to catch a bad cold (chill) – сильно простудиться
2. to complain of (about) a headache (earache, toothache, stomachache) – жаловаться на
She has a (bad, splitting) headache. – У нее (сильная) головная боль.
to suffer from a headache – страдать от головной боли
the best remedy for a headache – лучшее средство от головной боли
I have a sore throat. – У меня болит горло.
a cold in one's head } насморк
a running nose
3. *to look seedy* – плохо выглядеть
После глаголов *to look, to feel* употребляется прилагательное:
to look bad (ill, tired, beautiful, healthy, excited, well, unwell, poorly, etc.)
to feel bad (tired, ill, well, unwell, poorly, etc.)
Why are you looking so poorly? – Because I'm feeling tired.
Прилагательные well, unwell, poorly совпадают по форме с наречиями.
4. ... *she was just as bad as ever* – ...ей не стало лучше
5. *I kept her in bed to be on the safe side*. – Я на всякий случай уложил ее в постель.

to keep (to) one's bed – лежать в постели, болеть, быть больным

to stay in bed – лежать в постели

to keep (to) one's room – не выходить на улицу

She doesn't keep (to) her bed, but she still keeps to her room.

6. *a high (low, normal) temperature* – высокая (низкая, нормальная) температура

a thermometer – градусник

to be running a temperature – be suffering from a fever or high temperature

to take one's temperature – измерять температуру

7. *you mothers seem to think I have nothing else to do but run around after your children* – вы, матери, кажется, считаете, что мне нечего больше делать, кроме как возиться с вашими детьми

But, *except* – употребляются в значении "кроме", "за исключением", причем после but инфинитив употребляется без частицы to. Everybody is ready but me (except me). I can do nothing but wait (except to wait). There was nothing but (except) pencils in the box.

Если же "кроме" означает "сверх", " в дополнение", то употребляется *besides*. *Cp.*: He does not know any foreign languages except (but) French.(кроме, за исключением)

He knows two foreign languages besides French. (кроме, в добавление)

8. *I'll come in. She promised to look in again.*

В данном контексте глаголы to come in, to look in означают "заглянуть", "зайти", "навестить". *Syn.*: to call on smb. – навестить кого-л., посетить кого-л.

9. *a prescription* – рецепт

to prescribe some medicine (a mixture, drops, powders) – прописать лекарство (микстуру, капли, порошки)

to have a prescription made up at the chemist's – заказать лекарство в аптеке

10. *I told her Mo-Mo's legs seemed to be affected* – Я сказала ей, что у Мо-Мо, кажется, что-то случилось с ногами

11. *to be ill (with)* – болеть (чем-л.), быть больным

to fall ill (with) – заболеть (чем-л.)

ill – употребляется в функции именной части сказуемого

sick – в значении "больной" употребляется в функции определения:

a sick man – больной (человек) she is sick – ее тошнит (*Amer*. - она больна)

12. *The doctor never came*. – Врач так и не пришел. Наречие never может употребляться с целью эмфазы; в этих случаях оно переводиться "так и не":

I had been impatiently waiting for his letter, but it never came.

13. *She had no use in them (legs)* – зд. Они (ноги) не действовали

use (*n)* – польза, смысл

to be of (great) use – быть полезным to use (*v*) – пользоваться

to be of no use – быть бесполезным

This dictionary is one of great use to me.

Don't take this mixture. It's of no use now.

Why don't you use the duster to clean the blackboard?

14. *my little one* – зд. my little girl (my darling) доченька, дочурка

15. *to work part-time* - работать неполный рабочий день

16. *You can't have forgotten.* – Не может быть, чтобы вы забыли.

I can't have done (it). – зд. Не может быть, чтобы я сказала это

17. *to fire smth at smb* выпалить; резко сказать;
to blurt smth out сказать, не подумав

18. *polio* (сокр. от poliomyelitis – полиомиелит, детский паралич

19. *My legs felt like water*. – У меня подкосились ноги.

Exercise 6. Draw up a dialogue from the text and carry it on with your classmate in class.

Nick Simthon got up in the morning with a head as heavy as a ton of bricks.

"What's the matter?" his wife asked. " You're looking rather seedy."

"I have a splitting headache, it hurts me when I swallow, and I feel sore all over."

"You'd better stay in bed to-day. I'll call the doctor (I'll have the doctor in)".

She called up the local polyclinic, gave the patient's name and address and was told when to expect the doctor's call. After the doctor had washed his hands he asked to see the patient. He felt Nick's pulse and asked: "What was your temperature this morning?" "37.5." "Where do you feel a pain? What's troubling you?" "Everywhere. I feel as though I were black and blue all over." "Do you ears ache or buzz?" "No."

"Any sensation of nausea (Do you feel sick)?" "Yes." "Does it hurt when I press here?" "No." "Well, you have all the symptoms of influenza. You'll have to keep to your bed for three days at least. And if your temperature doesn't drop, we'll have to send you to hospital." "Perhaps he ought to have penicillin injections, doctor," Nick's wife asked. "No, there's no need yet.

Just keep him warm and give him lots of hot tea with lemon. No reading in bed. Keep him on a light diet. I'll make out a prescription for pills to keep the fever (temperature) down. And this mixture is for your throat. Gargle every two hours, and take one table-spoonful of this three times a day. And don't forget to shake it well before use. Here is the medical(sickness) certificate. In whose name do I make it out?" "Nick Simthon." "Place of employment?" "Motor Works." And in the column "Diagnosis" the doctor wrote "influenza". (He diagnosed the case as influenza)."I'll be back in three days. Don't get up without my permission. There might be complications." "Thank you, doctor. Good-bye."

Exercise 7. Analyze the vocabulary notes attentivly.

1. *to look seedy* – плохо выглядеть

2. *sore* – болезненный, воспаленный

Word combinations: to have a sore eye, throat, foot. The word "sore" can also be used figuratively, e.g. a sore subject, spot больной вопрос, больное место.

3. *to feel black and blue all over* – чувствовать себя всего избитым

4. *nausea* – чувство тошноты

e.g. He was overcome with nausea after eating some bad food.

Note that in A.E. to be sick = to be ill – болеть; in B.E. to be sick = to feel nauseous, e.g. I feel sick. When used attributively "sick" means больной both in B.E. and A.E. e.g. He is a sick man – Он больной человек.

He is sick. $\begin{cases} \text{A.E. Он болен.} \\ \text{B.E. Его тошнит.} \end{cases}$

5. *to hurt* – повредить, причинить боль, ушибить, вызвать боль при прикосновении и т.п.

e.g. He was more frightened than hurt. He hurt his arm when he fell. My shoe is too tight; it hurts me. It hurts the eyes to look at the sun. He can't stand criticisms of any kind and always feels hurt.

6. *to keep the fever down* – сбить температуру



Exercise 8. Read the text «At the doctor's» and answer the questions.

My mother suddenly fell ill (was suddenly taken ill). She mounted a high temperature and felt very bad. She had a splitting headache and a cough. We sent for doctor Smith – our district doctor. Doctor Smith came, removed her coat and put on the white gown which she kept in her bag.

The doctor asked my mother to strip to the waist. She examined her, felt her pulse and took her temperature. The doctor said it was the flu and told my mother to keep to her bed. The doctor wrote out a prescription for some pills. Besides the doctor prescribed cups or mustard plasters, as well as a hot-water bottle to the feet. Next doctor Smith wrote out a slip for X-ray and blood examination.

The doctor put down everything she found in my mother's patient's file. The prescription which the doctor left was made up at the chemist's. We followed the doctor's instructions and in two weeks my mother felt much better. I took her to the policlinic for a check-up. We went to doctor Smith's consulting room which is on the first floor. While waiting for my mother who went to the doctor, I looked through the stands containing diagrams with first aid procedures and the coloured photographs of certain diseases and their symptoms. Soon my mother came out. The doctor said she had fully recovered.

What were symtoms of a disease of the mother? What did the doctor do? What did the doctor say after the examination? What kind of prescription did he make? What was happen then? Did the mother soon fully recover?

Exercise 9. Read the fragment from «Rebecca» by Daphne du Maurier and render its contents briefly in English.

Mrs. Van Hopper's illness

The morning after the bridge party Mrs. Van Hopper woke up with a sore throat and a temperature of a hundred and two (38,8 C). I rang up her doctor, who came round at once and diagnosed the usual influenza. "You are to stay in bed until I allow you to get up," he told her; "I don't like the sound of that heart of yours, and it won't get better unless you keep perfectly quiet and still. I should prefer," he went on, turning to me, "that Mrs. Van Hopper had a trained nurse.

You can't possibly lift her. It will be only for a fortnight or so." I thought this rather absurd, and protested, but to my surprise she agreed with him. I think she enjoyed the fuss it would create, the sympathy of people, the visits and messages from friends, and the arrival of flowers. "The nurse would give her injections, and a light massage, and she would have a diet," the doctor said.

I left her quite happy after the arrival of the nurse, propped up on pillows with a falling temperature, her best bedjacket round her shoulders and be-ribboned boudoir cap upon her head. Rather ashamed of my light heart, I telephoned her friends, putting off the small party she had arranged for the evening, and went down to the restaurant for lunch, a good half hour before our usual time. I expected the room to be empty, nobody lunched generally before one o'clock.

Exercise 10. Translate the sentences into English.

1. Почему он все еще дома? 2. Вы еще не видели врача, который лечит вашего сына? 3. Какие еще болезни у вас были в детстве? 4. Вы должны давать ему это лекарство еще три дня. Он все еще кашляет. 5. Мой брат еще не работает, так как он все еще болеет. 6. Что еще вы хотите купить в аптеке? 7. Дайте мне еще один порошок. У меня очень болит голова. 8. Он пошел в аптеку и заказал еще одно лекарство от желудка. 9. Он еще не поправился. 10. Кому еще вы должны сказать, что Петров заболел? 11. Вы все еще не выходите на улицу? 12. Какое еще лекарство врач прописал вам от горла? 13. Лекарство еще не готово. 14. У нее все еще высокая температура. 15. Кто еще осматривал этого больного? 15. После такой работы я чувствую себя разбитым. 16. Я два дня после этого лежал пластом. 17. После этой пробежки трусцой я устаю как черт. 18. Я отправился домой из офиса усталый, как обычно. 19. Его сегодня нет, он болеет. 20. От сплетен меня тошнит. 21. Он до смерти испугался. 22. Мы устали от бюрократии. 23. Она устала ждать. 24. Ему очень хотелось увидеть её. 25. Мне смертельно надоел этот остров. Эти места чужие мне, здесь я никогда не буду счастлив.

DIALOGUE

DOCTOR: What troubles you?

PATIENT: I'm quite unwell. I feel giddy and I can hardly stand on my legs.

DOCTOR: Any pain?

PATIENT: Yes. I've a sore throat and a cough.

DOCTOR: What is your temperature?

PATIENT: I'm been running a high temperature since yesterday. To-day it is 38.5 (thirty eight point five).

DOCTOR: Please strip to the waist and lie down on the examination couch. I shall examine you. How long have you felt this way?

PATIENT: Several days already. I've been taking pills for the 'flu, and yesterday I was cupped, but I don't feel any better.

DOCTOR: Why did you not come to the policlinic before?

PATIENT: I thought it would pass. I was down with the 'flu last month and I cured myself.

DOCTOR: Now you must lie down at once, complications may set in, your case will be serious.

PATIENT: What is the matter with me?

DOCTOR: I'm afraid it is pneumonia, and you must receive penicillin injections. I shall send a nurse to your home immediately.

PATIENT: Shall I have to stay in bed long?

DOCTOR: No, in a week or ten days, I hope, you'll be sufficiently recovered to go out. Please take this slip to the reception office in the clinic on Tuesday fortnight, and you will have your chest X-rayed and your blood examined to make sure that everything is all right.

PATIENT: Shall I take any medicine?

DOCTOR: Yes, certainly. Here is a prescription for you. Take a table spoonful of this medicine three times a day. Shake the bottle well before using.

PATIENT: Thank you ever so much, doctor.

DOCTOR: Oh, don't mention it, please. Be sure to follow my instructions. If you don't feel better send for me immediately.

Exercise 1. Learn the dialogue by heart and carry it on in class.

Exercise 2. Translate into Ukrainian the fragment from "The Citadel" by A. J. Cronin

While the husband stood by in the cramped, ill-lit stone-floored room, Andrew Manson examined the patient with scrupulous care. There was no doubt about it, she was ill. She complained that her head ached intolerably. Temperature, pulse, tongue, they all spoke of trouble, serious trouble.

What was it? Andrew asked himself that question with a strained intensity as he went over her again. His first case. Oh, he knew that he was overanxious! But suppose he made an error, a frightful blunder? And worse - suppose he found himself unable to make a diagnosis? He had missed nothing. Nothing. Yet he still found himself struggling towards some solution of the problem, striving to group the symptoms under the heading of some recognized disease. At last, aware that he could protract his investigation no longer, he straightened himself slowly, folding up his stethoscope, fumbling for words.

"Did she have a chill?" he asked, his eyes upon the floor. "Yes, indeed," Williams answered eagerly. He had looked scared during the prolonged examination.

"Three, four days ago. I made sure it was a chill, Doctor."

Exercise 3. Using the words and expressions given below tell about your visiting a hospital.

Hospital, to leave one's coat in the cloak room, to get a check, to go to the registration office, to get a slip, doctor's consulting hours, consulting room, to trouble smb., a sore throat and a cough, to take pills, the flu, to cure oneself, to cup, to stay in bed, to make a diagnosis, to ache, to examine a patient, to group the symptoms, to recognize disease, to aware, investigation, temperature, pulse, tongue.

Exercise 4. Read the text by A. Johnston and be ready to explain the words in quotation marks.

There is no «saving up for the holidays»

When a certain Frieda invited me recently to call on her at her summer holiday quarters I accepted gladly. For one thing, this Frieda, for all her sixty-four years, has well earned the sobriquet Frieda Hurricane, and I had never seen this hurricane or any other hurricane in a state of rest.

Frieda paid for her holiday "all round" at the rate of 20 dollars per week. She shared with three other women a large, sunny room of a seven-roomed house in a "village" – actually a holiday centre – of about a dozen logbuilt dwelling houses. The village had larger buildings to house the dining rooms, recreation rooms, concert hall, administrative office and so on. There were also tennis and volley-ball courts, open air dance-floors and a mile – wide lake for bathing, boating and fishing. For Frieda, an old countrywoman, the chief attraction was the adjoining pine forest although she admitted that she spent many hours a day simply wallowing in "shop talk" with her cronies. I don't doubt it.

There are several hundred of centres of that type within a hundred miles of the capital. They provide holiday facilities for hundreds of thousands of city-dwellers at a cost which I think can be fairly described as quite reasonable. But when you add to these holiday centres the many thousands of privately owned "dachas" (country cottages), and the rooms that are rented and the accommodation provided by country cousins, this area becomes the holiday ground not just for hundreds of thousands, but literally for millions of city-dwellers in the course of a summer.

"Hunting", "fishing", or "shooting" in England has about the same sound as "old school tie," here it has a completely democratic sound. It seems that every other person whom I ask, " How are you spending your holidays?" answers, "Hunting, of course," or "Fishing, of course."

Some of the anglers fish at weekends all the year round. This means that apart from their usual tackle they have at times to carry crow-bars to make holes in the ice. Fishing here costs you no more than the cost of your tackle. You can fish when and where you like and, with the natural close-season restrictions and so on, you can go out with dog and gun when and where you like: here it is physically impossible to "trespass in pursuit of game!" "Poaching" is a common word in English. The word "braconnier" is almost forgotten here – it applies only to breaches of a few rare game-preservation laws. The number of our people who go to health resorts is impressive. The hunting', fishing' holiday-markers number tens of millions; so do the young hikers and cyclists and "alpinists" who go to camp (the "camps" are usually permanent buildings) or on long excursions; so do the people like Frieda who go to organized centres; so do those who find their own accommodation in the country or come to visit with their village folk or come from the country to spend their holidays with their town cousins.

Exercise 5. Read the arguments and say if you are agree or disagree with them.

Of all things people probably hate diseases most. Suppose you plan to finish your work tomorrow. It's very important and urgent. Besides, you have given your word the work will be ended in time – and alas! In the morning you find out suddenly that you can't get up as usual. You have a splitting headache. You feel a little dizzy and you cough; you can't recognize your voice because your nose is clogged. Besides, it's hard for you to swallow. You fight back the thought you are ill. You look for the thermometer. At last the temperature is taken: 38.4. That means you are running a high temperature. So the last hope you're all right is destroyed. You are ill, that's certain. It can't be helped. You have to stay at home. You inform your mother of your illness. Now the doctor will be sent for. He'll be here in an hour or two. He'll take your hand and say, "Well, what troubles you, young man? Having a cough? I see you're sneezing... Well, let me feel your pulse... Now let's sound your lungs; please strip to the waist... Breathe, please." Then he will conclude, "Well, nothing serious, just a flu. But you'll have to keep your bed for a few days. Don't go out earlier or else you'll get complications... And here's the prescription. Take the pills regularly and keep yourself warm. Wish you good luck, old fellow!"

The doctor will leave. He's very busy, he has a lot to do. but you will stay in bed: you are ill.

Exercise 6. Compose your own sentences using the following substitution table.

You		go to see the doctor at once.
He		take this medicine for your (his, her, etc.) cough.
She	had better	keep the bed for a week.
They		take your (his, her, etc.) temperature.
We		read this book in the original.
		join our local library.

Give advice and suggest what each one should do. Follow the pattern.

P a t t e r n: I'm aching all over. – You had better go to see a doctor.

1. Ann's grandmother, who is 82, has got a bad attack of 'flu. 2. John's little brother has a very bad sore throat and a bad cough. 3. John has hurt his arm badly while playing volley-ball. He thinks he has broken it. 4.The doctor has given you a prescription. 5. You feel hot. 6. You feel quite run down. 7. Marry has a splitting headache. 8. You are in doubt how to take the medicine.

Exercise 7. Insert « but, except or besides».

1. He could do nothing ... call the doctor in. 2. The doctor examined all the students of our group ... Mary as she was ill that day and stayed at home. 3. What do you take for a cough? – I always take this mixture and of course I drink milk with butter and honey. .. . 4. ... the drops she has bought some powders at the chemist's. 5. The sick child wanted to see nobody ... her mother. 6. She could give him no other medicine ... powders for the cough. 7. The doctor didn't put her on a diet and allowed her to eat everything... eggs. 8. He had all children's diseases ... diphtheria in his childhood. 9. The doctor recommended me to do nothing ... keep my bed for a couple of days. 10. I had nothing else to do... go to the chemist's and buy a new thermometer instead of the broken one.

Exercise 8. Supply the given verbs in the necessary form.

а) *to see*, *to look* (*at*)

1. "We shall have to operate on that leg, Mrs Walsh." "When?" I asked, not daring ... Mo-Mo. 2."Don't worry, mother," she said. "I'm all right now. Don't you... I'm much better already?" 3. Bart noticed a great change in Jan since he... her on Sunday. 4. She lay back and ... him with frightened eyes. 5. They took their temperatures in silence. No one... openly at her neighbour, or at the woman in the bed directly opposite. No one wanted the other ... the question in her eyes. 6. The little boy tried ... his tongue. He stuck it out, and shut one eye, and tried to examine it with the other, but he could only ... the tip.

б) *to stay*, *to remain*, *to leave*

1. The doctor told me my little darling would ... in hospital until she recovered. 2. When she ... the hospital you had better take her to the sea-coast and... there for a week or two. 3. Please ... here till I return. I can't ... my sick daughter alone. 4. I've been invited to go and ... with some friends of mine in their cottage . We ... in a day or two. 5. I could not break the news of his father's death to him. The letter his mother had written ... in my drawer all day. I gave it to him only in the evening when we were alone.

Exercise 9. Fill in the blanks with «else, more, still, another, other, yet».

1. What ... medicine did the doctor prescribe? Who ... wants to go to a sanatorium? 3. She will stay at the sanatorium several days ... . 4. Will anybody ... call on Peter in the evening? 5. Isn't the medicine ready...? 6. I don't think he is ... in hospital. 7. What ... did the doctor tell you? 8. I shall drink... glass of tea. I'm ... thirsty. 9. What ... remedies do you take for a headache? 10. I think that he will ... be keeping to his room on Monday. 11. The doctor did not allow her to go out ... . 12. We hope that some ... doctors will take part in the discussion. 13. The doctor was sure that ... week in the country would do him a world of good. 14. I have not taken the pills … . 15. Who … can examine the patient?

Exercise 10. Insert prepositions or post-verbal adverbs where necessary.

1. Take these tablets ... your cough, to be... the safe side. Otherwise you may fall ill ...'flu. It's strange that you can't get rid ... it ... such a long time. 2. He is ill ... quinsy … a very severe form. He has been keeping... his bed ... a fortnight already and is sure to stay... bed ... another week. 3. The doctor gave him a sick-note because he has a very serious complication... his heart ...quinsy. 4. As you are subject … colds you must start hardening yourself. It is the best remedy... it.5. I see you are constantly suffering … your liver. 6. Many people died either ... starvation or ... wounds … the blockade … Leningrad. 7. If you complain ... an earache, go and have this prescription made up ... the chemist's. 8. I feel I'm aching all … and running a temperature. I think we must call ... a doctor. 9. If you don't want to put ... weight, stop eating so much bread and pastry. Cut it... to the minimum. 10. Well, Julian, your temperature isn't much above normal. Nothing to worry ..., but I think you had better go... bed at once. A little rest will do you a world … good. You've been overdoing things lately, and if it is a touch of 'flu, it may develop ... something serious. Off to bed then, and I'll make you a hot drink.

Exercise 11. Learn the dialogue and dramatize it in class.

A Touch of 'Flu Mrs B.: What's the matter, Ellen, a headache?

Ellen: Yes, rather. I've been feeling poorly ... two days now, and I woke ... ... a sore throat this morning.

Mike: Shall I fetch you a couple ... aspirins?

Ellen: No, thank you. I've been taking aspirin all the time and it doesn't help me much.

Mr. B.: As a matter of fact I'm feeling rather run ... myself. Perhaps we've got a touch ... 'flu. It generally begins ... a headache and a sore throat.

Mrs B.: I'm afraid that's what it is.

Mike: No wonder, with so much 'flu about.

Mrs B.: Exactly. Well, the first thing to do is to take your temperature. Mike, fetch a thermometer, will you?

Mike: Certainly, Mum, it's ... the medical chest (аптечка), isn't it?

Mrs B.: Probably, but if it isn't there look... it... my top right hand drawer.

Mike: All right.

Ellen: Mummy, I think I'd better go ... my room and lie ... . I'm afraid I don't feel well at all.

Mrs B.: Poor dear, of course. Off ... bed with you and I'll come ... you presently.

Exercise 12. Read the text «Our first surgeon» and give the main idea of it.

Have you read the story by Alexander Kuprin "The Wonderful Doctor"? Do you happen to know it's about Nikolai Pirogov, a great researcher, excellent surgeon and clinician? He was not an ordinary man. At 18, he graduated from Moscow University; at 22 he became a Doctor of Science; at 26 he was a Professor at Derpt (Tartu) University; one of the largest in Europe at that time; at 30 he headed Russia's first surgery clinic. During his 30 or so years in surgery he started a new trend in the study of human anatomy and physiology, based on new methods. To this day Pirogov's methods are among the basic methods in the study and teaching anatomy. Nikolay Pirogov was the first man in the world to proclaim disease prevention an extremely important task of medicine. "The future," he wrote "belongs to preventive medicine." Today nobody doubts it. If you happen to be in Pirogovskaya Street stop and look at the monument to this great man. It was the first ever memorial to a scientist in Russia that was opened on August 3, 1897. Nikolai Pirogov was called a scientist of genius even in his lifetime.

Exercise 13. Supply «ill» or «sick».

1. It goes without saying that healthy men are happier than ... men. 2. When I'm ... I stay in bed. 3. The meat was bad, and made everybody... . 4. He went to the hospital to visit a friend of his. 5. When I travel by boat I always become... . 6. I've been very..., but I'm much better now. 7. He felt ... and left in the middle of the game. 6. It was just …fortune. 7. As … luck would have it. 8. Don't wish them … . 9. He is … able to sustain the burden. 10. I am sorry I didn't come to your birthday party. I was … with the flu.

Exercise 14. Use the adjective «dead» or the verb «to die» in the suitable form.

1. His grandfather is ... . He ... many years ago. 2. He ... of fever. 3. A ... bird is lying in the cage. 4. The flowers... . What a pity! 5. People seldom ... of pneumonia nowadays. 6. The past is ... . 7. The soldier ... from his wounds. 8. If there's danger, the animal will sham … . 9. The doctor pronounced him … on arrival at the hospital. 10. Pale and unconscious, he looked more … than alive.

Exercise 15. Insert English equivalents of the words in the brackets.

1. What is the trouble? – I have a (боль) in my chest and rather a bad cough that I can't (избавиться). Are you doing anything for it? – I just drink hot milk with honey (мед). It is (лучшее средство) for it. 2. The doctor (осмотрел) the patient. He (пощупал) his pulse and (прослушал) his heart and chest. He (прописал) him some medicine to be taken before meals. 3. The doctor was sure that a month's rest in the mountains would (принесет) my brother (огромную пользу). And indeed when he returned from the sanatorium he felt (в добром здравии и хорошем настроении). 4. When she (заболела) pneumonia last year she had to (пролежать в постели) for over three weeks. 5. You (очень простудилась). You must (полежать в постели) and in a day or two you will recover. 6. You (поправилась). What do you weigh now? 7. Why is she looking so (плохо) today? – Is she? I thought she was looking only (усталой). 8. I'm sure you feel (здоровым) after your two months' rest. – Indeed. I feel very (хорошо) now. 9. To say that I am feeling (неважно) is to say nothing. I'm feeling (плохо) and dead (усталой). 10. You're looking (больным) today. What's the matter with you?

Exercise 16. Translate sentences into English.

1. У него болит горло. Наверное, у него ангина. Измерь ему температуру. - Где градусник? – Где-то на столе. 2. Не купите ли вы для меня лекарство в аптеке? – С удовольствием. Где рецепт? – Вот он. 3. Хотя мне и нездоровится, я не стану принимать лекарство, так как терпеть не могу (can't stand) всякие порошки, капли, микстуры. Я просто не буду выходить на улицу несколько дней. 4. Катя серьезно больна. Она лежит в больнице уже месяц. Но сейчас ей значительно лучше. Я надеюсь, что она поправится к своему дню рождения. 5. Что с вами? Вы похудели. – Ничего серьезного, я просто устал. Я много работаю и мало сплю. Через неделю я поеду в санаторий и отдохну. Это как раз то, что вам нужно. Я уверен, что месяц отдыха принесет вам большую пользу, и вы будете снова прекрасно себя чувствовать. 6. Все, кроме Нины, остались на вечере, а она должна была вернуться домой, так как она оставила больную мать одну дома. 7. Ты неважно выглядишь сегодня. Что с тобой? Ты плохо спал? – Я себя плохо чувствую уже несколько дней. У меня нет аппетита, и я плохо сплю. Пойди к врачу. Он тебе даст бюллетень и лекарство. – Но у меня нет температуры, только насморк и головная боль. 8. Вам придется пройти тщательный осмотр. 9. Дети часто температурят. Я это знаю, но когда я увидела, что у дочери 39,5 , я сразу бросилась к врачу, который всегда ее лечит. Оказалось, ничего серьезного. Врач посоветовал мне подержать ее в постели денек – другой на всякий случай. 10. Что ты так плохо выглядишь сегодня? – Не знаю, меня всего ломает, и у меня насморк. Боюсь, что заболеваю гриппом. 11. Ей сегодня так же плохо? – Нет, температура спала (to fall down), и ее больше не лихорадит. – А когда вы измеряли ей температуру последний раз? – Часа полтора тому назад. – Дайте-ка я пощупаю пульс и послушаю легкие. 12. Никакое лекарство не может сотворить чудо, если его нерегулярно принимать. Совсем неумно с твоей стороны, что ты пренебрегаешь советами врача. 13. Мой ревматизм – осложнение после скарлатины. Я страдаю от него уже лет семь. 14. Давайте измерим ваше давление. 15. Тебе бы лучше больше обращать внимание на свое здоровье, да поменьше курить. 16. Вот тебе порошки. – Спасибо, это как раз то, что мне нужно. 17. Лена опять простудилась! Когда она начнет закаляться? Неужели ей нравится так часто болеть? 18. Она жалуется на зубную боль уже месяц, а к зубному врачу не идет. 19. Какое лучшее средство от насморка? 20. Кто разбил градусник? – Я. – Опять? Тебе ничего не остается сделать, как пойти в аптеку и купить новый. 21. Кроме этих порошков я ничего не принимала.

Exercise 17. Learning the expressions given below tell about medical service in our country.

Medical service is free of charge, a wide network of medical establishments, to take a course of treatment, to take care of mother and child, maternity leave, to eliminate diseases.

Exercise 18. Translate the sentences into English.

1. Она серьезно больна. Ее положили в больницу. Возможно, ей предстоит операция. 2. Вам надо измерить температуру. Вот термометр. Стряхните его (shake it off) и поставьте под мышку. 3. Я вам советую обратиться к врачу и чем скорее, тем лучше. У вас больной вид. 4. Если бы диагноз был тогда установлен, больного немедленно отправили бы в больницу. 5. Я был ранен в ногу во время войны, и сейчас долгая ходьба вызывает у меня боль. 6. У меня сильная боль в правом боку (в колене, в левом ухе, в обоих глазах, в грудной клетке, в груди). У меня болит глаз (болит рука, нога, горло). 7. У вас высокая температура. Вам нужен постельный режим в течение двух-трех дней. 8. Оксана больна воспалением легких (скарлатиной, ангиной, гриппом). 9. Его лечили от гриппа, но у него оказалось воспаление легких. 10. Это очень хорошее лекарство от головной боли (от ушной боли, зубной боли). 11. На юге США десятки тысяч негров страдают от туберкулеза. Они не получают необходимого лечения. Смертность среди негров, больных туберкулезом, чрезвычайно высока. 12. Болезнь эта пока неизлечима. Известны методы лечения, сохраняющие жизнь на много лет ; но они пока не дают полного излечения.13. Осложнения после этой болезни хуже, чем сама болезнь. 14. Повара, официантки, няни в детских садах и яслях и т.п. раз в месяц проходят медицинский осмотр. 15. Все дети до поступления в школу должны пройти серьезный, тщательный медицинский осмотр. 16. Родители детей, уезжающих в летние лагеря, должны представить справку (certificate) о том, что в семье и доме нет инфекционных заболеваний. 17. Вам нужно пройти рентген и сделать все необходимые анализы. 18. У больного опухли суставы (joints) и выступила сыпь (rash broke out), воспалены глаза и горло. 19. У него больное сердце. Вчера у него был сильный (bad) сердечный приступ. Он в постели. Врач запретил ему вставать в течение трех дней. 20. У Марии Михайловны неприятности с почками (с сердцем, с желудком, с легкими). 21. Эти пилюли от кашля, капли (drops) от насморка, мазь (ointment) от зуда кожи (itch). 22. Доктор выписал мне рецепт и сказал, что лекарство мне приготовят в любой аптеке. 23. Она была очень больна, лежала без сознания в течение двух дней. Сейчас ей лучше. Завтра я пойду навестить ее. Я не знаю, разрешат ли мне передать ей цветы и фрукты. 24. Пенициллин – прекрасное средство борьбы с воспалительными процессами. 25. Усилиями врачей малярия одно из самых распространенных заболеваний в прошлом – сведена на нет. 26. Он выздоровел (оправился) от тифа и сейчас совершенно здоров. 27. Меня слегка тошнит. У меня легкий озноб, болит все тело, кружится голова. Я больна. 28. Самое лучшее средство от простуды – утренняя зарядка, обтирание холодной водой, регулярные прогулки на лыжах, посещение катка.

Exercise 19. Analyze the text «Some invisible factors composing the body» and do the tasks.

The body consists of organs. They are composed of tissues, and the tissues are made of cells; too small to be seen. There are 60 billion of them, some living a few days, others many days, and some a whole lifetime. Millions are being manufactured and millions being destroyed every second. Surrounding the cell is a membrane, three ten-millionths of an inch thick. There are about 10,000 million cells in the brain, and 10,000 neurones. The more information the brain receives, the denser it becomes, until old age; when the cells fail to reproduce. As a result the elderly may not be able to remember recent events and information; thus they become very suspicious and may make false accusations. There are 60,000 miles of blood vessels and capillaries in the body. There are 2,500,000 filters in the kidneys, they allow 2 pints of fluid to pass through every minute. During a lifetime 8,000 gallons of urine passes through the bladder. There are 300 million air sacs or alveoli in the lungs. 200,000 ova are present in the ovary. 2-5 million sperms are released at one time. They carry the code indicating the sex. There are 130 million rods and cones in the eye. 2,000 pores per square inch are present on the fingertips. There are 600 muscles, and 206 bones, half of them being in the hands and feet.

DIALOGUE «AT THE DENTIST'S»

- I'm very sorry, Doctor. I'm afraid I'm a little late for my appointment.
- It's all right. The last patient left just a moment ago.
- It's so difficult to judge the time these days. I left home more than a hour ago, but the traffic is so heavy.
- What seems to be the trouble? Sit down, won't you?
- (Mrs. Moore, sitting down in dentist's chair) I have a filling which is loose and is about to drop out. I also have a soreness on the side of my mouth. I don't know whether it is from one of my teeth or whether it's a little neuralgia.
- Let me take a look at it. Open your mouth wide, please. On which side of your mouth did you say it hurts you?
- Ouch! Ouch! (Mrs. Moore begins to wave her arms violently in evidence of being in great pain.)
- But, Mrs. Moore, I haven't even touched you yet.
- I know, Doctor (with a sign of relief) - but I am so afraid of a dentist, that I feel pain even before you touch me.
- I'm sorry you feel this way, but let's see what the trouble is.
- It's on the left side - just above my eye tooth. The pain seems to skip around - sometimes it is in one place and sometimes in another.
- Does the tooth itself ever ache or become sore to touch? Is it sensitive to heat or cold?
- No, only the gum above the tooth seems to get sore.
- The teeth in that area seem to be sound. It may be a little neuralgia, as you say - but we'd better take an X-ray just to be sure none of the teeth is abscessed. Do you mind moving over here, Mrs. Moore, to the X-ray machine? (Mrs. Moore takes a seat at the X-ray machine. Dr. Kane adjusts the machine, takes the picture, etc. Mrs. Moore returns to the dentist's chair.)
- Now, let's see that loose filling. It's surprising it didn't fall out. There's a good deal of decay around it. There is also a slight cavity on the other side of the tooth which you probably didn't know you had.
- Oh, dear. I do hope you won't have to pull the tooth.
- I don't think so. It's not quite as serious as that. But it may take considerable drilling. I'll have to give you an injection of novocaine. The decay has gone deeply into the tooth. I'd also suggest, from the size and form of the cavity, that we put in a gold, rather than another silver filling. I doubt whether a silver filling would hold for very long.
- What is the difference between a silver filling and a gold filling?
- About twenty dollars in price, for one thing. The gold filling also lasts longer. With a gold filling we first take an impression, and the filling is then made to conform to this impression. We can reproduce exactly the form of the original tooth.
- I suppose it's all right, but I don't know what my husband will say about the cost. One's teeth are such a problem, aren't they? I dread coming to see you - but of course I mean nothing personal, Dr. Kane.
- I understand. Now open your mouth wide, please. (Mrs. Moore opens mouth wide) Wider please! A little wider. (Dr. Kane proceeds to put several pieces of cotton into Mrs. Moore's mouth, a small tube to extract the saliva, part of a towel, a tongue depressor, etc.) Wider, please. By the way, Mrs. Moore, how is your husband feeling these days?
- Ugh! Ugh!

Exercise 1. Learn the dialogue by heart. Render the contents of the dialogue in Indirect Speech in English.

DIALOGUE «A VISIT TO THE DENTIST»

TEACHER: A visit to the dentist is almost always a little unpleasant. But if you have a pain in your tooth you have to go to the dentist immediately. Now I'll ask Mike and Bob to be the dentist and the patient. This is the dentist's waiting room.

MIKE: I'm ready to play the part of the dentist, but not of the patient.

BOB: Well, I'd like to be the dentist too, but it's Mike's turn first. I'll have to be the patient this time.

TEACHER: Will you begin, please? Here are your white overalls Mike, and this is the dentist's chair for you, Bob.

(*Bob sits in the chair. Mike comes up to Bob*.)

MIKE: Hello, what can I do for you?

BOB: It's my tooth. It hurts.

MIKE: Well, let's see what we can do about that. Open your mouth, please. Wider, if you can. Yes, that's good. Thank you. You may close your mouth for a while. How long has your tooth been bothering you?

BOB: For about a week.

MIKE: And you tried to ease your pain by smoking, didn't you?

You see, I can smell it. When one doesn't smoke...

BOB: I'm sorry.

MIKE: How many cigarettes do you smoke a day?

BOB: About 20.

MIKE: That's rather a lot. You're ruining your health. And has this other tooth been giving you any trouble?

BOB: Not much.

MIKE: Do you know whether it has ever been filled.

BOB: I don't remember that.

MIKE: Well, we'll soon find it out. I'll take an X-ray. Would you prefer me to put a crown on it or to pull the tooth out?

BOB: Oh, I most certainly don't want it to be pulled out.

MIKE: Well, if I did that, you could have a false tooth on a plate, or a bridge to fill the gap.

BOB: At my age, I'd rather have no false teeth yet. And a bridge? What's that?

Mike: Don't be afraid. You wouldn't have to keep on taking it out and putting it in...

BOB: Like my grandmother, you mean. She always does it. I would much prefer having a crown.

MIKE: I think you're wise, but I must warn you that I can only put a crown on if the roots of the tooth are all right. Will you wait here a moment? I must go to the next room for some more instruments in case you have a tooth or teeth that I'll have to pull out. (Mike goes out.)

BOB: Well, well. Pulling out teeth, bridges, a false tooth, a crown, the drilling machine... No, no, I can't stand all that. I think now is just the right time for me to leave the dentist's surgery while he is away. (Bob goes out. Mike returns.)

MIKE: Well, I'm ready for any urgent operation. I've got here all sorts of necessary instruments... Where is my patient? He's gone! I wonder what made him run away. I didn't want to frighten him... He's simply a coward, that's what he is! Well, sooner or later he'll have to come back. He's sure to have another attack of toothache pretty soon. Patients don't like visiting dentists, but they can't do without us! (Mike says to the Teacher) That's the end of our sketch, isn't it?

TEACHER: Yes, thank you very much, boys. With your help we've talked today about dentists, teeth and their treatment. And that's a very important part of our daily life.

Exercise 1. Learn the dialogue by heart. Render it in Indirect Speech in English.

Exercise 2. Transfer the given information from the passages onto a table.

№	Factors			
	Name	**Where**	**How many**	**Score**
1.				

Exercise 3. Learn the dialogue by heart. Render it in Indirect Speech in English.

Mary had a terrible toothache, she could neither eat nor sleep for two days. At last she decided to go to the dentist's surgery and have her tooth extracted. When she got to the waiting room, she was met by the nurse.

NURSE: Have you an appointment?

MARY: No, I haven't, but the tooth pains me very much.

NURSE: The doctor is engaged just at present. Will you take a seat and wait a while, I'll call for you in a few minutes.

DENTIST: What is troubling you?

MARY: Oh, doctor, one of my back teeth troubles me very much, do pull it out!

DENTIST: Just a minute, let me examine your teeth. Look here, this front tooth is working loose, and here is a cavity, which wants filling. Has this back tooth given you much trouble lately?

MARY: Oh, yes, it has.

DENTIST: It's a pity you didn't have it looked after earlier. Now nothing can be done, we'll have to have it out.

MARY: Do have it out! And the sooner the better.

DENTIST: Will you have anaesthetic?

MARY: If you find it necessary. I would rather not, if you can get it out quickly.

DENTIST: We'll see. (He made a sign to the nurse for the necessary instruments.) Take this glass and rinse your mouth.

MARY: Is that water?

DENTIST: No, it isn't. It is a special mouthwash containing an antiseptic. Now sit comfortably and open your mouth wider. Well, here you are. Did it pain you very much?

MARY: Not particularly. I feel just a dull ache now.

DENTIST: That will soon pass off, I expect. Now you may go home. Be sure to come again in a few days. Remember that one of your teeth needs filling.

MARY: Thank you, doctor. I'll come for sure, only I am so very much afraid of the drilling machine.

DENTIST: Don't be. I'll do it as gently as I can. Good-bye for the present.

MARY: Good-bye, doctor, and thank you very much.

Exercise 4. Answer the questions.

1. Why is Mrs.Moore late for her appointment? 2. Why does Mrs. Moore suddenly begin to yell "Ouch" and to wave her arms even before Dr. Kane touches her? 3. Why does Dr. Kane think it advisable to take an X-ray of Mrs. Moore tooth? 4. Have you ever had an X-ray taken of your teeth? 5. How much do dentists generally charge to take an X-ray?6. Is it painful or painless to have an X-ray taken?7. Is it painful or painless to have an injection of novocaine? 8. Do you mind greatly having a tooth pulled? 8. have you ever visited a dentist? 9. How did you fill there? 10. Can you describe you feeling after the examinations of a dentist?

Exercise 5. Analyze the information, which is in the highlight, and use it in practice.

Exercise 6. Make up some dialogues from the information above.

Exercise 7. Write all new words and phrases on the topic.

MIND & BODY

Just think of it ... five-and-a-half billion unique combinations of colour, age, nationality, language, height, weight, beliefs, dreams and fears. Amazing, isn't it? Yet despite our differences, in one very important way we're exactly the same. How? Well, from Tokyo to Timbuktu and Paris to Peking, what everyone basically consists of is (1) a mind, (2) a body. Here are some fascinating facts about the way our minds and bodies are made.

There are over 50 billion cells in every adult human being. Millions of these die every second, but that's not a problem because new cells quickly replace them. How do cells reproduce? By splitting in two. Another interesting fact is that different types of cell last for different lengths of time — e.g. red blood cells last an average of four months, but bone cells can last for as long as 30 years.

The average temperature of the human body is 36,5°C. The brain has two halves or 'hemispheres'. The left hemisphere controls the right side of the body and is generally more powerful than the right hemisphere. That's why 91 % of people are right-handed.

If you laid all the intestines in a human body end to end, they would measure over ten metres. We blink roughly fifteen times per minute to clean our eyes and stop them getting dry.

The average human being produces over three litres of tears per year. (Elephants are the only other animals, apart from human beings, which cry when they feel very sad or happy.) 8% of men and five % of women are colour blind. This means that they can't tell the difference between one colour and another. The commonest colours which people have problems with are red and green.

No two human beings have exactly the same fingerprints. The thickness of skin varies. On your eyelids it's only 0,5 millimetres thick, but on the soles of your feet it's 6 mm thick. The average thickness on most parts of your body is 2 mm. Old skin cells are constantly replaced by new ones (that's why suntans gradually fade after holidays). And what happens to old skin cells? Well, they simply drop off; in fact, most house-dust is simply dead skin. The total length of all the blood vessels (arteries veins, etc.) in one body is 96,560 kilometres. That's enough to go around the world twice.

There are four main types or 'groups' of blood – "A", "B", "AB" and "O".

The commonest type is "O". A human heart beats roughly 100,000 times per day, sending blood on its journey around the body. The average time it takes to complete that journey is 45 seconds. Each of us has 206 bones. Collectively they're called the skeleton. There are more than 600 muscles in your body, over 100 of which are in your face. Human beings are two-thirds water.

Exercise 1. Translate the dialogues into English.

- Ты неважно (плохо) выглядишь сегодня утром. Что с тобой? Ты плохо спал.
- Я себя плохо чувствую. Наверное, ничего серьезного.
- Я бы на твоем месте обратился к врачу.
- У меня насморк и головная боль. Пройдет!
- До занятий ты успеешь зайти в нашу поликлинику. Экзамены через 10 дней. Рисковать не надо.
- Пожалуй, ты прав. Я пойду к врачу.

Николая Петровича сегодня нет.

- Что с ним?
- У него сильный насморк, головные боли и кашель. Ему дали освобождение на 3 дня.

- Что Вас беспокоит,
- У меня температура, болит, горло кашель.
- Откройте рот. Давайте я вас послушаю. Легкие чистые. Я выпишу Вам таблетки.
- Как нужно их принимать?
- Три раза в день после еды.

HOLE IN THE HEAD

In 1962, a Peruvian brain surgeon, Dr. Francisco Grana, removed a paralyzing blood clot from beneath the skull of one of his patients. In opening the skull, he employed only stone instruments used by ancient Peruvian physicians. His patient survived the operation and recovered.

Thus Dr. Grana proved what many had known but scarcely believed – that physicians of ancient Peru were able to perform trepanation – or operations in which the skull was opened.

Hundreds of ancient Peruvian skulls have been discovered with regularly cut holes. More than half of these skulls have shown signs of regrowth, indicating that the patient survived the operation.

Jurgen Thorwald tells this story in his book Science and Secrets of Early Medicine. He discusses medicine in the ancient societies of six countries: Egypt, Babylonia, India, China, Mexico and Peru. In our European-centered culture, we like to think that medicine started with the Greeks, and before that all was darkness. Thorwald destroys this notion. The Greeks must have learned much from earlier societies. The Egyptians used primitive forms of antibiotics, the Babylonians had operations for cataract of the eyes, the Indians knew of skin transplants and plastic surgery.

An examination of mummies shows that hardening of the arteries was very common among the upper classes in Ancient Egypt, even among the young. One of the reasons for this is that despite the idealized slim portraits that have come down to us, many upper-class Egyptians were probably quite fat from overindulgence in the pleasures of the table.

Medical researchers have also found physiological evidence to indicate that many of them also suffered from extreme nervous tension. "Intrigues, struggles for power, wars, religious disputes and internal dissension, attempts at poisoning and assassination and their own craving for excitement, must have caused a considerable part of the Egyptian tipper class to lead a nerve-wracking life," Thorwald comments. It's fair to conclude that nothing among our cures, diseases or even our tensions is exclusively a product of modern life. The most important part of the nervous system of a human being, is what may be called the new brain. It is so large, and has grown out so far. in all directions, that the whole part of the old nervous system is under it.

Ordinarily when we talk about a man's brain it is entirely of this new brain that we are thinking.

The proper name for it is cerebrum. The first glance at the cerebrum shows that it is a double organ. It has a right half and a left half. These two are alike, though it seems that in right-handed people the left half, and in left-handed people the right half is slightly larger.

If we separate slightly the two halves of the cerebrum and look down between them, we see a mass of white nervous tissue running across from one side to the other. This is a bridge between the two halves of the brain by which they are made to work and act as one. When we look at the surface of the brain we see at once that it is very much folded. The folds vary in depth and length but on the whole they form a definite pattern which is the same on both sides of the brain, and its main lines are the same in all human beings. The surface of the brain is the all-important part.

The brain in the animal world increased until it has reached the size it is in the human head.

This means that there has been a great deal of room required to house the brain. Therefore the skull has also become bigger. But the brain has grown more quickly than the skull, and the surface has been deeply tucked away here and there.

There is as much or perhaps, more, of the surface of the brain tucked away than shows on the outside. The higher the type of brain, the more its surface is folded. As animals have become more and more intelligent, the surface of the brain has become more folded. When we cut through the cerebrum of any of the higher animals, we find that it consists of an outside layer which is grey and an inside layer which is white. This grey layer is often called the mantle. It is the real brain, and it is the most wonderful thing of which we have any knowledge. It owes its grey colour and all its meaning and wonder to the fact that it is principally made up not of nerve-fibres, but of nerve-cells. The rest of the brain is made up of nerve-fibres or nerves which give the inner layer a white colour.

The grey mantle contains comparatively few nerve-fibres which connect its different parts.

Several layers of cells are found in any part of the grey mantle. The cells differ in different parts of the brain. When examined, corresponding parts of the brain in a large number of animals of quite different kinds show the same arrangement of cells. If a microscope slide containing a large number of cells shaped liked pyramids and arranged in a certain way were shown to an expert.

He would recognize them as belonging to that part of the brain which controls the movements of muscles, though he might not be able to state what kind of animal it was taken from.

The whole of the surface of the brain has been mapped out. In the brain we find centres for the motion of muscles, for feeling, sight, hearing, taste, smell, etc. In the lower kind of animals, the whole brain practically consists of these various centres. They make the brain. But as the brain gets bigger it is not the centres that get bigger, but they become gradually separated from one another by the growth of new parts of the brain between the old centres. The process goes on and on, until at last in mankind and only in mankind – it has reached the stage at which various special centres have become mere patches that lie here and there on the surface of man's huge brain. These newer areas often called the silent areas play a very important part in the functioning of the brain. The nerve-fibres from them run in every direction. They run in definite groups and by definite ways to the other centres of the brain. They are the associate fibres. They associate one part of the brain with another. If we compare the spinal cord of a dog with that of a man, there is not much difference between them.

If we compare the cerebrum of a dog with that of a man, we find that the difference consists mainly in association of fibres and cells. The grey mantle in the case of a man is much thicker. It is the greater number of association cells that makes it thicker. Generally we may say that the difference between a high brain and a low brain is: that in the special centres the grey mantle is thicker in the high brain because there are a great many association cells in it, and that in the high brain the special centres are forced apart by the growth between them of new parts of the brain which bring all parts of the brain into connection with one another. The human brain is the highest product of matter.

Exercise 1. Choose the keywords and phrases that best convey the gist of the information.

Exercise 2. Answer the questions.

1. What did a Peruvian brain surgeon, Dr. Francisco Grana in 1962? 2. What did he prove? 3. What did hundreds of ancient Peruvian skulls show? 4. What did medicine start with in our European-centered culture? 5. What did the Egyptians used? 6. What have medical researchers found? 7. What is the most important part of the nervous system of a human being? 8.What is the construction of a brain? 9. How can contemporary problem of a brain be resolved? 10. How can you characterize mental capacities?

Exercise 3. Translate the sentences into English with the help of the text.

1. Мы имеем в виду именно новый мозг. 2. Мы видим массу нервных волокон, связывающих их. 3. Они обеспечивают взаимодействие их как единого целого. 4. Это значит, что мозгу требовалось много места. 5. Возможно, что в складках серого вещества мозга больше, чем снаружи. 6. Его серый цвет и удивительные возможности объясняются определенными аспектами. 7. При исследовании соответствующих участков мозга у большинства различных видов животных наблюдается одинаковое расположение клеток. 8. Он и не сумел бы, возможно, указать вид животного, у которого был взят мозг. 9. Они составляют мозг. 10. Они стали просто отдельными островками, расположенными на разных участках огромного мозга. 11. Если сравнить спинной мозг собаки и человека, то можно сделать определенные выводы. 12. Более плотным делают его соединительные ткани. 13. Кроме этих порошков я еще пила какую-то горькую (bitter) микстуру. 14. Он обещал достать это лекарство, да так и не достал. 15. Кто еще заболел? – Больше никто. 16. Я подвержена простудам и часто болею гриппом. 17. Кто вас лечит? – Доктор Воронов. 18. Легко заболеть, да трудно выздороветь. – Не пугай меня. Я верю в медицину.

TOPICAL VOCABULARY

brain – мозг *Syn. cerebrum* on one's brains – в мыслях, на уме

умственные способности, интеллект, разум; рассудок, ум.

The power of thinking depends upon the brain. – Мыслительная способность зависит от головного мозга.

disease of the brain – болезнь мозга

to be in one's right brains – быть в здравом уме

out of one's brains – помешанный, не в своём уме

to live with one's own brains – жить своим умом

the great brains of the world – великие умы человечества

(разг.) "голова", умница, мыслящая личность

brain drainer – ученый, специалист, эмигрировавший в другую страну

brain drain – " утечка мозгов" (массовая эмиграция научных работников)

to beat (puzzle, rack) one's brains about (with) smth. – ломать себе голову над чем-н.

to crack one's brain(s) – спятить, свихнуться

to have one's brains on ice (разг.). – сохранять ледяное спокойствие

smth. on the brain – неотвязная мысль

to have (got) smb., smth. on the brain – неотступно думать о ком-л. / чём-л.

An idle brain is the devil's workshop. – посл. Праздность ума - мать всех пороков.

to make smb.'s brain reel – поразить кого-л.

to pick (suck) smb.'s brains – использовать чужие мысли

to turn smb.'s brain – вскружить кому-л. голову; сбить кого-л. с толку

brain contusion – контузия головного мозга brain damage – мозговая травма

brain dead – дурной *Syn.* foolish, silly brain death – деанимация, смерть мозга

brain dump – (сленг) "мозковий дамп", "разгрузка мозга" (выдача собеседнику по конкретной теме полной информации, которой только владеет "рассказчик")

brain injury – травма головного мозга braino – ментальная ошибка, заскок

Brain Trust – "мозковой трест" (совещательный орган при президенте США, который создавался в трудные периоды и состоял из крупных общественных деятелей, банкиров, монополистов)

brain truster – сотрудник "мозгового треста"

brain wave – счасливая мысль, блестящая идея

brain work – иінтелектуальная работа

brain-child – замысел, идея; изобретение; плод (чьих-л.) размышлений, умственных усилий *Syn. invention*

brain-fag – энцефалопатия (заболевания головного мозга с невоспалительными его поражениями)

brain-picking – сбор или получение информации

brain-power – научные кадры; научно-техничная интелигенция

brain-storm – бредовая мисль; великолепная идея

brain-teaser (brain-twister) – проблема

brain-washing – "промывание мозгов" ((идеологическая обработка или психологическая и моральная обработка с целью побудить лицо к сообщению секретных данных или к подписанию ложных показаний)

skull – череп *Syn.* cranium base of the skull – основание черепа

skull cap – скальп fracture of the skull – трещина в черепе

to split smb.'s skull – раскроить кому-л. череп

He cracked his skull in the accident. – Он повредил череп в автокатастрофе.

trepanation of the skull – трепанация черепа

thick skull – тупая башка; медный лоб, тупость

fibre – 1) волокно, волоконце (о тканях организма человека) – nerve fibre

2) сила духа, стойкость (о характере человека) *Syn. strength, fortitude*

moral fibre – моральна стойкость

the very fibre of a person's being – сама сущность человеческого существования

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

Exercise 2. Remember idioms and slangs.

to beat (busy, cudgel, drag, puzzle, rack, ransack) one's brains (out) about (with) smth. – ломать себе голову над чем-л.

to use one's wits (loaf, brains), to put on one's thinking-cap - шевелить

to lash out at smb., to settle smb.'s hash - давать по мозгам

to get it good, to catch it in neck - получать по мозгам

to set smb. straight / right, to bring smb. to his senses - вправлять мозги

to try to brainwash / sway smb. - давить на мозги

to get on smb.'s back / case - капать на мозги

birdbrain, pinhead - куриные / цеплячьы мозги

smb.'s head is on backward, to be a crackpot - мозги накособочы

to rake smb. over coals, to take smb. to task - промывать, прочищать мозги

to bullshit smb., to throw dust in smb, "s eyes - пудрить мозги

to (very) marrow one's bones - до мозга костей.

Exercise 3. Read the text and answer the question: How do you catch a cold?

Your body aches. You can't breathe. Your head feels as if it might explode. There's no denying it: You've got a cold. Winter is prime time for catching colds. Getting over a cold takes about a week. Luckily, there are steps you can take to keep from getting sick. So how do you catch a cold?

Believe it or not, says Dr. Joel Steinberg, a pediatrician, it's not caused by being cold, having wet feet or going outside with a wet head. Colds are caused by viruses, tiny germs too small to be seen by microscopes. Sneezing is one way cold viruses are spread. Air blasts out of your nose at about 100 miles an hour, producing thousands of airborne drops that land everywhere. If your hands touch anything those virus-infected drops land on, even doorknobs and pencils, watch out! Your hands can then ship those germs into your body through your mouth, nose or eyes. It's easy to catch germs. But there are some things you can do to protect yourself – and other people:

- Wash your hands frequently with soap & warm water to get rid of any germs you may pick up.
- Don't share drink glasses, even if you friend doesn't look sick. Cold symptoms sometimes take days to show up.
- Use a tissue when you sneeze, and be sure to throw it away. If you don't have a tissue, sneeze into your shoulder, not your hand.
- Eat lots of fruits and vegetables. This will keep your body strong and able to fight off any invading germs.

But sometimes, no matter what you do, you still catch a cold. Viruses are weird. Medicine won't make them go away; the only thing that will is time. You can help your body fight the virus by getting plenty of rest. Use your energy to get better. Another energy-booster is drinking lots of water and juice.

This prevents your body from becoming dehydrated, which makes you even more tired. If the symptoms get worse after three or four days, your illness may be more than a cold – see a doctor.

Exercise 4. Make up some dialogues from the information above.

Exercise 5. Write a small essay on the topic.

Exercise 6. Try to understand the information.

Exercise 7. Add some information & make up a small report and give a talk in class.

Exercise 8. Read the information & pick up the essential details in the form of quick notes.

Exercise 9. Explain the title: Back pain victims are getting younger.

Backache is reaching epidemic proportions, according to a Government survey. And more and more young people are affected. Two out of five adults questioned claimed to have suffered from back pain over the previous year. More than half had up with it for more than a month, while 16 % had endured it for the whole year. One in seven was actually in discomfort on the day of the survey.

And in the four weeks prior to that, eight % of victims had had to spend most or all some days lying down. One in 20 needed time off work. Yet fewer than half of the sufferers had visited a doctor or specialist during the year. The survey of 2,000 adults conducted by the Office for National Statistics found that overall, 40 % of those questioned were back pain victims, compared with 37 % in 1993.

The biggest increase was among the 16-24 age group – up from 24 to 30 %. Fitness and posture lessons, along with pain distraction techniques, are also used while specialists no longer recommend prolonged bed rest, saying it worsens the problem.

Exercise 10. Comment on the text « Facts about the way man poisons himself».

Alcoholic drinks and fornication defiles, also anything in excess. Drugs and smoking as well. What will happen to such people? The temple of God is holy, which temple you are. if any man define the temple of God him shall God destroy.

Smoking causes heart and lung, vascular disease, gastric and duodenal ulcers. Cirrhosis of the liver.

Alcohol. Continuous drinking leads to gastritis; enlarged veins in the stomach and rectum, haematemesis, cirrhosis of the liver and ascites. In some cases peripheral neuritis and cardio-renal degeneration. The drunkard shall come to poverty. Wine biteth like a serpent, and stingeth like an adder.

Saccharin. Small amounts wash Vitamin B1 out of the system. Mono-sodium glutamate causes allergies, palpitations, numbness at the back of the neck.

Aspirin upsets the protein balance in the body, the structure of the albumen being changed.

The acetyl in aspirin combines with the albumen. Many physiological and pathological changes could occur. Side effects range from asthma and other allergic reactions to the development of nasal polypi, kidney disease, gastric haemorrhage and blood disorders.

Salt in excess causes too much hydrochloric acid in the stomach, it irritates delicate membranes in the body, in the same way as it stings in a wound. It stimulates cell metabolism and is therefore harmful, and could increase the size of a tumour. It causes excess fluid to accumulate in the ears and sinuses, creating a waterlogged condition. There is sufficient salt in a normal diet.

A slimming diet if it is a low carbohydrate reducing diet, may give rise to loss of emotional control, as it may not provide sufficient sugar to support the normal functioning of the brain and nervous system. When the blood sugar is too low, the symptoms may be anything from nervousness and weeping to violence, panic or a feeling of impending doom. The principal fuel for the brain in glucose. Vitamin B is needed to metabolise this carbohydrate.

Syphillis may give rise to blindness and mental deficiency. Many neurological disorders occur later, also vascular changes, which lead to aneurysm. The Lord visits the iniquity of the fathers upon the children, and upon the children's children.

Lack of exercise results in poor circulation. As a result bones become decalcified and osteoporosis occurs. This is the reason why so many elderly people fracture so easily. The patient who has been in bed for some time, gets up, falls, and breaks a limb.

Antibiotics often kill off the normal useful organisms in the intestines. These organisms help by producing vitamins B and K. One of the functions of Vitamin B is to maintain healthy nervous tissue. Vitamin K is necessary for the clotting of blood. Yoghurt will help to replace these vitamins.

Exercise 11. Try to understand the information.

Exercise 12. Analyze the information and use it in practice.

Exercise 13. Translate the words and phrases into Ukrainian drawing up sentences with them.

Antibiotic; to prescribe antibiotics; to take antibiotics; broad-spectrum antibiotic; antibiotic treatment; antibiotic lozenges; antibiotic resistance; antibiotic sensitivity; antibiotic sensitivity test; antibiotic spectrum; antibiotic-resistant; antiblack tongue factor; semisynthetic antibiotic; antitumor antibiotic; antibiotic prophylaxis; antibiotic therapy; topical antibiotic therapy; prophylactic antibiotic cover; systemic antibiotic therapy.

Exercise 14. Translate the words and phrases into Russian drawing up sentences with them.

Fatal (mortal) wound; flesh (gaping) wound; light (slight) wound; serious (severe) wound; mortal wound; lips of the wound; to receive a wound; to clean a wound; to dress a wound; to suture a wound; to stop the wound; to swab a wound; bullet wound; festering wound; knife wound; self-inflicted wound; superficial wound; to inflict a wound (up)on smb.; to lick one's wounds; to wound smb.'s feelings; he that is afraid of wounds must not come near a battle; open old wounds ((re-)open old wounds); to give a wound; to wound mortally; to wound to death; wound dressing; wound edges; wound fever; wound infection; wound powder; wound repair; wound sepsis; wound shock; to wound smb.'s pride; wound-up; wounded; woundedly; woundily.

Exercise 15. Read the article and render its essentials in English.

Help in case of accident

Wounds – Remove patient to a quiet, airy place. Have hot and cold water, several basins, clean towels, cloth and soap. Apply antiseptic treatment as follows:

Thoroughly cleanse your own hands and nails; then cleanse the wounds with some antiseptic. The most easily procured is salt and water. Put a handful of salt in a quart of water and use freely. After the wound is cleansed, it must then be protected from new germs by some covering made germ-free by baking, boiling, or ironing. After the salt solution has been carefully used, apply strips of gauze soaked in warm water, which has been boiled. This will leave the wound in good condition.

If a more active antiseptic than salt, such as Carbonic Acid (1 %) or Bichloride of Mercury (1 part to 2,000 of water), is available, it should be used.

Artificial respiration – When the patient is removed from the water, gas smoke, or electric contact, get to work at once with your own hands. Lay the patient on his stomach.

Extend one arm directly overhead. Bend the other arm at elbow, and rest patient's cheek on hand, to keep the nose and mouth off the ground and free for breathing. Kneel facing forward and straddling patient's legs just above the kneels.

Place palms of hands on each side of back just about the belt line, and about four inches apart, thumbs and fingers together, the little fingers over and following the line of the lowest ribs, and the tips of fingers just out of sight. With arms straight lean gradually forward, pressing downward and forward and counting slowly, one, two, three. Snap your hands sideways, off patient's back. Swing your body back, counting slowly, four, five. Rest. Straighten arms and repeat pressure.

Three movements straight arm pressure (shoulder behind hands to exert forward pressure), quick release and swing back. Keep up work steadily until breathing begins and continues naturally. When helpers arrive put them to work; send for physician; clean patient's mouth of obstruction; stimulate reflexes; loosen tight clothing; rub legs and body toward heart; supply clothing and other heated articles and relieve operator when tired. Place aromatic spirits of ammonia near patient's nose at frequent intervals. When patient begins to breathe naturally, and can swallow, give a teaspoonful of aromatic spirits of ammonia in half glass of water, or some hot coffee or tea.

Don't get discouraged. Stick to it for two, even three, hours if necessary.

Burns and **scalds** – Cover with Cooking Soda and lay wet cloths over it. Whites of Eggs and Olive Oil. Olive or Linseed Oil, plain or mixed with chalk.

Lightning – Dash cold water over person struck. Artificial respiration as above.

Exercise 16. Read the fragment from "Three Men in a Boat" by J. K. Jerome "Getting ill" and summarize the contents in English.

There were four of us – George, and William Samuel Harris, and myself, and Montmorency. We were sitting in my room, smoking and talking about how bad we were – bad from a medical point of view, of course. We were all feeling seedy, and we were getting quite nervous about it.

Harris said he felt such extraordinary fits of giddiness, come over him at times, that he hardly knew what he was doing: and then George said that he had fits of giddiness too, and hardly knew what he was doing. With me, it was my liver that was out of order.

I knew it was my liver that was out of order, because I had just been reading a patent liver-pill circular, in which were detailed the various symptoms by which a man could tell when his liver was out of order. I had them all. It is a most extraordinary thing, but I never read a patent medicine advertisement without being impelled to the conclusion that I am suffering from the particular disease therein dealt with in its most virulent form.

The diagnosis seems in every case to correspond exactly with all the sensations that I have ever felt. I remember going to the British Museum one day to read up to treatment for some slight ailment of which I had a touch-hay fever, I think it was.

I got down the book, and read all I came to read; and then, in an unthinking moment, I idly turned the leaves and began to indolently study diseases, generally. I forget which was the first distemper I plunged into, and, before I had glanced half down the list of "premonitory symptoms", it was borne in upon me that I had got it.

I sat for a while frozen with horror; and then in despair, I again turned over the pages. I came to typhoid fever – read the symptoms – discovered that I had typhoid fever, must have had it for months without knowing it – wondered what else I had got; turned up St. Vitus's Dance, found, as I expected, that I had that too – began to get interested in my case, and determined to study it to the bottom, and so started alphabetically – read up malaria and learnt that I was sickening for it, and that the acute stage would commence in about another fortnight... Cholera I had, with severe complications; and diphtheria I seemed to have been born with. I looked through the twenty-six letters, and the only malady I could conclude I had not got was housemaid's knee.

Then I wondered how long I had to live. I tried to examine myself. I felt my pulse. I could not at first feel any pulse at all. Then, all of a sudden, it seemed to start off. I pulled out my watch and timed it. I made it a hundred and forty-seven to the minute. I tried to feel my heart. I could not feel my heart. It stopped beating. I have since been induced to come to the opinion that it must have been there all the time and must have been beating, but I cannot account for it.

I patted myself all over my front, from what I call my waist up to my head, and I went a bit round each side, I tried to look at my tongue. I stuck it out as far as ever it would go, and I shut one eye, and tried to examine it with the other. I could only see the tip, and the only thing that I could gain from that was to feel more certain than before that I had scarlet fever. I had walked into that reading room a happy, healthy man. I crawled out a decrepit wreck.

TOPICAL VOCABULARY

wound – рана; ранение

fatal (mortal) wound – смертельная рана
flesh (gaping) wound – зияющая рана
light (slight) wound – лёгкое, незначительное ранение
serious (severe) wound – тяжёлое ранение
lips of the wound – края раны
to receive a wound – получить ранение
to clean a wound – промыть рану
to dress a wound – перевязать рану
to suture a wound – зашивать рану
to stop the wound – остановить кровь из раны
to swab a wound – накладывать тампон на рану
bullet wound – пулевое, огнестрельное ранение
festering wound – гноящаяся рана
knife wound – ножевое ранение
self-inflicted wound – ранение, нанесённое самому себе
superficial wound – неглубокая рана
to inflict a wound (up)on smb. – нанести кому-л. оскорбление
to lick one's wounds – зализывать раны (приходить в себя, восстанавливаться после душевной или физической травмы)

to **wound** – ранить; причинять боль, задевать *Syn. bruise, cut, lacerate, scar*

to wound smb.'s feelings – задеть чьи-л. чувства
He was wounded in his deepest affections. – Он был оскорблён в своих лучших чувствах.
He that is afraid of wounds must not come near a battle. – "Боишься ран, держись подальше от боя" (волков бояться – в лес не ходить)
to lick one's wounds – "зализывать свои раны", оправляться после поражения
to give a wound – нанести рану
to wound mortally – ранить смертельно
to wound to death – нанести смертельное ранение
wound dressing – повязка на рану
wound fever – травматическая лихорадка
wound infection – раневая инфекция
wound powder – (стерильный) порошок для лечения ран
wound repair – заживление раны
wound sepsis – раневой сепсис
wound shock –травматический шок
wound smb.'s pride – задеть чьё-л. самолюбие
wound-up – рассерженный; раздражительный, в беспокойном состоянии
I was too wound-up to relax. – Я был так взвинчен, что не мог расслабиться.

neck – шея

to break the neck – свернуть шею
to get it in the neck – получить по шее; получить нагоняй
up to the neck – по горло, по уши
neck vertebrae – шейные позвонки
to win by a neck – победить с минимальным преимуществом
hey necked their Queen. – Они отрубили голову своей королеве.
to break one's neck – сломать себе шею, погубить себя; нестись сломя голову

We broke our necks to get there on time. – Мы мчались сломя голову, чтобы попасть туда вовремя.
to get it in the neck – получать нагоняй

I don't know why I should get it in the neck for something I haven't done. – Я не понимаю, почему я должен получать втык за то, чего не делал. He was afraid he'd get it in the neck for being late. – Он боялся, что ему попадет за опоздание You're going to get it in the neck for that remark. – Ты еще получишь по шее за то, что ляпнул такое.

neck and neck – ноздря в ноздрю
to risk one's neck (to take a great risk) – put one's life in danger
to stick one's neck out – высовываться

He doesn't like to stick his neck out. – Он не любит высовываться. Why should I stick my neck out for her? – Почему я должен рисковать ради нее?

up to one's neck (in) (deeply involved) (in) – по горло, по уши (в чём-л.)

He's in it up to his neck. – Он в это дело ушел с головой. We are all up to our necks in your problems – Мы только и делаем, что занимаемся твоими проблемами. She was up to her neck in misery. – Она была глубоко несчастной.

to catch (get, give, take) it in the neck) – испытать на своей шкуре; получить по шее, нагоняй, хорошую взбучку; досталось на орехи

neck and crop – быстро, стремительно; не церемонясь; с применением физической силы
neck or nothing – либо пан, либо пропал
to put one's neck in a noose – самому лезть в петлю
a stiff neck – упрямство, упорствование (в ошибках, заблуждениях)
stiff-necked – прямый, не поддающийся (убеждению, просьбам)
stiff-necked attitude – негибкая позиция
to tread on smb.'s neck – притеснять, угнетать, подавлять кого-л.

lung – лёгкое the lungs – лёгкие lung lobe – доля лёгкого
at the top of one's lungs – во весь голос, во всё горло, во всю глотку
good lungs – сильный, зычный голос
lung abscess – абсцесс легкого
lung capacity – объём лёгких
lung fever – крупозное воспаление лёгких
lung motor – аппарат искусственной вентиляции легких

tongue – язык
furred (dirty, foul, coated) tongue – обложенный язык (у больного)
I knew him by his tongue. – Я узнал его по манере говорить.
glib tongue – бойкая речь

He has a ready tongue. – Он за словом в карман не полезет. His tongue is too long for his teeth. – У него слишком длинный язык.

to find one's tongue – снова заговорить; (вновь) обрести дар речи
to have lost one's tongue – молчать, проглотить язык
to have too much tongue – что на уме, то и на языке
to hold (keep) a still tongue in one's head – молчать; держать язык за зубами
to oil one's tongue – льстить
to speak with (one's) tongue in (one's) cheek – говорить неискренне, с насмешкой, иронией, лукаво
at the gift of tongues – дар говорения на языках
to call smb. everything one can lay one's tongue to – ругать на чём свет стоит
She's called me everything she can lay her tongue to. – M. Хардуик ругала меня на чем свет стоит.
a good tongue is a good weapon "острый язык – хорошее оружие"
to have a smooth tongue – быть красноречивым; быть льстивым

to click one's tongue – щёлкать языком

to put out one's tongue – показывать язык (врачу)

to stick out one's tongue at – показать кому-л. язык (из озорства)

to run one's tongue over one's lips – облизнуть губы

to have lost one's tongue – замолчать, потерять дар речи; проглотить язык

to have a glib tongue – быть бойким на язык; он за словом в карман не лезет

But you've lost your tongue. Haven't you ever talked to a girl before? – Да вы что, язык проглотили? Никогда в жизни не разговаривали с девушками?

to keep a still tongue in one's head – отличаться молчаливостью; держать язык за зубами

I'll tell you what I know, because I believe you can keep a still tongue in your head if you like. – Я расскажу вам то, что мне известно, так как знаю, что вы умеете держать язык за зубами, если захотите.

to hold one's tongue – придержать язык, молчать

to have one's tongue in one's cheek – говорить с иронией, отшучиваться

a slip of the tongue – оговорка

to wag one's tongue – говорить зря; сплетничать; болтать

(with (one's) tongue in (one's) cheek)) – неискренно, лицемерно

a tongue as long as a stock-whip – длинный язык

a still tongue makes a wise head – говори меньше, умнее будешь

to set tongues wagging – вызвать толки, дать повод для сплетен

on the tongues of men – у всех на устах

one's tongue runs nineteen to the dozen – он говорит, трещит без умолку

Your tongue runs nineteen to the dozen, there is no getting in a word with you. – Ты так трещишь, что слово вставить невозможно.

one's tongue runs before one's wit – он сперва говорит, а потом думает; язык наперёд ума рыщет

one's tongue is too long for one's teeth – у него слишком длинный язык

Wasn't your tongue a little too long for your teeth just now? – Вам не кажется, что вы сейчас сболтнули лишнее?

to have a nasty/sharp tongue – иметь злой язык, быть острым на язык

one's tongue cleaved to the roof of one's mouth – у него язык к гортани прилип

a honey tongue, a heart of gall – на устах мёд, а в сердце лёд; мягко стелет, да жёстко спать

his tongue failed him – он лишился дара речи

Miss Austen had a sharp tongue and a prodigious sense of humour. – У мисс Остин был острый язычок и удивительное чувство юмора.

to have a tongue in one's head – на то и язык дан (молчащему, когда надо высказываться)

If you didn't know the way, you should have asked. You have a tongue in your head, haven't you? – Если ты не знал дороги, разве нельзя было спросить кого-нибудь? Язык тебе для чего дан?

coated tongue – обложенный язык

to have a long tongue – быть болтливым, разговорчивым

tongue twister – скороговорка

to have an oily tongue – быть льстивым; на языке мёд

to have a smooth tongue – быть красноречивым; льстивым

to speak in tongues – говорить на неведомом языке в состоянии религиозного экстаза

The Biblical record has only a few isolated cases of people speaking in tongues upon receiving the Holy Spirit. – В Библии описаны всего несколько не связанных друг с другом случаев, когда люди начинали говорить на неведомом языке после того, как на них снизошёл Святой Дух.

Exercise 1. Analyze the topical vocabulary, learn it by heart and make up sentences with it.

Exercise 2. Read the information & pick up the essential details in the form of quick notes.

DIALOGUE

- Hello, Mary, why so glum? Anything amiss (1)? You seem to be out of sorts (2).
- Mother's in the hospital, you know. Just been operated on.
- Oh, how I feel for you, poor thing.
- I thought I would go off my head (3). But Doctor Smith, you know him, don't you?
- By sight only.
- Well, Doctor Smith was out of town. He had just gone to the country for his vacation. I was at my wits' end. Yet something had to be done.
- You should have turned to Boris for help. He would have helped you to see the whole thing through.
- He's been giving me a wide berth (4) these last few weeks. Didn't you know?
- What next!
- I have no patience with him. Let's drop the subject. Other things are more important.
- Yes. You're right. Well, tell me how you talked the doctor into performing the operation. Weren't you afraid to tackle the job?
- No, too much was at stake (5), besides I didn't have to do any persuading at all. He's such an old dear, he came away with me at once. I was so glad, I could have jumped for joy. Just think, to go by car some 50 kilometres and make such an operation! He was all in when it was over, but just his dear old smiling self!
- I can imagine! You must have been on tent hooks (6) during the operation.
- I wonder how I lived through it all - I was simply at the end of my tether. I must get mother to a health resort. That'll be no easy matter, now that the season is at its height.
- You're not one to let the grass grow under your feet (7). Yet, again I am certain it would save you a lot of time and trouble if you had Boris to see to the thing. What with so much work and worry and sitting for the exams, you have hardly any time to spare.
- I don't know. Mother's state is such that I feel I'll have little trouble sending her to a resort, for the doctors are doing all they can to help me. With their aid I am certain all will be well. As for Boris, I prefer not to speak of him. If a friend doesn't stand by (8) when one is in trouble, then he's no friend and that's all there is to it as far as I am concerned. I wanted to have it out with him but now I'm going to let sleeping dogs lie (9).
- You shouldn't be so bitter.
- I am too tired and exhausted and sore at heart to think of anything but mother.
- You do seem to be down on your luck (10), and just when things are taking a turn for the better.
- That's so. I'm so glad I met you. But for you I'd have no one to pour out my heart to and I've had some dreadful moments.
- I'm sure a few days will put you right, and now Mary, I must be off, willy-nilly (11). Best regards to your mother. So long!
- Listen, Ann. If you manage to find a few spare moments, do drop in. And now - so long!

Exercise 1. Learn the dialogue by heart and carry it on with your classmate in class. Render the contents of the dialogue in Indirect Speech in English.

Exercise 3. Read the story and explain the main idea of it.

It is so important for me

One day the dog of Joseph Turner (a famous English painter of the XIX century) broke a leg. The artist loved his dog very much and spared no pains to have it well again. So he sent for the best surgeon in London instead of taking a veterinary. When the medical man arrived, Turner said to him by way of an apology, "my dog has broken a leg. I know that you are too great a doctor for such a patient, but I beg you to help my dog. It is so important for me". The surgeon felt annoyed but did not show it. The next day the medical man asked Turner to come to his house. The artist thought that the surgeon wanted to see him in connection with his dog. When he arrived at the doctor's, the medical man said, "Mr. Turner, I'm so glad you've come. My door needs painting. I know that you're too great a painter for this work, but I beg you to do it. It is so important for me".

VOCABULARY NOTES

(1) *to be (go) amiss* – to be wrong, out of order in a wrong way

1. Beatrice needs some practical experience - that is really all that is amiss. (Gr.Greene)

2. And yet, with the instinct of one who has for some years known what it is to be a hunted man, he felt a growing uneasiness a vague sense of menace. He could detect nothing amiss.(A.Christie)

3. "Well?" said Val, at last. "I'm sorry your Sleeping Dove colt's gone amiss, Dartie." (J.Galsworthy)

(2) *to be out of sorts* – to be in low spirits; to be in a bad mood; to be unwell

1. "I've been out of sorts all day," he said as they walked out of Grey Lion. "I was up till two this morning with the books and at the factory at seven. I don't know whether I'm alive or dead." (J.Braine)

2. You've a hard day at the mill, you eat a meal here feeling out of sorts to begin with, something's not just to your liking, so you are prejudiced forever afterwards. (J.Braine)

3. "Can you remember when you first felt out of sorts?" "When I came to tea with you there, in that garden house." "A somewhat unlucky party. Aziz and old Godbole were both ill after it too!" (E.Forster)

4. You shouldn't have come here, mother; I'm a bit out of sorts. (J.Galsworthy)

(3) *to go (drive somebody) off one's head* - to become (make) silly or mad; to make foolish; to behave foolishly

1. The wife of a deputy Commissioner had gone off her head about him. (J.Galsworthy)

2. This isn't a climate for emotion. It's a climate for meaners, malice, snobbery, but anything like hate or love drives a man off his head. (Gr.Greene)

(4) *to give somebody a wide berth* - to keep clear of; to keep out of one's way; to avoid; to keep at a safe distance from

1. Making up his mind to give both the Ambassadors a wide berth, he set about his work. (W.S.Maugham)

2. In their journey ... all they saw was an occasional burnt-out village ... absolutely deserted... They had given it a wide berth. (R.Fox)

3. I should avoid the woods and orchards if I were you and give a wide berth to the horned beasts on the farm. (H.Munro)

(5) *to be at stake* – to be won or lost; to be risked; to be in danger

1. Before, it was different – there was only you at stake. (J.Osborne)

2. "Don't swear," she interrupted. Her reproof startled him. "That's it," he said, "at a high moment where what seems your life's happiness is at stake, you are afraid of life in the same old way – afraid of life and a healthy oath." (J.London)

3. I should have been a fool to risk my life. Nothing that concerned me was at stake. (W.S.Maugham)

4. What was left of my honour was at stake. (I.Murdoch)

(6) *to be on tenterhooks* – to be in a state of anxiety or suspense

1. Though Ashenden knew very well that no letter would ever come for her he had not the heart to keep her on tenterhooks. (W.S.Maugham)

2. "She is going to have another baby, is she?" "She must be on tenterhooks, oh, she must be suffering." (G.Gordon)

(7) *not to let the grass grow under one's feet* – to waste no time before doing what is necessary

1. He was a real attorney. He did not allow any grass to grow under his feet, you bet. (Th. Dreiser)

2. He would let Timothy have a bit of his mind, and see if he would go on dropping hints! And he would not let the grass grow under his feet either. (J.Galsworthy)

(8) *to stand by* – to remain faithful to

1. There was nothing in common between these two men and this fact Fortune grasped sufficiently to wonder sometimes why Uri had stood by him. (R. Fox)

2. It was over, and she, down and out. He must stand by her and keep his mouth shut. (J.Galsworthy)

(9) *to let sleeping dogs lie* – to let well alone; not to look for trouble

1. The bedroom door was closed and he began to move towards it. Then he stopped. Let sleeping dogs lie. (Gr. Greene)

2. ... and we might have found an inquiry necessary. As it is, let sleeping dogs lie. (R. Fox)

(10) *to be down on one's luck* – to have a stroke of bad luck; be unfortunate; to suffer misfortune

1. Well, Lumley, I'm sorry you're down on your luck. (J. Wain)

2. Andrew had known, of course, that Evans was down on his luck, but he had not suspected anything so pitiful as this. (A.Cronin)

(11) *willy-nilly* – whether one will or not

1. "Beauty? That's a matter of temperament." "But doesn't it divide people more than anything?" "Yes, but willy-nilly. You can't make yourself love a sunset." (J.Galsworthy)

2. It is because Socialism is inevitable; because the present rotten and irrational system cannot endure... The Slaves won't stand it. They are too many, and willy-nilly they'll drag down the would be equestrian before ever he gets astride. (J.London)

Exercise 4. Analyze the vocabulary notes attentivly.

Exercise 5. Translate phrases from the text below & draw up sentences with them.

Грань, осторожный, осмотрительный, идти на пари, форма, сложные проценты (на капитал), наследник, иметь шансы получить (деньги), неизбежный, особый, индивидуальный, нарушение, расстройство, обмен веществ, удар, паралич, заболеваемость, продолжительность жизни, жизнеспособность, ограничение, вызывать сенсацию, липоевая кислота, питательное вещество, сторонник, потребление, бесполезный, текущий, эмбриональная клетка, хорошо воспитанный, страдание, словесный, невредимый, опыт, желтуха заражение крови, справляться со стресом, внезапная перемена в настроении, агресия, раздражительность.

Exercise 6. Learn the dialogue by heart. Render its contents in Indirect Speech in English.

Mr. Wells is ill

MRS WELLS: Shall I phone and tell your secretary you're not coming today?

MR WELLS: Yes, please, dear. Tell her I've got a cold and a sore throat, but hope to be back in a day or two. You'd better say I'm staying in bed.

MRS WELLS: But you're not in bed! Do you want me to tell a lie?

MR WELLS: Oh, it's only a very little one, dear. I'm not making a false excuse. My throat really is sore. It's quite painful.

MRS WELLS: Then put that cigarette out. It's very foolish of you to smoke when you've got a sore throat.

MR WELLS: Very well, dear. You're quite right.

MRS WELLS: You don't always obey me so quickly.

MR WELLS: Don't I? I think I'm a very obedient husband.

MRS WELLS: Look, here's a jug of boiling water. Do as I tell you now. I've put something in the water that'll do you a lot of good. Wrap this towel round your head and put your nose over the jug. That's right. Breathe in, deeply. It'll do you a lot of good.

MR WELLS: It smells nice.

MRS WELLS: Now, another deep breath. Fill your lungs. Now breathe out. Slowly! Now breathe in again. Go on doing that for five minutes while I go and make that phone call to the office.

Exercise 4. Learn the dialogue by heart. Render its contents in Indirect Speech in English.

- What are you looking so glum about? Is anything the matter or are you just feeling the heat a bit?
- My little sister is seriously ill. The doctor diagnosed her case as chronic pneumonia. It was out of the blue.
- Didn't you notice the symptoms of the disease before?
- Yes, once in a while she coughed but we put it down to a slight cold.
- Well, it simply doesn't make sense. She always looked the picture of health. People can't get ill like this.
- You see once she had pneumonia and evidently it's been dragging on ever since. We didn't catch it in time I think. I rather think they'll put her right what with these new medicines and good treatment. The doctors are very kind. Anna, for one, has a heart of gold.
- How is the girl feeling now?
- A little bit better, thank you. But she is rather listless.
- I'm terribly sorry for her, poor thing.
- Well, in autumn I'm going south and will take little Jane with me. I do hope that two-month there will bring her back to health.
- Oh, make the most of your vacation.

Exercise 7. Translate phrases from the text below & draw up sentences with them.

Сознание, легальный, законный; запрещенный; влиять; иметь влияние на; состояние возбуждения; раздражительный; нервный; обезболивающее, анальгетик; поддерживать связь с; усталость; исчезать, проходить; зависимый от (чего-то, кого-то); транквилизатор, успокаивающее; понижать; рассказывать, докладывать; чувствительность, восприимчивость; сенсорный; коммуникабельный; квалифицированный совет семейной паре; развлекательный; сильный, суровый, интенсивный; искажение (фактов); душевнобольной, озабоченный; галлюциноген; восприятие; болячка; гепатит (желтуха); указывать; потеря; бессонница; нервное или подозрительное поведение; запах; пятно; переживать; печальный, неприятно удивленный; любопытство; выход; разрушительный, опустошительный.

DRUGS

Every human society uses some drugs to change people's state of awareness. Drugs can mean everything from cigarettes and alcohol to heroin, opium, amphetamines, LSD and cocaine. In our society the main drugs are alcohol, nicotine and caffeine, while in Peru chewing cola leaves (which are used to produce cocaine) is an everyday activity, and in some Middle Eastern countries smoking hashish (marijuana) or opium is legal while alcohol is banned. Drugs which can influence our state of consciousness are known as psychoactive drugs.

All psychoactive drugs affect the nervous system in some way, but they have different effects by influencing different parts of it. For example, caffeine, which we take in coffee or cola drinks, acts on the autonomic nervous system to produce a state of arousal in the body. So it is not surprising that it helps people to wake up in the morning, but in large quantities it can make one irritable and edgy.

Morphine and heroine are sometimes used medically, because they are powerful painkillers. People who take the drug report that it makes them feel euphoric, as though they are not quite in touch with reality, and good because there is no physical discomfort or fatigue at all.

But the problem is that when it wears off, people feel very unpleasant, so it is extremely easy to become both physically and mentally addicted to these drugs. Marijuana was widely used as a tranquillizer in the nineteenth century, and for over two thousand years in the Far East.

We know that it acts as a mild depressant, damping down the action of the autonomic nervous system and producing muscular relaxation. Because of this some users report a sense of time passing very slowly, and an increased sensitivity to sensory stimulation such as music or act. Ecstasy, or MDMA, is a highly prosocial drug.

In other words, it makes people feel social and pleasant towards one another. It also enhances awareness of music and colour. Ecstasy is often associated with rave music and huge discos, especially in Western Countries. It is interesting, that MDMA was discovered in 1914 and was used in marriage guidance counselling, to ease the tension between people so that they could talk over their problems more effectively.

In 1970s, however, it became popular as a recreational drug, and has now been made illegal.

The stimulant drugs known as amphetamines, or "speed", also sometimes seem to have a prosocial effect, at least in small doses. But in large doses, amphetamines can lead to severe mental illness, known as amphetamine psychosis. This involves a distortion of reality, the person often becomes extremely paranoid and disturbed. Amphetamines are also highly addictive drugs.

Another well-known psychoactive drug is known as LSD, or sometimes as "acid". It is a hallucinogen, which means that people who take it can also experience hallucinations seeing things, which are not actually present. Both natural and synthetic drugs can change our moods, our state of awareness and our perception of reality. They can infect the system leading to sores, jaundice, blood poisoning and AIDS disease. Many signs indicate that a person is taking drugs, for example, sudden changes of mood, irritability, aggression, loss of appetite, loss of interest in hobbies or friends, insomnia, furtive behaviour, unusual smells, stains on the body.

What pushes people to take drugs? There are many reasons.

Some people turn to drugs to help relax and cope with the stress and problems of their lives. Some experience many pressures at school, work, from parents, friends, they are loved, frightened or frustrated. Still others take drugs simply out of curiosity but often become addicted. Some people want to make their experiences. Many people think that drugs are the best way-out. However they do not realise how devastating and dangerous they are.

Exercise 1. Digest the score of the information briefly in English.

Exercise 2. Make up some dialogues from the information above.

DIALOGUE «AT THE DRUG STORE»

- (Drug clerk, greeting Mr. White) Good evening, Mr. White. What can I do for you tonight?
- I have a long list of things, which my wife gave me. (Consults list) Iodine, aspirin, a roll of adhesive tape...
- A small bottle of iodine, I suppose. What size box of aspirin? We have boxes of 10, 25, and 100 tablets.
- Give me the largest size. I also want *a tube of toothpaste*, Colgate's – and a toothbrush. Let me see the toothbrushes, please.
- We have a special on toothbrushes today – regular $ 6, two for 9.
- What's wrong with them that they are selling so cheap?
- It's an introductory offer – a new product that has just come on the market. They seem to be very good toothbrushes. They come in several colours and sizes. There is also hard, soft, and medium. The bristles are made of nylon and guaranteed not *to fall out*.
- But I really need only one toothbrush. Besides, whenever I buy a new toothbrush I always give the old one to my wife. (Still reading from list) My wife wants two *boxes of cleansing tissue*. She also wants you to fill this *prescription* for her. It's something the doctor gave her to help her to reduce. I guess that's about all.
- Do you need any *vitamin pills, after-shaving lotion*, cold tablets? We have some excellent vitamin preparations.
- Nothing else, thanks. About how long will it take to fill that prescription?
- I can have it for you in about ten minutes. Do you want to wait or will you drop back later?
- I'll wait for it.

Exercise 1. Learn the dialogue by heart and carry it on with your classmate in class. Render the contents of the dialogue in Indirect Speech in English. Translate the dialogue paying attention to italic phrases.

Exercise 2. Answer the questions.

1. Is taking drugs the problem of drug takers only? 2. What are the main threats of taking drugs? 3. Why do young people take drugs? 4. Would you try some mild drugs if you had an opportunity? Why? Why not?

Exercise 3. Translate the sentences into Russian.

1. She has drugged all her life. 2. There is no way that she will stop drugging by herself. 3. He got drugged up to the eyeballs on tranquillizers. 4. You drug me. 5. Her constant hitching drugs me. 6. Man, am I drug! 7. If other players are drug about it or feel that I am trying to horn in then it's not much fun. 8. A new drug aimed at sufferers from Parkinson's disease. 9. They were drugged to keep them quiet. 10. She was convinced he was out drinking and drugging. 11. Mass adoration is a highly addictive drug. 12. The drug will be useful to hundreds of thousands of infected people. 13. His mother was on drugs, on cocaine. 14. She was sure Leo was taking drugs. 15. The problem of drug abuse and drug traffic continues to grow. 16. He grew tired, and drifted off into a drugged sleep.

Exercise 4. Translate the words and phrases into Russian drawing up sentences with them.

Drug, mild drug, powerful (strong) drug, toxic drug, weak drug, habit-forming drug, non-addictive drug, nonprescription (over-the-counter) drug, prescription drug, proprietary drug, sulpha drug, to administer (prescribe) a drug, to take a drug, drug dealer (pusher, drug trafficker), to take drugs, to peddle (push, sell) drugs, to traffic in drug, hard drug, soft drug, illegal (illicit) drug, designer drug, to be on drugs, a drug in the market, drug abuse, counterfeit drug, dangerous drug, over-the-counter drug.

Exercise 5. Add some in formation and make up a small report and give a talk in class.

Exercise 6. Read the article on medicine and health.

"Medicines are not meant to live on", an English proverb says. Yes, that's true and we may add that good health is better than the best medicine. And if your health is good, you are always in a good mood. You have "a sound mind in sound body", as the old Latin saying goes.

The English proverb "Sickness in the body brings sickness to the mind" express a similar idea, but from a different point of view. Taking medicines is an unpleasant thing, of course, and if you want to avoid it, you should go in for sport and keep yourself fit. Physical exercise is necessary and very important. As doctors say, if a grown-up person doesn't take exercise, he can easily catch an illness. Physically inactive people get old earlier than those who have plenty of exercise. If you do daily exercises, you feel refreshed, you have a good posture, and that makes you feel good.

So pay attention to the way you stand, walk and sit. Here are some of the rules for health:

Take long walks in the open air as often as you can. Keep your body clean.Keep your teeth clean. Wear clean clothes. Sleep with your window open.

When you are reading or writing, let the light come from behind your left shoulder.

Exercise 7. Answer the questions.

If the worst comes to the worst and you have to take medicine, you should know some rules.

Probably you know them, but here are some questions to test your knowledge.

1. Why must you wash your hands before you take medicine?
2. How can you catch an infection?
3. Why must you keep medicines in a place where small children can't get them?
4. Is it because they may make small children ill?
5. 3. Is it advisable not to keep medicines in a warm place? Where should they be kept?

Exercise 8. Discuss the following subjects.

1. How children's health is protected in our country. Is one of the main functions of the kindergarten to look after the child's health? In the summer the children are taken to the countryside, aren't they? Do you know that a monthly medical examination in the kindergarten includes eyes, teeth and general health? Do school pupils have a medical examination several times during the year? Can a child be sent to a sanatorium for treatment? What about summer camps?

2. What a person should do to keep in good health.

3. How not to miss lessons for reasons of health.

Exercise 9. Do the tasks.

1. Describe to your partner a person who is healthy in body and mind.
2. Ask your partner on what occasions he has had to see the doctor.
3. Discuss what can be interesting in the professions of nurse, doctor, radiographer.

Exercise 10. Read a joke «A tired tongue» and answer a question.

DOCTOR: I've examined you very carefully. I think all you need is a good rest.

WOMAN PATIENT: But I still feel sick. Why don't you look at my tongue?

DOCTOR: It needs a rest too.

Question. Why does the doctor say his patient's tongue needs a rest?

Exercise 11. Read and dramatize a short dialogue.

"Oh, doctor", said a pompous rich man, "certainly I have sent for you; still, I must confess that I have not the slightest faith in modern medical science".

"Well",answered the physician, "that does not matter in the least. You see, an ass has no faith in the veterinary, and yet he cured him all the same".

Exercise 12. Generate all events which are in the text.

Exercise 13. Write all new words and phrases on the topic.

Exercise 14. Read the story «Good advice» and retell it in some English sentences.

Having examined his patient the doctor said to him: "I shan't prescribe you anything, medicine won't help you. You need a complete change of living. Get away to some quiet country place for a month or two. Go to bed early, eat fresh vegetables, drink plenty of good milk and smoke just one cigar a day." A month later the patient re-appeared in the doctor's consulting room. He was quite a new man, he looked healthy and fresh, and the doctor told him so.

"Yes, doctor, your advice certainly did it. I spent a month in the open air. I went to bed early and did all the other things you told me to. But I must say, doctor, that one cigar a day almost killed me at first. It's no joke to start smoking at my age."

Exercise 15. Answer the questions.

1. Did the doctor examine the patient attentively enough? 2. Did he prescribe him any medicine? 3. Why didn't he prescribe him any medicine? 4. What advice did the doctor give him? 5. Did the patient follow the doctor's advice? 6. How did the patient look when he re-appeared in the doctor's consulting room after a month's rest? 7. How did the patient spend the month? 8. Had the patient smoked before? 9. Was it easy (healthy) to start smoking for a person rather well advanced in age? 10. Is it always necessary to follow all the items of the doctor's advice? 11. Was it imperative for the patient to start smoking? 12. Must we use common sense while following the doctor's prescriptions?

Exercise 16. Read the story «A dumb wife» and comment it.

There was once a man whose wife was dumb, and this made him very sad because he loved her dearly. Once he went to a surgeon and asked: "Can you make my wife speak?" "Yes, I think I can," said the surgeon, "the operation is rather dangerous, but I will do my best if your wife agrees to undergo it." "Certainly, you must try, I shall bring my wife to your surgery tomorrow."

The next day the operation was performed. It was a success and the dumb wife began to speak. Within a few hours she spoke so much, so loudly that her poor husband ran back to the surgeon and said: "Can you make my wife dumb again?"

"No," said the surgeon, "there are many ways to make a dumb woman speak, but there is not a single remedy to make a talkative woman silent." "What shall I do?" said the poor man. "I'll soon die if I have to listen to her all day long." "Well," said the surgeon, "I can't make your wife dumb, but I can make you deaf, and then you will not have to listen to her." "Very well," said the poor husband, "do it quickly, it will be better than nothing."

Exercise 17. Tranlsate the sentences with key word «brain» into Russian.

1. He has **brains**. 2. You're the one with the brains. 3. Use your **brains**! 4. Some of the best **brains** in the country are here tonight. 5. "You know the Smiths?" "Yes, plenty of **brains** in that family". 6. He's the **brains** of the family. 7. Who's the **brains** around this joint? 8. An idle **brain** is the devil's workshop. 9. Excuse me, can I pick your **brain** for a moment? 10. Since we're up against a brick wall in the Stavanger case, I've come to pick your **brains**. 11. The power of thinking depends upon the **brain**. 12. An idle **brain** is the devil's workshop. 13. Two weeks had passed since Martin had seen him, and he vainly cudgelled his **brains** for some cause of offence. 14. She had a bad memory for names, and it irritated her not to be able to think of them, so that she would pause in the middle of some story to rack her **brains**. 15. He wants to pick your **brains** on medieval literature. 16. You have sucked (picked) my **brains**.17. Newcomers to Hawaii should be warned not to sit in the sun too long – they'll get their **brains** fried. 18. I expect you have more **brains** in your little finger than she has in her whole body. 19. You haven't got a **brain** in your head! 20. Gradually its meaning became clear to him; it soaked into his **brain**. 21. The only possible explanation was that the poor girl's illness and the loss of her lover had turned her **brain**. 22. I'm no **brain** but I get good grades. 23. Who was that **brain** who figured this out? 24. I am not a **brain** as you well know.

Exercise 18. Write a small essay on the topic.

DIALOGUE «I STILL FEEL VERY WELL»

A journalist has taken an interview. Here is what she says.

The other day I saw a white-haired man sitting on a bench in the park. I could see wrinkles in his face and neck and his wrinkled hands. The man seemed old but well preserved. I have been always interested in the secrets of longevity, so I decided to interview the man. The man said he had lived a full and active life without a moment's rest. "Well, they say that a lot of activity helps one to live a long time," I concluded. "That's true, very true. I still feel very well, although my step has slowed down a little." The conversation continued in that vein for a while. Then I decided to obtain more information. It seemed to me it would be all right to start with some discreet questions.

J.: Would you mind if I smoked a cigarette?

Man: Not at all.

J.: I'd offer you one, but I suppose you probably don't smoke, or drink, or...

Man: On the contrary! I've always smoked my head off. And until a little while ago I went dancing every night. As for alcoholic drinks...

J.: Do you mean to say that you've done these things all your life?

Man: Of course. Why does that surprise you so much?

J.: I've been always told that doing those things is bad for health.

Man: Ridiculous!

J.: I suppose that you have another secret: a lot of fruit, vegetables, a lot of exercise in the fresh air?

Man: Who told you so? I hate exercise in the fresh air, and I don't like any kind of vegetables.

J.: This is incredible!

Man: What do you mean, "incredible"? What are you talking about?

J.: It's just that I don't understand how you've been able to live that long. Tell me, how old are you if it isn't a top secret?

Man: Me? I'm thirty-seven. Why?

Exercise 1. Learn the dialogue by heart and carry it on with your classmate in class. Render the contents of the dialogue in Indirect Speech in English.

Exercise 2. Summarize your findings on the topic and issue in a short presentation.

C H A P T E R III. HEALTHCARE

UNIT I. THE PUBLIC HEALTH SERVICES

HEALTH SCIENCE

Health science or biomedical science is the applied science dealing with health. There are two approaches to health science: the study and research of the food that we eat; and the study and research of health-related issues to understand how humans and other animals function, and the application of that knowledge to improve health and to prevent and cure diseases.

Health research builds upon the natural sciences of biology, chemistry, and physics as well as a variety of multidisciplinary fields.

Some of the other primarily research-oriented fields that make exceptionally significant contributions to health science are biochemistry, epidemiology, genetics, and pharmacology (for a more comprehensive. A myriad of applied health specializations and professions also endeavor to better understand health, but in addition they try to directly improve the health of individuals and of people in general, as well as of other animals. Some of these are: alternative medicine, biomedical engineering, biotechnology, clinical laboratory science, medicine, nursing, nutrition, pharmacy, public health, psychology, and physical therapy.

The provision of services to improve people's health is referred to as health care. The health sciences industry, a multi-billion dollar business sector, is a cross-section of the life sciences and the health care and medical diagnostics industries.

Acquisition of health-related knowledge

Medical research is basic and applied research conducted to improve the evaluation of new treatments for both safety and efficacy in what are termed clinical trials, or to develop new treatments (referred to as preclinical research) or to better scale up health care interventions and improve health systems (e.g. health systems research and evidence based health care).

The increased longevity of humans over the past century is due in large part to medical research. Among the major advancements in medicine have been vaccines for measles and polio, insulin treatment for diabetes, classes of antibiotics for treating a host of maladies, medication for high blood pressure, improved treatments for AIDS, stains and other treatments for atherosclerosis, new surgical techniques such as microsurgery, and increasingly successful treatments for cancer.

New, beneficial tests and treatments are expected as a result of the human genome project.

Many challenges remain, however, including the appearance of antibiotic resistance, the obesity epidemic, the paucity of knowledge on how to better organize health care delivery.

Application of health-related knowledge (health care)

Health care is the prevention, treatment, and management of illness and the preservation of mental and physical well being through the services offered by the medical, nursing, and allied health professions. According to the World Health Organization, health care embraces all the goods and services designed to promote health, including "preventive, curative and palliative interventions, whether directed to individuals or to populations". The organized provision of such services may constitute a health care system. This can include a specific governmental organization such as the National Health Service in the UK, or cooperation across the National Health Service and Social Services as in shared care. There is a wide range of traditional areas of health care. The most common areas are: medicine, nursing, midwifery, pharmacy, dentistry, clinical laboratory sciences, and various forms of therapy to supplement the healing process.

They restore proper activity (dietetics, recreational, physical, occupational, orthotic care, speech, and respiratory). Like health science in general, health care includes both the study and application of preventing and curing human diseases and disorders. Medical doctors include physicians and surgeons.

There are many different branches of medicine; the other health care professions have specialties or focus on specific populations or settings of care. Public health studies the effect of environmental factors such as available health care resources on the health of the general population, often focusing on particular populations, such as mothers and children.

Dietitians educate people about proper nutrition, particularly specific dietary needs of populations such as people with diabetes, breastfeeding women, and people with celiac disease.

Other less common medical areas include first aid and triage.

Dental health has grown in importance in recent decades making dentistry a major field of health sciences. Counseling, hospice care, home care, nutrition, medical social work, alternative medicine, pharmacology, and toxicology are all considered part of health science.

Clinical laboratory sciences (*in vitro* diagnostics) is also a major field of health sciences. Veterinary medicine is the health science dedicated exclusively to the care of animals. Veterinary medicine is involved in preventing and curing animal diseases and disorders, inspecting animal-originated food (such as milk and meat) and animal husbandry. The public health services in our country embrace the entire population and are financed substantially by the state budget.

The medical services are steadily expanding and constitute a major item in the state budget.

The network of clinics (polyclinics), dispensaries, hospitals, maternity homes and children's dispensaries is constantly growing. You will find local medical centres not only in your neighbourhood but at all big factories and farms as well. The patient pays nothing for treatment. Medical centres here provide service free of charge. There are, of course, private practitioners who charge for visits.

Main emphasis in our country is laid on prevention or prophylactics. The saying has it that "an ounce of prevention is worth a pound of cure". Periodical medical examinations are practiced here, since a thorough examination helps to nip a disease in the bud (before it has taken root).A general examination is also required of persons planning to spend their holiday at a health resort.

The all-out effort against epidemics deserves special mention. Such diseases as the plague, cholera, smallpox, malaria and many others have been stamped out. Medicine is advancing further and is successfully combating cancer, the disease that takes a heavy toll of human lives. Much has been done to wipe out such a big man-killer as polio. Doctors no longer rely on guesswork and trust in luck. They have artificial lungs and hearts and electronic diagnosis devices at their disposal.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Answer the questions.

1. What is health science or biomedical science like? 2. How many approaches to health science are there? 3. What is health research built on? 4. What are some of the other primarily research-oriented fields? 5. How many applied health specializations and professions are there? 6. What are they? 7. What is referred to as health care? 8. What is medical research like? 9. The increased longevity of humans over the past century is due to medical research, isn’t it? 10. What are among the major advancements in medicine? 11. What are expected as a result of the human genome project? 12. What kinds of challenges remain? 13. What is health care like? 14. What does the World Health Organization say about health care? 15. What is a health care system like? 16. Is there a wide range of traditional areas of health care? 17. What are the most common areas? 18. Whom do Medical doctors include? 19. What do less common medical areas include? 20. What is main emphasis in our country laid? 21. Are periodical medical examinations practiced here? 22. The medical services are steadily expanding and constitute a major item in the state budget, aren’t they? 23. What deserves special mention? 24. Is medicine advancing further? 25. Doctors no longer rely on guesswork and trust in luck, do they?

Exercise 3. Expound core principles.

The NHS states the following as core principles: "The NHS was born out of a long-held ideal that good healthcare should be available to all, regardless of wealth. At its launch by the then minister of health, Aneurin Bevan, on July 5 1948, it had at its heart three core principles:

- That it meet the needs of everyone.
- That it be free at the point of delivery.
- That it be based on clinical need, not ability to pay.

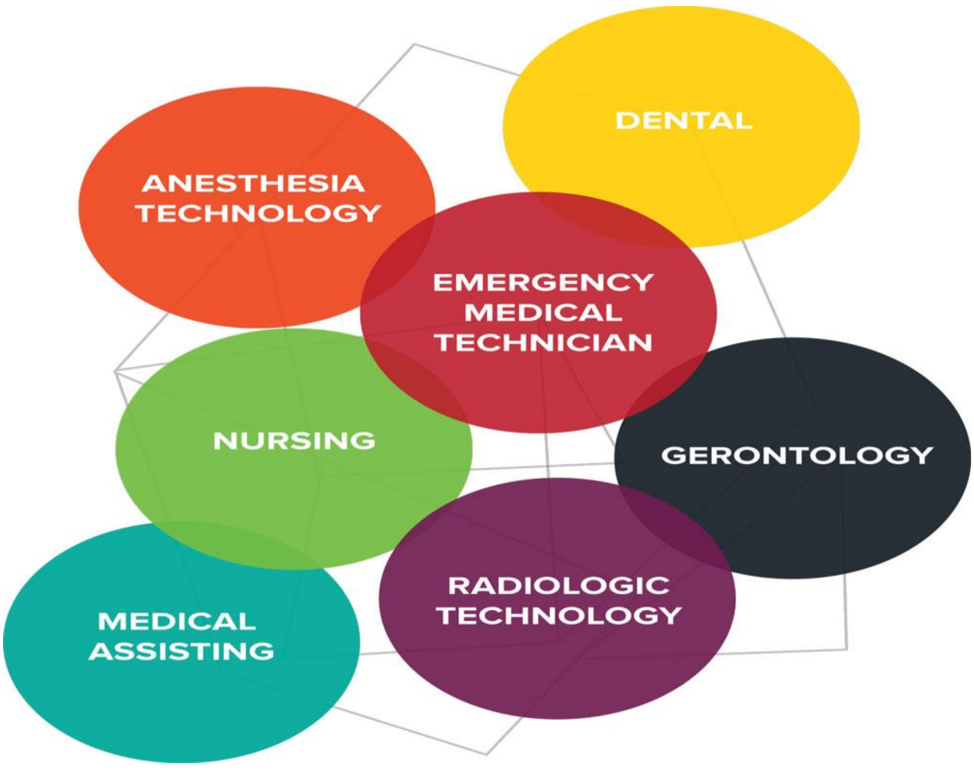
These three principles have guided the development of the NHS over more than half a century and remain. However, in July 2000, a full-scale modernization programme was launched and new principles added." The main aims of the additional principles are that the NHS will:

- Provide a comprehensive range of services.
- Shape its services around the needs and preferences of individual patients, their families and cares.
- Respond to the different needs of different populations.
- Work continuously to improve the quality of services and to minimize errors.
- Support and value its staff.
- Use public funds for healthcare devoted solely to NHS patients.
- Work with others to ensure a seamless service for patients.
- Help to keep people healthy and work to reduce health inequalities.
- Respect the confidentiality of individual patients and provide open access to the information about services, treatment and performance.

Exercise 4. Make up some dialogues from the information above.

Exercise 5. Transfer the given information from the passages onto a table.

№	Activity			
	Events	When	Where	Score
1.				



NATIONAL HEALTH SERVICE

The National Health Service (NHS) is the name commonly used to refer to the three publicly funded healthcare systems in Great Britain, collectively or individually, although only the health service in England uses the name "National Health Service" without further qualification.

The publicly-funded healthcare organization in Northern Ireland does not use the term "National Health Service", though is still sometimes referred to as the "NHS" as well.

Each system operates independently, and is politically accountable to the relevant devolved government of Scotland (Scottish Government), Wales (Welsh Assembly Government) and Northern Ireland (Northern Ireland Executive), and to the UK government for England. Originally, three services (for England and Wales, Scotland and Northern Ireland) were established by separate pieces of legislation and began operating on 5 July 1948. The Department of Health had responsibility for the NHS in England and Wales, the Scottish Office had responsibility for the NHS in Scotland and the Government of Northern Ireland had responsibility for public health in Northern Ireland.

Following the creation of a Welsh Office in 1964, responsibility for public health services in Wales was transferred to it from the Department of Health in 1969.

In turn, responsibility for NHS Wales and NHS Scotland transferred from the Welsh Office and Scottish Office to the Welsh Department of Health and Social Services and the Scottish Government Health Department, respectively, under devolution in 1999. Today, the Department of Health, Social Services and Public Safety has responsibility for health services in Northern Ireland.

There is no discrimination when a patient resident in one country of the United Kingdom requires treatment in another, except in the case of NHS abortions where women from Northern Ireland must pay for the service in mainland Britain. The consequent financial matters and paperwork of such inter-working are dealt with between the organizations involved and there is generally no personal involvement by the patient comparable to that which might occur when a resident of one EU member country receives treatment in another. The NHS is the publicly-funded healthcare system in England (though the term is also used to refer to the four national health services in the UK, collectively). The NHS provides healthcare to anyone normally resident in the United Kingdom with most services free at the point of use for the patient though there are charges associated with eye tests, dental care, prescriptions, and many aspects of personal care.

The NHS has agreed a formal constitution which sets out the legal rights and responsibilities of the NHS, its staff, and users of the service and makes additional non-binding pledges regarding many key aspects of its operations. The NHS provides the majority of healthcare in England, including primary care, in-patient care, long-term healthcare, ophthalmology and dentistry.

The National Health Service Act 1946 came into effect on 5 July 1948. Private health care has continued parallel to the NHS, paid for largely by private insurance: it is used by about 8% of the population, generally as an add-on to NHS services.

In the first decade of the 21st century the private sector started to be increasingly used by the NHS to increase capacity. According to the BMA a large proportion of the public opposed this move.

The NHS is largely funded from general taxation. The UK government department responsible for the NHS is the Department of Health, headed by the Secretary of State for Health.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise* 3. *Describe the history of National Health Service.

A national health service was one of the fundamental assumptions in the Beveridge Report which Arthur Greenwood, Labour's Deputy Leader and wartime Cabinet Minister with responsibility for post-war reconstruction had successfully pressed the cabinet to commission from economist and social reformer William Beveridge. The government accepted this assumption in February 1943, and after a White Paper in 1944 it fell to Clement Attlee's Labour government to create the NHS as part of the "cradle to grave" welfare-state reforms In the aftermath of World War II. Aneurin Bevan, the newly appointed Secretary of State for Health, was given the task of introducing the National Health Service.

Healthcare in the UK prior to the war had been a patchwork quilt of private, municipal and charity schemes though half of the area (not population) of Scotland was covered by public provision (the Highlands and Islands Medical Service).

Bevan now decided that the way forward was a national system rather than a system operated by regional authorities, to prevent inequalities between different regions.

He proposed that each resident of the UK would be signed up to a specific General Practice (GP) as the point of entry into the system, and would have access to any kind of treatment they needed without having to raise the money to pay for it. Doctors were initially opposed to Bevan's plan, primarily on the stated grounds that it reduced their level of independence.

Bevan had to get them onside, as, without doctors, there would be no health service. Being a shrewd political operator, Bevan managed to push through the radical health care reform measure by dividing and cajoling the opposition, as well as by offering lucrative payment structures for consultants. On this subject he stated, "I stuffed their mouths with gold".

On July 5, 1948, at the Park Hospital (now known as Trafford General Hospital) in Manchester, Bevan unveiled the National Health Service and stated, "We now have the moral leadership of the world". Dr A. J. Cronin's highly controversial novel *The Citadel*, published in 1937, had fomented extensive dialogue about the severe inadequacies of health care.

The author's innovative ideas were not only essential to the conception of the NHS, but in fact, his best-selling novels are even said to have greatly contributed to the Labour Party's victory in 1945.

Exercise 4. Define structure and organization.

The NHS in England is controlled by the UK government through the Department of Health (DH), which takes political responsibility for the service. Parliament has devolved management locally to ten Strategic Health Authorities (SHAs), which oversee all NHS operations, particularly the Primary Care Trusts, in their area. There are a number of types of regional NHS trust.

A feature of the NHS, distinguishing it from other public healthcare systems in Continental Europe, is that not only does it pay directly for health expenses, it also employs a large number of staff that provide them. In particular, nearly all hospital doctors and nurses in England are employed by the NHS and work in NHS-run hospitals. In contrast General Practitioners, dentists, optometrists (opticians) and other providers of local healthcare, are almost all self-employed, and contract their services back to the NHS. They may operate in partnership with other professionals, own and operate their own surgeries and clinics, and employ their own staff, including other doctors etc.

However, the NHS does sometimes provide centrally employed healthcare professionals and facilities in areas where there is insufficient provision by self-employed professionals. NHS workforce figures provided by the Department of Health include not only employees of NHS divisions but local authority social services workers. The full-time equivalent figure for 2005 was about 980,000 staff.

The NHS plays a unique role in the training of new doctors in the British Isles, with approximately 8000 places for student doctors each year, all of which are attached to an NHS University Hospital trust. After completing medical school these new doctors must go on to complete a two year foundation training programme.

Exercise 5. Translate the sentences into Russian.

1. You can see the hard core of the group on the photo. 2. There are too many hard core cases of poverty there. 3. The staff had a core of experts. 4. Dick's soul was troubled to the core. 5. If I but chose I could tell you something that would startle you to the very core.

Exercise 6. Choose the best variant.

1. The NHS states the following as _____ principles.
a) core b) essential c) basic d) fundamental
2. Good healthcare should be _____ to all, regardless of wealth.
a) fit b) apt c) expedient d) available
3. These three _____ have guided the development of the NHS
a) rules b) principles c) laws d) assumptions
4. A full-scale modernisation programme was _____and new principles added.
a) started b) launched c) initiate d) produce
5. The main _____ of the additional principles are the following.
a) aims b) goals c) intention d) purpose
6. They _____ a comprehensive range of services.
a) provide b) accommodate c) supply d) equip
7. They _____ to the different needs of different populations.
a) respond b) reply c) answer d) react
8. They _____ and value its staff
a) support b) provide c) supply d) equip
9. They help to keep people healthy and work to _____ health inequalities.
a) reduce b) diminish c) lower d) lessen
10. They _____ open access to information about services and treatment
a) provide b) accommodate c) supply d) equip

Exercise 7. Translate the words and phrases into Russian drawing up sentences with them.

Core, in the core of the city, the core of her beliefs, honest to the core, in core, to the core, core curriculum, core time, the Earth's core, to make up the core of an organisation, the core of a subject/a problem.

Exercise 8. Analyze the information, which is in the highlight, and use it in practice.

Healthcare in the United Kingdom is a devolved matter, meaning England, Northern Ireland, Scotland and Wales each has its own system of private and publicly-funded healthcare, together with alternative, holistic and complementary treatments. Public healthcare is provided to all UK permanent residents and is free at the point of need (being paid for from general taxation). Taken together, the World Health Organisation, in 2000, ranked the provision of healthcare in the United Kingdom as 15th best in Europe and 18th in the world.

The responsibility for healthcare in the United Kingdom lies with four executives; Her Majesty's Government for England and the Northern Ireland Executive, the Scottish Government and the Welsh Assembly Government. Each asserts governmental influence over its National Health Service but with each having different policies and priorities, a variety of differences exist between the systems.

Each country also has a private healthcare sector which is considerably smaller than its public equivalent, with provision of private healthcare acquired by means of private health insurance, funded as part of an employer funded healthcare scheme or paid directly by the customer, though provision can be restricted for those with conditions such as AIDS/HIV.

In 2002, expenditure on healthcare was budgeted to increase significantly over the ensuing 5 years to bring it closer to the European Union average. The UK spends around 8.4 % of its gross domestic product on healthcare, which is 0.5% below the Organization for Economic Co-operation and Development average and about one % below the average of the European Union.

HEALTHCARE IN ENGLAND

The majority of healthcare in England is provided by the National Health Service (NHS), England's publicly funded healthcare system. Responsibility for healthcare in England lies with the Department of Health which spends most of its budget on the NHS, providing its services, without charge at the point of use, to patients who are normally resident in the UK, though there are charges associated with eye tests, dental care, prescriptions, and many aspects of personal care.

Health care is not micromanaged by government as responsibility for managing the delivery of health care services is devolved to ten Strategic Health Authorities which are responsible for maintaining quality and developing plans for improvement in their local areas, and below this to locally accountable trusts and other bodies.

Social care services are a shared responsibility with the local NHS and the local government Directors of Social Services under the guidance of the DH. Since the National Health Service Act 1946 came into effect on 5 July 1948, private healthcare has continued parallel to the NHS, paid for largely by private insurance, though it is used by less than 8% of the population.

In recent years, the private sector has been used to increase NHS capacity despite some evidence that a large proportion of the public oppose such involvement. There are two main kinds of trusts in the NHS reflecting purchaser/provider roles: *commissioning trusts* are responsible for examining local needs and negotiating with providers to provide health care services to the local population, and *provider trusts* which are NHS bodies delivering health care service. Commissioning trusts negotiate service delivery with providers that may be NHS bodies or private entities. They will be involved in agreeing major capital and other health care spending projects in their region.

By far the most known and most important type of commissioning trust is the Primary Care Trust or PCT. This commissions (or purchases) services including general practice physician services (most of whom are private businesses working under exclusive contract to the NHS), community nursing, local clinics and mental health service. For most people, the majority of health care is delivered in a primary health care setting. Provider trusts are care deliverers, the main examples being the hospital trusts & the ambulance trusts, which spend the money allocated to them by the commissioning trusts. Because hospitals tend to provide more complex and specialized care, they receive the lion's share of NHS funding. The hospital trusts own assets (such as hospitals and the equipment in them) purchased for the nation and held in trust for them.

Commissioning has been extended to the very lowest level enabling ordinary doctors who identify a need in their community to commission services to meet that need. Primary care is delivered by a wide range of independent contractors such as GPs, dentists, pharmacists and optometrists and is the first point of contact for most people. Secondary care (sometimes termed acute health care) can be either elective care or emergency care and providers may be in the public or private sector, though the majority of secondary care happens in NHS owned facilities.

The NHS Constitution covers the rights and obligations of patients and staff of the NHS, many of which are legally enforceable. The NHS has a high level of popular public support within the country: an independent survey conducted in 2016 found that users of the NHS often expressed very high levels satisfaction about their personal experience of the medical services they received: 92% of hospital in-patients, 87% of GP users, 87% of hospital outpatients, and 70% of Accident and Emergency department users.

However, only 67% of those surveyed agreed with the statement "My local NHS is providing me with a good service", and only 51% agreed with the statement "The NHS is providing a good service. Satisfaction in successive surveys has noted high satisfaction across all patient groups, especially recent inpatients, and user satisfaction is notably higher than that of the general public.

The report found that most highly recalled sources of information on the NHS are perceived to be the most critical.

The national press was seen to be the most critical (64%), followed by local press (54%) and TV or radio (51%) compared to just 13% saying the national press is favourable). The national press was reported as being the least reliable source of information (50% reporting it to be not very or not at all reliable, compared to 36% believing the press was reliable). Newspapers were reported as being less favorable and also less reliable than the broadcast media. The most reliable sources of information were considered to be leaflets from GPs and information from friends.

There is some relatively minor sector crossover between public and private provision in some parts of England with it possible for some NHS patients to be treated in private healthcare facilitities and some NHS facilities let out to the private sector for privately funded treatments or for pre- and post-operative care. This depends on policy and contractual arrangements in each local area.

One of the downsides of surgery in a private hospital is that they tend to manage only routine operations and if an unexpected emergency arises, the patient may require transfer to an NHS hospital as very few private hospitals have a level 3 critical care unit (or intensive therapy unit) that can handle complications resulting from surgery. This takes time, puts the patient at more risk than if the same procedure had happened in the NHS, and costs the NHS money. It was found that in England and Wales in 1999, there were 749 emergency transfers from private hospitals to NHS hospitals.

Healthcare in Northern Ireland & Scotland & Wales

The majority of healthcare in Northern Ireland is provided by Health and Social Care in Northern Ireland. Though this organisation does not use the term "National Health Service", it is still sometimes referred to as the "NHS" The majority of healthcare in Scotland is provided by NHS Scotland, Scotland's system of publicly funded healthcare that was created in 1948 at the same time as the NHS south of the border.

It remains a separate body from the other public health systems in the UK although this is often not realised by patients when "cross-border" or emergency care is involved due to the level of co-operation and co-ordination. The majority of healthcare in Wales is provided by NHS Wales.

This body was originally formed as part of the same NHS structure for England and Wales created by the National Health Service Act 1946 but powers over the NHS in Wales came under the Secretary of State for Wales in 1969 and, in turn, responsibility for NHS Wales was passed to the Welsh Assembly and the Welsh Assembly Government under devolution in 1999.

Ambulance services

Each public healthcare system provides free ambulance services for emergencies, when patients need the specialist transport only available from ambulance crews or when patients are not fit to travel home by public transport. These services are supplemented when necessary by the voluntary ambulance services. In addition, patient transport services by air are provided by the Scottish Ambulance Service and by county or regional air ambulance trusts (sometimes operated jointly with local police helicopter services) throughout England and Wales. In specific emergencies, emergency air transport is also provided by naval, military and air force aircraft of whatever type might be appropriate or available on each occasion.

Dentistry

Each NHS system provides dental services through private dental practises and dentists can only charge NHS patients at set rates (the rates vary among countries). Patients opting to be treated privately do not receive any NHS funding for the treatment. About half of the income of dentists in England comes from work sub-contracted from the NHS, not all dentists choose to do NHS work.

General practitioners & hospitals

Each NHS system uses General Practitioners (GPs) to provide primary healthcare for patients and to make referrals to further services as necessary. Hospitals are used to provide more specialist services, including diagnostic and surgical.

Specialist mental hospitals exist to care for patients with psychiatric illnesses. Apart from referral by a general practitioner, access to hospital services can be obtained at Accident & Emergency (A&E) departments. Each NHS system uses pharmacies to supply prescription drugs.

Pharmacies (other than those within hospitals) are privately owned but have contracts with the relevant health service. Polyclinics are being trialled in London and in other suburban areas and, if successful, may be rolled out across England. Whereas the UK Government is expanding the role of the private sector within the NHS in England, the current Scottish government is actively reducing the role of the private sector within public healthcare in Scotland.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Read the article and analyze emergency medical services.

Public ambulance services across the UK are required by law to respond to 4 types of requests for care, which are:

- emergency calls (via the 999 system);
- doctor's urgent admission requests;
- high dependency and urgent inter-hospital transfers;
- major incidents.

Ambulance trusts and services may also undertake non-urgent patient transport services on a commercial arrangement with their local hospital trusts or health boards, or in some cases on directly funded government contracts. This is an area where an increasing amount of private firms are taking business away from the trusts. Emergency ambulance work in all NHS bodies and most voluntary and private firms is based on the guidance published by the Joint Royal Colleges of medicine Ambulance Liaison Committee (JRCALC).

Emergency medical services are provided through local ambulance services, known in England and Wales as trusts. Each service in England is specific to a one or more local authority areas, and so the country is divided across a number of ambulance services, in a similar way to the Police.

There are twelve ambulance "Trusts", with boundaries generally following those of the regional government offices. The ambulance services have been increasingly busy, with a significant increase in calls in the last two decades. Whilst ambulance cover in Scotland was originally provided by a combination of the British Red Cross and St. Andrews Ambulance until 1974, it is a Special Health Board funded directly by the Health Department of the Scottish Government.

In 2006 the service responded to over 520,000 emergency calls. The national headquarters are in Edinburgh and there are five divisions within the Service.

Northern Ireland & Wales

The Northern Ireland Ambulance Service (NIAS) is the ambulance service that serves the whole of Northern Ireland, and was established in 1995 by parliamentary order. As with other ambulance services in the UK, it does not charge its patients directly for its services, but instead receives funding through general taxation. It responds to medical emergencies in Northern Ireland with the 270 plus ambulances at its disposal. The Service employs approximately 1,044 staff based across 32 stations & sub-stations, four Control Centers and a Regional Training Centre.

The Welsh Ambulance Service NHS Trust was established on 1 April 1998, and has 2,500 staff providing ambulance and related services to the 2.9 million residents of Wales. Its headquarters is located at H.M.Stanley Hospital, St. Asaph, Denbighshire and it is divided into three regions.

Exercise 3. Digest the score of the information briefly in English.

Exercise 4. Answer the questions.

1. What is public ambulance services across the UK required? 2. Whom may ambulance trusts and services undertake? 3. How is emergency medical services provided? 4. How many ambulance "Trusts" are there? 5. How does The Northern Ireland Ambulance Service differ from the English one?

Exercise 5. Define clinical response.

Within hospital settings, an adequate staff is generally present to deal with the average emergency situation. Emergency medicine physicians have training to deal with most medical emergencies, and maintain CPR and ACLS certifications. In disasters or complex emergencies, most hospitals have protocols to summon on-site and off-site staff rapidly. Irrespective of the nature of the emergency, adequate blood pressure and oxygenation are required before the cause of the emergency can be eliminated. Possible exceptions include the clamping of arteries in severe hemorrhage. While the golden hour (medicine) is a trauma treatment concept, two emergency medical conditions have well-documented time-critical treatment considerations: stroke and myocardial infarction (heart attack).

In the case of stroke, there is a window of three hours within which the benefit of clot-busting drugs outweighs the risk of major bleeding. In the case of a heart attack, rapid stabilization of fatal arrhythmias can prevent sudden cardiac death. There is a direct relationship between time-to-treatment and the success of reperfusion (restoration of blood flow to the heart), including a time dependent reduction in the mortality and morbidity.

Exercise 6. Translate the sentences into Russian.

1. His wife called for an ambulance when he collapsed. 2. He was taken to hospital by ambulance. 3. He worked as an ambulance man 5 years ago. 4. The ambulance shuttle was organized in China after a major earthquake. 5. Three is an ambulance station in each town district. 6. This is a jeep ambulance. 7. They used a medical ambulance. 8. Call in an ambulance!. 9. Sometimes they use an air ambulance. 10. You can see a flying ambulance. 11. In this region they use an ambulance boat. 12. There are a lot of modern ambulance cars and lorries in our country. 13. You are an ambulance chaser. 14. There are a great many people in an ambulance sphere: ambulance men, ambulance drivers, attendants, emergency medical technicians. 15. In our village there is only an ambulance room. 16. The ambulance service is not so developed in our country. 17. An ambulance situation is very important. 18. He has been working as an ambulance surgeon for 4 years.

Exercise 7. Describe the score of private ambulance services.

Private ambulance services are becoming more common in the UK, performing a number of roles, including providing medical cover at large events, either alongside, or instead of the voluntary sector providers. Some organisers use a private firm instead of a voluntary ambulance service because of wider availability during the week or for a wider range of skills, such as provision of qualified Paramedics. Some companies have been contracted to provide additional emergency crews and vehicles to supplement the core NHS staff at busy times, with a quarter of the UK ambulance trusts contracting private companies to front line work.

The main voluntary ambulance providers are the British Red Cross and St. John Ambulance, which have been providing emergency medical cover in the UK for many years, including active service in both World Wars (pre-dating the existence of any government organized service), and along with St. Andrews Ambulance ran statutory ambulance services under contract to the government until a reorganization in 1974. The primary activity of both organizations in relation to ambulances is the provision of covers at events as an extension of their first aid contract. This service is most often called on during major incidents (e.g. the 7 July 2005 London bombings), when there is a high level of staff absence or when there is an unusually high call volume, although in some areas, voluntary crews are regularly used to supplement full time trust cover. The **ambulatory** is the covered passage around a cloister. The term is sometimes applied to the procession way around the east end of a cathedral or large church and behind the high altar. Along the ambulatory, there are small chapels (chantries). This modification by Romanesque architects allowed visitors to move freely around the altar without disturbing the monks' devotions. Ambulatory care is any medical care delivered on an *outpatient* basis. Many medical conditions do not require hospital admission and can be managed without admission to a hospital.

WORLD HEALTH ORGANIZATION

World Health Organization

Flag of the World Health Organization

Org type	Specialized agency of the United Nations
Acronyms	WHO
Status	active
Established	7 April 1948
Headquarters	Geneva, Switzerland
Parent org	ECOSOC

Constitution & history

The WHO's constitution states that its objective "is the attainment by all peoples of the highest possible level of health." Its major task is to combat disease, especially key infectious diseases, and to promote the general health of the people of the world. The World Health Organization (WHO) is one of the original agencies of the United Nations, its constitution formally coming into force on the first World Health Day, (7 April 1948), when it was ratified by the 26th member state.

Prior to this its operations, as well as the remaining activities of the League of Nations Health Organization, were under the control of an Interim Commission following an International Health Conference in the summer of 1946. The transfer was authorized by a Resolution of the General Assembly.

The epidemiological service of the French *Office International d'Hygiène Publique* was incorporated into the Interim Commission of the World Health Organization on 1 January 1947.

As well as coordinating international efforts to monitor outbreaks of infectious diseases, such as SARS, malaria, swine flu, and AIDS the WHO also sponsors programs to prevent and treat such diseases.

The WHO supports the development and distribution of safe and effective vaccines, pharmaceutical diagnostics, and drugs. After over 2 decades of fighting smallpox, the WHO declared in 1980 that the disease had been eradicated - the first disease in history to be eliminated by human effort. The WHO aims to eradicate polio within the next few years.

The organization has already endorsed the world's first official HIV/AIDS Toolkit for Zimbabwe (from 3 October 2006), making it an international standard. In addition to its work in eradicating disease, the WHO also carries out various health-related campaigns to boost the consumption of fruits and vegetables worldwide and to discourage tobacco use. Experts met at the WHO headquarters in Geneva in February, 2007, and reported that their work on pandemic influenza vaccine development had achieved encouraging progress. More than 40 clinical trials have been completed or are ongoing.

Most have focused on healthy adults. Some companies, after completing safety analyses in adults, have initiated clinical trials in the elderly and in children. All vaccines so far appear to be safe and well-tolerated in all age groups tested. The WHO also promotes the development of capacities in Member States to use and produce research that addresses national needs, by bolstering national health research systems and promoting knowledge translation platforms. WHO and its regional offices are working to develop regional policies on research for health – the first one being the Regional Office for the Americas PAHO/AMRO that had its Policy on Research for Health approved in September 2009 by its 49th Directing Council Document CD 49.10. WHO conducts some research; for example, whether the electromagnetic field surrounding cell phones has an impact on health. Some of this work can be controversial, as illustrated by the April, 2003, joint WHO/FAO report, which recommended that sugar should form no more than 10% of a healthy diet.

This report led to lobbying by the sugar industry against the recommendation, to which the WHO/FAO responded by including in the report the statement "The Consultation recognized that a population goal for free sugars of less than 10% of total energy is controversial", but also stood by its recommendation based upon its own analysis of scientific studies. A health care provider or health professional is an organization or person who delivers proper health care in a systematic way professionally to any individual in need of health care services.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Describe the delivery of services.

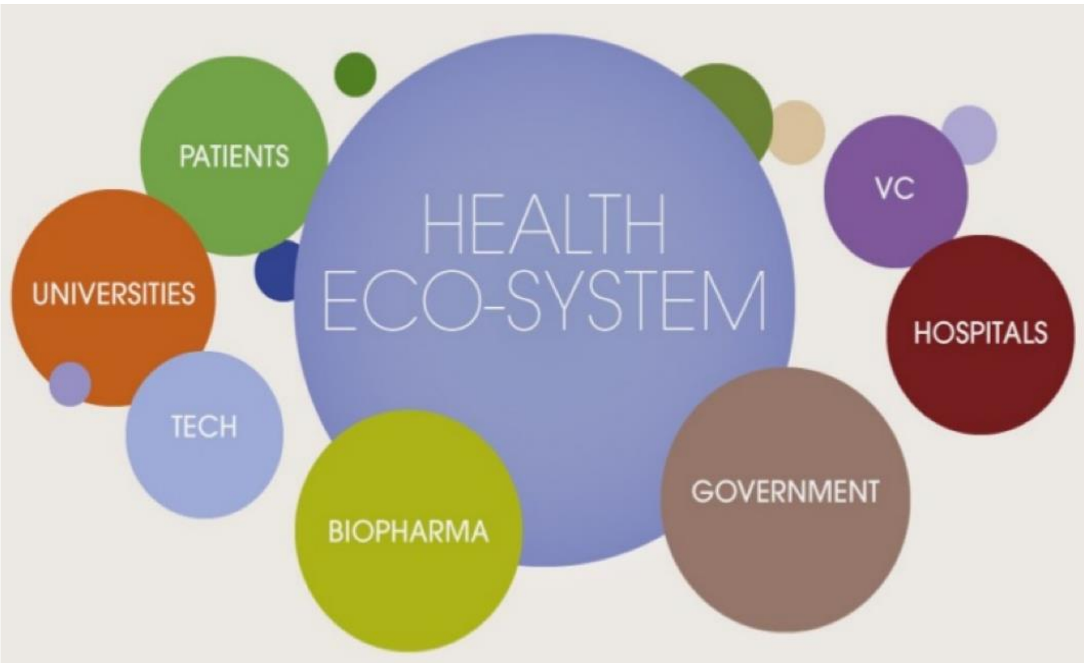
The health care industry includes the delivery of health services by health care providers.

Usually such services are paid for by the patient or by the patient's insurance company; although they may be government-financed (such as the NHS in the UK) or delivered by charities or volunteers, particularly in poorer countries. The structure of health care charges can also vary dramatically among countries. For instance, unlike the USA, Chinese hospital charges tend toward 50% for drugs, another major % age for equipment, and a small % age for health care professional fees.

There are many ways of providing health care in the modern world. The most common way is face-to-face delivery, where care provider and patient see each other "in the flesh". This is what occurs in general medicine in most countries. However, health care is not always face-to-face; with modern telecommunications technology, *in absentia* health care is becoming more common. This could be when practitioner and patient communicate over the phone, video conferencing, the internet, email, text messages, or any other form of non-face-to-face communication.

Exercise 3. Give the explanation of the notion «medical tourism».

Medical tourism (medical travel, health tourism or global health care) is a term initially coined by travel agencies and the mass media to describe the rapidly-growing practice of traveling across international borders to obtain health care. Such services typically include elective procedures as well as complex specialized surgeries such as joint replacement (knee/hip), cardiac surgery, dental surgery, and cosmetic surgeries. However, virtually every type of health care, including psychiatry, alternative treatments, convalescent care and even burial services are available. As a practical matter, providers and customers commonly use informal channels of communication-connection-contract, and in such cases this tends to mean less regulatory or legal oversight to assure quality and less formal recourse to reimbursement or redress, if needed.



Exercise 4. Analyze the facts and figures in the text.

Over 50 countries have identified medical tourism as a national industry.However, accreditation and other measures of quality vary widely across the globe, and there are risks and ethical issues that make this method of accessing medical care controversial. Some destinations may become hazardous or even dangerous for medical tourists to contemplate. The health care industry is one of the world's largest and fastest-growing industries. Consuming over 10 % of gross domestic product of most developed nations, health care can form an enormous part of a country's economy.

In 2003, health care costs paid to hospitals, physicians, nursing homes, diagnostic laboratories, pharmacies, medical device manufacturers and other components of the health care system, consumed 15.3 % of the GDP of the United States, the largest of any country in the world.

For the USA, the health share of gross domestic product (GDP) is expected to hold steady in 2006 before resuming its historical upward trend, reaching 19.6 % of GDP by 2016. In 2001, for the OECD countries the average was 8.4 % with the United States (13.9%), Switzerland (10.9%), and Germany (10.7%) being the top three. US health care expenditures totaled US$2.2 trillion in 2006. According to Health Affairs, USD$7,498 will be spent on every woman, man and child in the United States in 2007, 20 % of all spending.

Costs are projected to increase to $12,782 by 2016. China has implemented a long-term transformation of its health care industry, beginning in the 1980's. Over the first 25 years of this transformation, government contributions to health care expenditures have dropped from 36% to 15% , with the burden of managing this decrease falling largely on patients. Over this period, a small proportion of state-owned hospitals have been privatized. As an incentive to privatization, foreign investment in hospitals – up to 70% ownership – has been encouraged.

Exercise 5. Choose the keywords that best convey the gist of the information.

Exercise 6. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 7. Translate the words and phrases into Russian drawing up sentences with them.

Health; bad (broken, failing, feeble, fragile, frail, ill, poor) health; good (robust) health; holistic (mental) health; physical health; to be in bad (poor, ill) health; to enjoy good health; to promote (good) health; to recover (regain) one's health; to ruin (undermine) smb.'s health; health protection; good health is above wealth; not for one's health; damage to health; mental health; promotion of health; to raise the level of health of the country; environmental health; economic health.

Exercise 8. Render the History of public health shortly in English.

In some ways, public health is a modern concept, although it has roots in antiquity. From the beginnings of human civilization, it was recognized that polluted water and lack of proper waste disposal spread communicable diseases (theory of miasma). Early religions attempted to regulate behavior that specifically related to health, from types of food eaten, to regulating certain indulgent behaviors, such as drinking alcohol or sexual relations.

The establishment of governments placed responsibility on leaders to develop public health policies and programs in order to gain some understanding of the causes of disease and thus ensure social stability prosperity, and maintain order.

PUBLIC HEALTH

Public health is "the science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals." It is concerned with threats to the overall health of a community based on population health analysis. The population in question can be as small as a handful of people or as large as all the inhabitants of several continents (for instance, in the case of a pandemic).

Public health is typically divided into epidemiology, biostatistics and health services. Environmental, social, behavioral, and occupational health are also important subfields. There are 2 distinct characteristics of public health – it deals with:

- preventive rather than curative aspects of health;
- population-level rather than individual-level health issues.

The focus of public health intervention is to prevent rather than treat a disease through surveillance of cases and the promotion of healthy behaviors.

In addition to these activities, in many cases treating a disease may be vital to preventing it in others, such as during an outbreak of an infectious disease. Hand washing, vaccination programs and distribution of condoms are examples of public health measures. The goal of public health is to improve lives through the prevention and treatment of disease. The United Nations' World Health Organization defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." The focus of a public health intervention is to prevent rather than treat a disease through surveillance of cases and the promotion of healthy behaviors.

In addition to these activities, in many cases treating a disease can be vital to preventing its spread to others, such as during an outbreak of infectious disease or contamination of food or water supplies. Vaccination programs and distribution of condoms are examples of public health measures.

Most countries have their own government public health agencies, sometimes known as ministries of health, to respond to domestic health issues.

The United States Public Health Service (PHS), led by the Surgeon General of the United States, and the Centers for Disease Control and Prevention, headquartered in Atlanta, are involved with several international health activities, in addition to their national duties.

There is a vast discrepancy in access to health care and public health initiatives between developed nations and developing nations. In the developing world, public health infrastructures are still forming. There may not be enough trained health workers or monetary resources to provide even a basic level of medical care and disease prevention. As a result, a large majority of disease and mortality in the developing world results from and contributes to extreme poverty.

Many diseases are preventable through simple, non-medical methods. For example, research has shown that the simple act of hand washing can prevent many contagious diseases. Public health plays an important role in disease prevention efforts in both the developing world and in developed countries, through local health systems and through international non-governmental organizations.

The two major postgraduate professional degrees related to this field are the Master of Public Health (MPH) or the (much rarer) Doctor of Public Health (DrPH). Many public health researchers hold PhDs in their fields of specialty, while some public health programs confer the equivalent Doctor of Science degree instead.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Answer the questions.

1. What is public health like? 2. What is it concerned with? 3. What is it divided into? 4. What is the focus of public health intervention? 5. Most countries have their own government public health agencies, haven't they? 6. Where is the USA PHS headquartered? 7. Is there a vast discrepancy in access to health care & public health initiatives between developed & developing nations?

Exercise 3. Translate the words and phrases into Russian drawing up sentences with them.

Bill of health (health bill); health and accident insurance; health inspection; health (medical) insurance; health services; public health; national health; occupational health; workers' health; community health; monitoring of health; health activities; health administration; health advisory; health aids; health and beauty aids; health and fitness centre; bad (broken, failing, feeble, fragile, frail, ill, poor) health; tender health; good / robust health; mental health; physical health; to be in bad / poor / ill health; to enjoy good health; to promote (good) health; to recover / regain one's health; to ruin / undermine smb.'s health; health protection (public health); community health; health authorities; to drink smb.'s health; poor economic health; good health is above wealth; not for one's health; damage to health; promotion of health; to raise the level of health of the country; environmental health; occupational health; labour health; health activities; health administration.

Exercise 4. Name early public health interventions.

By Roman times, it was well understood that proper diversion of human waste was a necessary tenet of public health in urban areas. The Chinese developed the practice of variolation following a smallpox epidemic around 1000 B.C. An individual without the disease could gain some measure of immunity against it by inhaling the dried crusts that formed around lesions of infected individuals.

Children were protected by inoculating a scratch on their forearms with the pus from a lesion.

This practice was not documented in the West until the early-1700s, and was used on a very limited basis. The practice of vaccination did not become prevalent until the 1820s, following the work of Edward Jenner to treat smallpox.

During the 14th century Black Death in Europe, it was believed that removing bodies of the dead would further prevent the spread of the bacterial infection. This did little to stem the plague, however, which was most likely spread by rodent-borne fleas. Burning parts of cities resulted in much greater benefit, since it destroyed the rodent infestations.

The development of quarantine in the medieval period helped mitigate the effects of other infectious diseases. However, according to Michel Foucault, the plague model of governmentality was later controverted by the cholera model. A Cholera pandemic devastated Europe between 1829 and 1851, and was first fought by the use of what Foucault called "social medicine", which focused on flux, circulation of air, location of cemeteries, etc.

All those concerns, born of the miasma theory of disease, were mixed with urbanistic concerns for the management of populations, which Foucault designated as the concept of "biopower".

The German conceptualized this in the *Polizeiwissenschaft* ("Science of police"). The science of epidemiology was founded by John Snow's identification of a polluted public water well as the source of an 1854 cholera outbreak in London. Dr. Snow believed in the germ theory of disease as opposed to the prevailing miasma theory. Although miasma theory correctly teaches that disease is a result of poor sanitation, it was based upon the prevailing theory of spontaneous generation.

Germ theory developed slowly: despite Anton van Leeuwenhoek's observations of Microorganisms, in the year 1680, the modern era of public health did not begin until the 1880s, with Louis Pasteur's germ theory and production of artificial vaccines.

Exercise 5. Make up some dialogues from the information above.

Exercise 6. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 7. Explain the essentials of Public health programs.

Today, most governments recognize the importance of public health programs in reducing the incidence of disease, disability, and the effects of aging, although public health generally receives significantly less government funding compared with medicine. In recent years, public health programs providing vaccinations have made incredible strides in promoting health, including the eradication of smallpox, a disease that plagued humanity for thousands of years.

An important public health issue facing the world currently is HIV/AIDS. Antibiotic resistance is another major concern, leading to the reemergence of diseases such as Tuberculosis.

Another major public health concern is diabetes. In 2006, according to the World Health Organization, at least 171 million people worldwide suffered from diabetes. Its incidence is increasing rapidly, and it is estimated that by the year 2030, this number will double. A controversial aspect of public health is the control of smoking. Many nations have implemented major initiatives to cut smoking, such as increased taxation and bans on smoking in some or all public places.

Proponents argue by presenting evidence that smoking is one of the major killers in all developed countries, and that therefore governments have a duty to reduce the death rate, both through limiting passive (second-hand) smoking and by providing fewer opportunities for smokers to smoke. Opponents say that this undermines individual freedom and personal responsibility (often using the phrase nanny state in the UK), and worry that the state may be emboldened to remove more and more choice in the name of better population health overall. However, proponents counter that inflicting disease on other people via passive smoking is not a human right, and in fact smokers are still free to smoke in their own homes. There is a link between public health and veterinary public health which deals with zoonotic diseases, diseases that can be transmitted from animals to humans.

Exercise 8. Digest the information briefly in English.

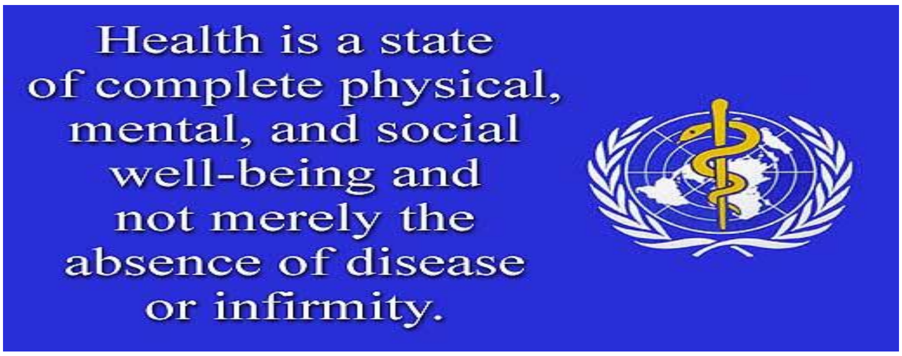
Exercise 9. Expound the score of life expectancy.

Life expectancy is the expected (in the statistical sense) number of years of life remaining at a given age. It is denoted by e_x, which means the average number of subsequent years of life for someone now aged *x*, according to a particular mortality experience. In technical literature, this symbol means the average number of complete years of life remaining, ie excluding fractions of a year.

The corresponding statistic including fractions of a year, i.e. the normal meaning of life expectancy, has a symbol with a small circle over the *e*. The term is most often used in the human context, but is also used in plant or animal ecology; it is calculated by the analysis of life tables.

The term life expectancy may also be used in the context of manufactured objects although the related term shelf life is used for consumer products and the term mean time to breakdown is used in engineering literature. Life expectancy is heavily dependent on the criteria used to select the group.

In countries with high infant mortality rates, the life expectancy at birth is highly sensitive to the rate of death in the first few years of life. In these cases, another measure such as life expectancy at age 5 (e_5) can be used to exclude the effects of infant mortality to provide a simple measure of overall mortality rates other than in early childhood. Life expectancy is usually calculated separately for males and females.



Exercise 10. Define the main traits of modern public health.

Other public health interventions include latrinization, the building of sewers, the regular collection of garbage followed by incineration or disposal in a landfill, providing clean water and draining standing water to prevent the breeding of mosquitos.

As the prevalence of infectious diseases in the developed world decreased through the 20th century, public health began to put more focus on chronic diseases such as cancer and heart disease. An emphasis on physical exercise was reintroduced.

In America, public health worker Dr. Sara Josephine Baker lowered the infant mortality rate using preventative methods. She established many programs to help the poor in New York City keep their infants healthy. Dr. Baker led teams of nurses into the crowded neighborhoods of Hell's Kitchen and taught mothers how to dress, feed, and bathe their babies. After World War I many states and countries followed her example in order to lower infant mortality rates.

During the 20th century, the dramatic increase in average life span is widely credited to public health achievements, such as vaccination programs and control of infectious diseases, effective safety policies such as motor-vehicle and occupational safety, improved family planning, fluoridation of drinking water, anti-smoking measures, and programs designed to decrease chronic disease.

Meanwhile, the developing world remained plagued by largely preventable infectious diseases, exacerbated by malnutrition and poverty. Front-page headlines continue to present society with public health issues on a daily basis:

- emerging infectious diseases such as SARS, making its way from China to Canada and the United States; prescription drug benefits under public programs such as Medicare;
- the increase of HIV-AIDS among young heterosexual women and its spread in South Africa;
- the increase of childhood obesity and the concomitant increase in type II diabetes among children;
- the impact of adolescent pregnancy; and the ongoing social, economic and health disasters related to the 2004 Tsunami and Hurricane Katrina in 2005. These are all ongoing public health challenges. Since the 1980s, the growing field of population health has broadened the focus of public health from individual behaviors and risk factors to population-level issues such as inequality, poverty, and education. Modern public health is often concerned with addressing determinants of health across a population, rather than advocating for individual behaviour change. There is a recognition that our health is affected by many factors including where we live, genetics, our income, our educational status and our social relationships – these are known as "social determinants of health." A social gradient in health runs through society, with those that are poorest generally suffering the worst health. However even those in the *middle classes* will generally have worse health outcomes than those of a higher social stratum. The *new* public health seeks to address these health inequalities by advocating for population-based policies that improve health in an equitable manner.

Exercise* 11. *Explain lifespan variation over time.

Humans live on average 39.5 years in Swaziland and 81 years in Japan, although Japan's recorded life expectancy may have been very slightly increased by counting many infant deaths as stillborn. The oldest confirmed recorded age for any human is 122 years, though some people are reported to have lived longer. This is referred to as the "maximum life span", which is the upper boundary of life, the maximum number of years a human can live. In many instances life expectancy varied considerably according to class and gender. Sometimes, mainly in the past, life expectancy increased during the years of childhood, as the individual survived the high mortality rates then associated with childhood. A pre-20th century individual who lived past the teenage years could expect to live to an age comparable to the life expectancy of today.

Exercise 12. Characterize education and training in the field of medicine.

The Welch-Rose Report of 1915 has been viewed as the basis for the critical movement in the history of the institutional schism between public health and medicine because it led to the establishment of schools of public health supported by the Rockefeller Foundation. The report was authored by William Welch, founding dean of the Johns Hopkins Bloomberg School of Public Health, and Wycliffe Rose of the Rockfeller Foundation. The report focused more on research than practical education. Some have blamed the Rockfeller Foundation's 1916 decision to support the establishment of schools of public health for creating the schism between public health and medicine and legitimizing the rift between medicine's laboratory investigation of the mechanisms of disease and public health's nonclinical concern with environmental and social influences on health and wellness.

A year following the report, the Johns Hopkins School of Hygiene and Public Health was founded in 1916. By 1922, schools of public health were established in Columbia, Harvard and Yale universities. By 1999 there were twenty nine schools of public health enrolling around fifteen thousand students. Over the years, the types of students and training provided have also changed. In the beginning, students who enrolled in public health schools had already obtained a medical degree.

However, in 1978, 69% of students enrolled in public health schools had only a bachelor's degree. Public health school training had evolved from a second degree for medical professionals to a primary public health degree with a focus on the six core disciplines of biostatistics, epidemiology, health services administration, health education, behavioral science and environmental science.

Schools of public health offer a variety of degrees which generally fall into two categories: professional or academic. Professional degrees are oriented towards practice in public health settings.

The Master of Public Health (M.P.H.), Doctor of Public Health (Dr.PH.) and the Master of Health Care Administration (M.H.A.) are examples of degrees which are geared towards people who want careers as practitioners of public health in health departments, managed care and community-based organizations, hospitals and consulting firms among others. Master of Public Health (MPH) degrees broadly fall into two categories, those that put more emphasis on an understanding of epidemiology and statistics as the scientific basis of public health practice and those that include a more eclectic range of methodologies.

Academic degrees are more oriented towards those with interests in the scientific basis of public health and preventive medicine who wish to pursue careers in research, university teaching in graduate programs, policy analysis and development, and other high-level public health positions.

Examples of academic degrees are the Master of Science (M.S.), Doctor of Philosophy (Ph.D.), and Doctor of Science (Sc.D.). The doctoral programs are distinct from the M.P.H. and other professional programs by the addition of advanced coursework and the nature and scope of a dissertation research project. The Association of Schools of Public Health represents Council on Education for Public Health (CEPH) accredited schools of public health in the United States, Puerto Rico, and Mexico. Delta Omega is the honorary society for graduate studies in public health. The society was founded in 1924 at the Johns Hopkins School of Hygiene and Public Health. Currently, there are approximately 50 chapters throughout the United States and Puerto Rico.

Humans by Era	Average lifespan at birth (years)	Comment
Upper Paleolithic	33	At age 15: 39 (to age 54)
Neolithic	20	
Bronze Age	18	
Bronze age, Sweden	40-60	
Classical Greece	20-30	
Classical Rome	20-30	
Pre-Columbian North America	25-30	
Medieval Islamic Caliphate	35+	The average lifespans of the elite class were 59-84.3 years in the Middle East and 69-75 in Islamic Spain.
Medieval Britain	20-30	
Early 20th Century	30-40	
Current world average	65	2009 est.

During the Industrial Revolution, the life expectancy of children increased dramatically.

The %age of children born in London who died before the age of five decreased from 74.5% in 1730-1749 to 31.8% in 1810-1829. Public health measures are credited with much of the recent increase in life expectancy.

During the 20th century, the average lifespan in the United States increased by more than 30 years, of which 25 years can be attributed to advances in public health. In order to assess the quality of these additional years of life, "healthy life expectancies" have been calculated for the last 30 years.

Since 2001, the World Health Organization publishes statistics called Healthy life expectancy (HALE), defined as the average number of years that a person can expect to live in "full health", excluding the years lived in less than full health due to disease and/or injury. Since 2004, Eurostat publishes annual statistics called Healthy Life Years (HLY) based on reported activity limitations.

There are great variations in life expectancy worldwide, mostly caused by differences in public health, medical care and diet from country to country. Much of the excess mortality (higher death rates) in poorer nations is due to war, starvation, and diseases (AIDS, Malaria, etc.).

Over the past 200 years, countries with Black or African populations have generally not had the same improvements in mortality rates that have been enjoyed by populations of European origin.

Even in countries with a majority of White people, such as USA, England, and France, Black people tend to have shorter life expectancies than their White counterparts (although often the statistics are not analyzed by race). For example, in the U.S.

White Americans are expected to live until age 78, but African Americans only until age 71. Climate may also have an effect, and the way data is collected may also influence the figures. According to the U.S. Census Bureau, Andorra has the world's longest life expectancy of 83.5 years.

There are significant differences in life expectancy between men and women in most countries, with women typically outliving men by around five years. Economic circumstances affect life expectancy. In the UK, life expectancy in the wealthiest areas is several years longer than in the poorest areas.

This may reflect factors such as diet and lifestyle as well as access to medical care. It may also reflect a selective effect: people with chronic life-threatening illnesses are less likely to become wealthy or to reside in affluent areas. In Glasgow the disparity is among the highest in the world with life expectancy for males in the heavily deprived Calton standing at 54-28 years less than in the affluent area of Lenzie, which is only eight km away.

Life expectancy is also likely to be affected by exposure to high levels of highway air pollution or industrial air pollution. Thus occupation may also have a major effect on life expectancy.

Well-educated professionals working in offices have a high life expectancy, while coal miners (and in prior generations, asbestos cutters) do not. Other factors affecting an individual's life expectancy are genetic disorders, obesity, access to health care, diet, exercise, tobacco smoking, drug use and excessive alcohol use.

Exercise 13. Expound gender differences.

Women tend to have a lower mortality rate at every age. In the womb, male fetuses have a higher mortality rate (babies are conceived at a ratio of about 124 males to 100 females, but the ratio of those surviving to birth is only 105 males to 100 females). Among the smallest premature babies (those under 2 pounds or 900 g) females again have a higher survival rate.

At the other extreme, about 90% of individuals aged 110 are female. In the past, mortality rates for females in child-bearing age groups were higher than for males at the same age. This is no longer the case, and female human life expectancy is considerably higher than those of men. The reasons for this are not entirely certain.

Traditional arguments tend to favor socio-environmental factors: historically, men have generally consumed more tobacco, alcohol and drugs than females in most societies, and are more likely to die from many associated diseases such as lung cancer, tuberculosis and cirrhosis of the liver. Men are more likely to die from injuries, whether unintentional (car accidents) or intentional (suicide, violence, war).

Men are also more likely to die from most of the leading causes of death than women. Some of these include: cancer of the respiratory system, motor vehicle accidents, suicide, cirrhosis of the liver, emphysema, and coronary heart disease. These far outweigh the female mortality rate from breast cancer and cervical cancer etc. However, such arguments are not entirely satisfactory and, even if the statistics are corrected for known socio-environmental effects on mortality, females still have longer life expectancy. Interestingly, the age of equalization (about 13) tends to be close to the age of menarche, suggesting a potential reproductive-equilibrium explanation. Some argue that shorter male life expectancy is merely another manifestation of the general rule, seen in all mammal species, that larger individuals tend on average to have shorter lives.

This biological difference occurs because women have more resistance to infections and degenerative diseases. However, many do not agree that there is a difference and there is reason to suspect that this varies over a period of time and that gender is not a significant correlator of living longer.

Exercise 14. Give examples of counterexamples.

But there are also counterexamples, suggesting that there is more to the story. Guppies in predator-free habitats evolve shorter lifespan than nearby populations of guppies where predators exact a large toll. A broad survey of mammals indicates many more exceptions. The theory of evolution of aging may be in flux.

Natural selection tends to favor short-term survival traits. Human-technology-driven artificial selection, however, now appears to have prioritized long-term survival traits, having previously improved short-term survival rates through global food-chain dominance.

Exercise 15. Describe the influence of disabilities.

In the western world, people with a serious mental illness die on average 25 years earlier than the rest of the population. In the 1990s the life expectancy of the seriously mentally ill was 10 to 15 years shorter, and now has grown to a 25 year average shorter life span. There is no objective test for mental illness, yet studies show the evidence of the increasingly earlier death of those diagnosed mentally ill. Mental illnesses include schizophrenia, bipolar disorder and major depression.

Three out of five mentally ill die from mostly preventable physical diseases. Diseases such as Heart/Cardiovascular disease, Diabetes, Dyslipidaemia, Respiratory ailments, Pneumonia, Influenza.

Stress also decreases life expectancy. The side effects of stress are: pain of any kind, heart disease, digestive problems, sleep problems, depression, obesity, autoimmune diseases, skin conditions, etc., all of which contribute to mental disorders, faster ageing, and other physical diseases.

The number of centenarians is increasing at 7% per year. Japan has the highest ratio of centenarians. In Okinawa, there are 34.7 centenarians for every 100,000 inhabitants. In the United States, the number of centenarians grew from 15,000 in 1980 to 77,000 in 2000.

It is interesting to consider why the various species of plants and animals, including humans, have different lifespans. Evolutionary theory states that organisms that, by virtue of their defenses or lifestyle, live for long periods whilst avoiding accidents, disease, predation, etc., are likely to have genes that code for slow ageing - which often translates to good cellular repair. This is so because if a random genetic trait found in the organism increases its survivability (at least up to the time when it reproduces) it is more likely to pass on its genes to the next generation.

Thus, a member of the population with genes that lend to increased survivability will tend to reproduce more and have more successors. This gene which increases survivability will thus be increasingly spread throughout the species, increasing the survivability of the species as a whole.

Conversely a change to the environment that means that organisms die younger from a common disease or a new threat from a predator will mean that organisms that have genes that code for putting more energy into reproduction than repair will do better.

Exercise 16. Render the main idea of the passage on calculating life expectancies.

The starting point for calculating life expectancies is the age-specific death rates of the population members. A very simple model of age-specific mortality uses the Gompertz function, although these days more sophisticated methods are used. In cases where the amount of data is relatively small, the most common methods are to fit the data to a mathematical formula, such as an extension of the Gompertz function, or to look at an established mortality table previously derived for a larger population and make a simple adjustment to it (e.g. multiply by a constant factor) to fit the data.

With a large amount of data, one looks at the mortality rates actually experienced at each age, and applies smoothing (e.g. by cubic splines) to iron out any apparently random statistical fluctuations from one year of age to the next. While the data required is easily identified in the case of humans, the computation of life expectancy of industrial products and wild animals involves more indirect techniques. The life expectancy and demography of wild animals are often estimated by capturing, marking and recapturing them.

The life of a product, more often termed shelf life is computed using similar methods. In the case of long-lived components such as those used in critical applications, such as in aircraft methods such as accelerated aging are used to model the life expectancy of a component.

The age-specific death rates are calculated separately for separate groups of data which are believed to have different mortality rates and are then used to calculate a life table, from which one can calculate the probability of surviving to each age. Life expectancy is by definition an arithmetic mean. It can also be calculated by integrating the survival curve from ages 0 to positive infinity (the maximum lifespan, sometimes called "omega").

THE SECRET OF LONG LIFE

"Scientists are on the verge of discovering the major secrets of ageing", says Jay Olshansky, a gerontologist based at the University of Chicago, although he is still cautious about how long a human being can expect to live. Last year Olshansky bet Steve Austad, a biologist at the University of Idaho, $150 (£9that there will be no 150-year-old alive in fairly good shape by the year 2150. He believes the upper limit is 130 years. With compound interest, one of their heirs stands to collect $500 million on the bet. Anti-ageing research receives billions of dollars of funding, yet the academics cannot even agree on what ageing is, let alone what to do about it.

Is it an inevitable process of life? Or a distinct process with signals that starts and controls it? Or could it be, as one scientist puts it, "characterised by increasing molecular disorder"? The "treatment" for ageing varies as much as the definitions. One approach is to aim for "compressed morbidity" (preventing disorders such as strokes, cancer and heart disease), which would add about 15 years to the average lifespan in the West. However, Olshansky and others suggest that we should go for "arrested ageing"; this aims to restore vitality continually by reversing the ageing process.

The latest academic thinking on ageing includes the oldest anti-ageing technique of all: calorie restriction (CR). For more than 60 years it has been known that going on a semi-starvation diet can double the lifespan of mice and worms, and reduce dramatically the risk of degenerative disorders such as cancer and heart disease. However, no one would voluntarily go on a life-time diet of 1,300 calories. Professor Bruce Ames, of the University of California, Berkeley, caused a stir last year when he reported that giving rats acetyl-carnitine and lipoic acid for a few weeks not only restored their metabolism to "youthful" levels, but also "improved their physical capacity and cognitive processes".

Ames is running a similar study on humans that should be available within the next two years, and says that he expects similar findings. A lack of micronutrients in general is, he says, "likely to be a significant factor in degenerative diseases and genetic diseases".

But Aubrey de Grey, the most radical of the "arrested ageing" advocates, says that attempting to turn back the clock with drugs or vitamin and antioxidant intake is mere handwaving. It is carrying out "futile running repairs" when you have water coming through the roof; what is really needed is replacement tiles. De Grey has developed an approach that aims to combine such biotechnologies as stem-cell transplants and genetic engineering to reverse ageing in mice "within ten years" and in humans "rapidly thereafter". "Ageing is a barbaric, uncivilised phenomenon that should not be tolerated in polite society", de Grey says.

But perhaps some of the supposed miseries of old age are not as bad as we expect. We assume that old age and decline in mental skills and memory go hand in hand. But the latest thinking, as described in Science, is that oldies are better than the young at some mental tasks. They handle social situations better, have greater verbal skills and are more accurate judges of character.

It is important to note that this statistic is usually based on past mortality experience, and assumes that the same age-specific mortality rates will continue into the future. Thus such life expectancy figures are not generally appropriate for calculating how long any given individual of a particular age is expected to live. But they are a useful statistic to summarize the current health status of a population.

The ***Life Expectancy Index*** is a statistical measure used to determine the average lifespan of the population of a certain nation or area. Life expectancy is one of the factors in measuring the Human Development Index (HDI) of each nation, along with adult literacy, education, and standard of living. Life expectancy is also a factor in finding the physical quality of life of an area. What is more, tests show that simply reading an article that says your memory skills are still largely intact can improve performance by 20 % to 30 % .

So, cheer up, you may have already turned back the clock.

Exercise 1. Give the main idea of the text in some English sentences.

Exercise 2. Summarize the text «Your teeth can last a lifetime» briefly in English.

Next time you get a cavity in a tooth, you can blame it on yourself – maybe, too, on a dentist who isn't up to date. So-called caries – the rotting away of teeth – is, or should be, old hat, largely outdated. What causes decay? Ever use an acid to etch away at a piece of metal? That, in a nutshell, is what goes on in your mouth and sets up decay. Always in the mouth are bacteria – a considerable variety. The bugs feed on food particles. A result of their feeding is acid production.

Acid eats away at the tooth enamel. It's the toughest substance in the body, but it's not acid-resistant. Eventually, the acid penetrates. It may make so tiny a hole you'd never suspect it's there. But it can be enough to let acid start working on the softer, bone-like dentin under the enamel, and then on the pulp, the living part of the tooth where nerves and blood vessels are. Once the decay process reaches the pulp, it goes without saying that you'll have pain and stand a good chance of losing the tooth. Contrary to what you may have heard, a diseased tooth isn't necessarily a local affair. Dental diseases are directly responsible for general poor health, affecting patients of all ages. Nobody knows how many ailments are triggered, or contributed to, by dental disease.

Among those particularly suspect are rheumatic disorders, gastrointestinal and kidney diseases, skin diseases, and bacterial endocarditis (a heart infection).

Recent developments in dentistry are especially welcome, for the American mouth is a disaster area. More than 20 million Americans have lost all their teeth; 90 million have 18 or more missing, decayed, or filled teeth. By age 35, one of every five people needs dentures; by 55, one of every two.

Two-thirds of youngsters below age five have decaying teeth; by the teens, five of every six.

Modern dentistry, mechanically advanced and capable of fine fix it work, had to wait a long time for a clue to any practical means of stopping tooth decay before it could get started. An American physician, a Dr. Edgar, serving in Italy as an examiner of immigrants to this country, observed that many coming from an area in Naples had brown stained but healthy teeth. It turned out that fluoride taken into the body regularly during childhood could do something remarkable.

It could be laid down, while teeth were being formed, so it combined with the enamel and made it more acid-resistant, therefore more decay-resistant. In controlled amounts it would not cause discoloration, and cavities would be reduced – at least for children – by 50 % to 65 %.

The next discovery came about 20 years ago: fluoride could be applied directly to the enamel. If a dentist painted on four coats of a 2 % sodium-fluoride solution once every three years, tooth, decay would be reduced 25 % to 40 % – but only in children up to 15. It didn't work for adults.

The search was then on for new compounds that might be better than sodium fluoride. It led to stannous fluoride, a combination of tin and fluoride. One application of stannous fluoride a year proved to be as much as 38 % more effective than four of sodium fluoride. It turned out, too, that stannous fluoride could work for adults as well as children. Meanwhile, Indiana University investigators were at work on a; project to develop a toothpaste that might help combat decay. The Indiana investigators finally found a way to incorporate stannous fluoride into a toothpaste so its value wouldn't be lost.

First, teeth are polished with a new pumice mixture. Immediately afterward, a 10-% stannous-fluoride solution is painted on the teeth – a 15-second procedure. The first two steps start the man off – and the third step is simply the daily use of fluoridated toothpaste.

Exercise 3. Remember the notion.

The ***Human Development Index (HDI)*** is a statistic of life expectancy, education, and per capita incomeindicators, which are used to rank countries into four tiers of human development.

A country scores higher HDI when the lifespan is higher, the education level is higher, and the GDP per capita is higher. The HDI was developed by Pakistani economist Mahbub ul Haq and Indian economist Amartya Sen which was further used to measure the country's development by the United Nations Development Program (UNDP). The 2017 Human Development Report introduced an ***Inequality-adjusted Human Development Index*** (IHDI).

MEDICAL EMERGENCY

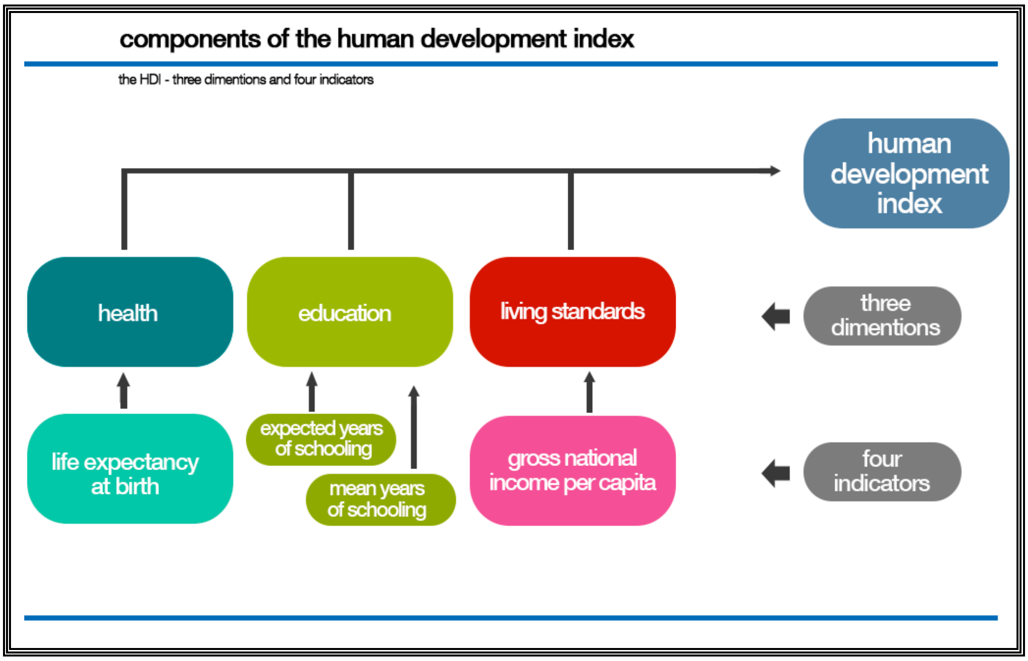
A medical emergency is an injury or illness that is acute and poses an immediate risk to a person's life or long term health. These emergencies may require assistance from another person, who should ideally be suitably qualified to do so, although some of these emergencies can be dealt with by the victim themselves. Dependent on the severity of the emergency, and the quality of any treatment given, it may require the involvement of multiple levels of care, from a first aider to an emergency physician through to specialist surgeons.

Any response to an emergency medical situation will depend strongly on the situation, the patient involved and availability of resources to help them. It will vary depending on whether the emergency occurs whilst in hospital under medical care, or outside of medical care (for instance, in the street or alone at home). For emergencies starting outside of medical care, a key component of providing proper care is to summon the emergency medical services (usually an ambulance), by calling for help using the appropriate local emergency telephone number.

Those trained to perform first aid can act within the bounds of the knowledge they have, whilst awaiting the next level of definitive care. Those who are not able to perform first aid can also assist by remaining calm and staying with the injured or ill person. A common complaint of emergency service personnel is the propensity of people to crowd around the scene of victim, as it is generally unhelpful, making the patient more stressed, and obstructing the smooth working of the emergency services.

Many states of the USA have "Good Samaritan laws" which protect civilian responders who choose to assist in an emergency. Responders acting within the scope of their knowledge and training as a "reasonable person" in the same situation would act are often immune to liability in emergency situations. Usually, once care has begun, a first responder or first aid provider *may not* leave the patient or terminate care until a responder of equal or higher training assumes care. This can constitute abandonment of the patient, and may subject the responder to legal liability.

Care must be continued until the patient is transferred to a higher level of care, the situation becomes too unsafe to continue, or the responder is physically unable to continue due to exhaustion or hazards. The principles of the chain of survival apply to medical emergencies where the patient has an absence of breathing and heartbeat. This involves the four stages unless the situation is particularly hazardous, and is likely to further endanger the patient, evacuating an injured victim requires special skills, and should be left to the professionals of the emergency medical and fire service.



Exercise 1. Digest the score of the information briefly in English.

Exercise 2. Explain the score of rescue squad.

A rescue squad may be an organization that provides emergency medical care to both trauma and medical patients at either the basic life support or advanced life support levels. The staff of such agencies can possess any number of certifications including first responder, emergency medical technician, and paramedic. Typically, the term "rescue squad" is synonymous with first aid squad, emergency squad, safety squad, ambulance squad, ambulance corps, and EMS.

However, the term "rescue squad" can also be associated with a fire department rescue team or other type of fire-related function. In some states, a Rescue Squad is an organization staffed by volunteers who offer assistance and is limited to vehicle extraction, search and rescue, and other community services. Typically, a rescue squad has equipment such as ambulances, light and heavy-duty rescue vehicles, such as squad trucks or crash-trucks, and possibly boats. Initially, rescue squads performed both medical services and what are now considered technical rescue operations.

Such operations include, but are not limited to: confined space rescue, cave rescue, vehicle extrication, search and rescue, rope rescue, building collapse, underwater dive rescue, and swift water rescue. As a result, many rescue squads that used to function as "true rescue squads" have recently begun to provide only basic EMS ambulance services or have dissolved completely. However, many rescue squads still maintain and perform their original and historical functions of both emergency medical services and rescue operations, like those listed above.

Exercise 3. Classify the notion «ambulance».

An *ambulance* is a vehicle for transporting sick or injured people, to, from or between places of treatment for an illness or injury. The term ambulance is used to describe a vehicle used to bring medical care to patients outside of the hospital or to transport the patient to hospital for follow-up care and further testing. The word is most commonly associated with the land-based, emergency motor vehicles that administer emergency care to those with acute illnesses or injuries, hereafter known as *emergency ambulances*. These are usually fitted with flashing warning lights and sirens to facilitate their movement through traffic. It is these emergency ambulances that are most likely to display the Star of Life, which represents the six stages of pre-hospital medical care.

Other vehicles used as ambulances include trucks, vans, bicycles, motorbikes, station wagons, buses, helicopters, fixed-wing aircraft, boats, and even hospital ships.

The term "*ambulance*" comes from the Latin word "*ambulare*", meaning to walk or move about which is a reference to early medical care where patients were moved by lifting or wheeling. The word originally meant a moving hospital which follows an army in its movements. During the American Civil War vehicles for conveying the wounded off the field of battle were called ambulance wagons.

Field hospitals were still called ambulances during the Franco-Prussian War of 1870 and in the Serbo-Turkish war of 1876 even though the wagons were first referred to as ambulances about 1854 during the Crimean War. Ambulances were first used for emergency transport in 1487 by the Spanish, and civilian variants were put into operation during the 1830s. Advances in technology throughout the 19th and 20th centuries led to the modern self-powered ambulances.

Exercise 4. Characterize functional types of ambulances.

Ambulances can be grouped into types depending on whether or not they transport patients, and under what conditions. In some cases, ambulances may fulfil more than one function.

- **Emergency ambulance**. The most common type of ambulance, which provide care to patients with an acute illness or injury. These can be road-going vans, boats, helicopters, fixed-wing aircraft (known as air ambulances) or even converted vehicles such as golf carts.
- **Patient transport ambulance**. A vehicle which has the job of transporting patients to, from or between places of medical treatment, such as hospital or dialysis center, for non-urgent care. These can be vans, buses or other vehicles.
- **Response unit**. Also known as a fly-car, which is a vehicle which is used to reach an acutely ill patient quickly, and provide on scene care, but lacks the capacity to transport the patient from the scene. Response units may be backed up by an emergency ambulance which can transport the patient. These can be a wide variety of vehicles, from standard cars, to modified vans, motorcycles, pedal cycles, quad bikes or horses.
- **Charity ambulance**. A special type of patient transport ambulance is provided by a charity for the purpose of taking sick children or adults on trips or vacations away from hospitals, hospices or care homes where they are in long term care. Examples include the UK's "Jumbulance" project. These are usually based on a bus.

Exercise 5. Describe modern equipment.

In addition to the equipment directly used for the treatment of patients, ambulances may be fitted with a range of additional equipment which is used in order to facilitate patient care. This could include:

- ***Two way radio***. One of the most important pieces of equipment in modern emergency medical services as it allows for the issuing of jobs to the ambulance, and can allow the crew to pass information back to control or to the hospital. More recently many services world wide have moved from traditional sets, which can be monitored externally, to more secure systems.
- ***Mobile data terminal***. Some ambulances are fitted with Mobile Data Terminals, which are connected wirelessly to a central computer, usually at the control center. They can function instead of or alongside the two way radio and can be used to pass details of jobs to the crew, and can log the time the crew was mobile to a patient, arrived, and left scene, or fulfill any other computer based function.
- ***Evidence gathering CCTV***. Some ambulances are now being fitted with video cameras used to record activity either inside or outside the vehicle. They may also be fitted with sound recording facilities. This can be used as a form of protection from violence against ambulance crews, or in some cases to prove or disprove cases where a member of crew stands accused of malpractice.
- ***Tail lift or ramp***. Ambulances can be fitted with a tail lift or ramp in order to facilitate loading a patient without having to undertake any lifting. This is especially important where the patient might be obese or specialty care transports that require bulky equipment such as an neonatal incubator.
- ***Trauma lighting***. In addition to normal working lighting, ambulances can be fitted with special lighting which is used when the patient becomes photosensitive.
- ***Air conditioning***. Ambulances are often fitted with a separate air conditioning system to serve the working area from that which serves the cab. This helps to maintain an appropriate temperature for any patients being treated, but may also feature additional features such as filtering against airborne pathogens.
- ***Data Recorders***. These are often placed in ambulances to record such information as speed, braking power and time, activation of active emergency warnings such as lights and sirens, as well as seat belt usage. These are often used in coordination with GPS units.

Exercise 6. Translate the words and phrases into Russian drawing up sentences with them.

Emergency; ready for all emergencies; in case of emergency; on emergency; to save for an emergency; to cause (create) emergency; to declare an emergency; grave (serious) emergency; life-and-death emergency; life-threatening emergency; national emergency; the state of emergency; emergency ambulance; emergency forces; emergency measures; emergency powers; emergency room; emergency station; to rise to the emergency; emergency fund; emergency decree; emergency maintenance; emergency work; emergency conditions; riot emergency; emergency door (exit); to pull an emergency cord; emergency ration (store); emergency services; emergency relief; emergency loan; in-flight emergency; critical emergency; short-term emergency; standby emergency; emergency area; Emergency Banking Relief Act; emergency bed service.

Exercise 7. Read the article on physician offices and render its contents.

This is the most common site for the delivery of ambulatory care. Physicians of many specialties deliver ambulatory care. These physicians include specialists in family medicine, internal medicine, obstetrics, gynecology, cardiology, gastroenterology, endocrinology, ophthalmology, and dermatology.

Hospital emergency departments

Some visits to emergency departments result in hospital admission, so these would be considered emergency medicine visits rather than ambulatory care. Most visits to hospital emergency departments, however, do not require hospital admission. Many of these visits are not true emergencies and are better seen in an urgent care center.

Urgent care centers

The Urgent Care Association of America(UCAOA) estimates that over 15,000 urgent care centers deliver urgent care in the USA. These centers are designed to evaluate and treat conditions that are not severe enough to require treatment in a hospital emergency department but still require treatment beyond normal physician office hours or before a physician appointment is available.

Ambulatory care classifications

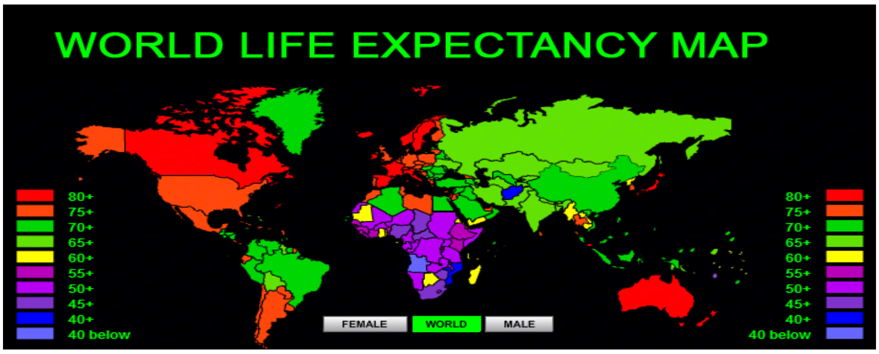
Ambulatory care is generally classifiable in two groups:

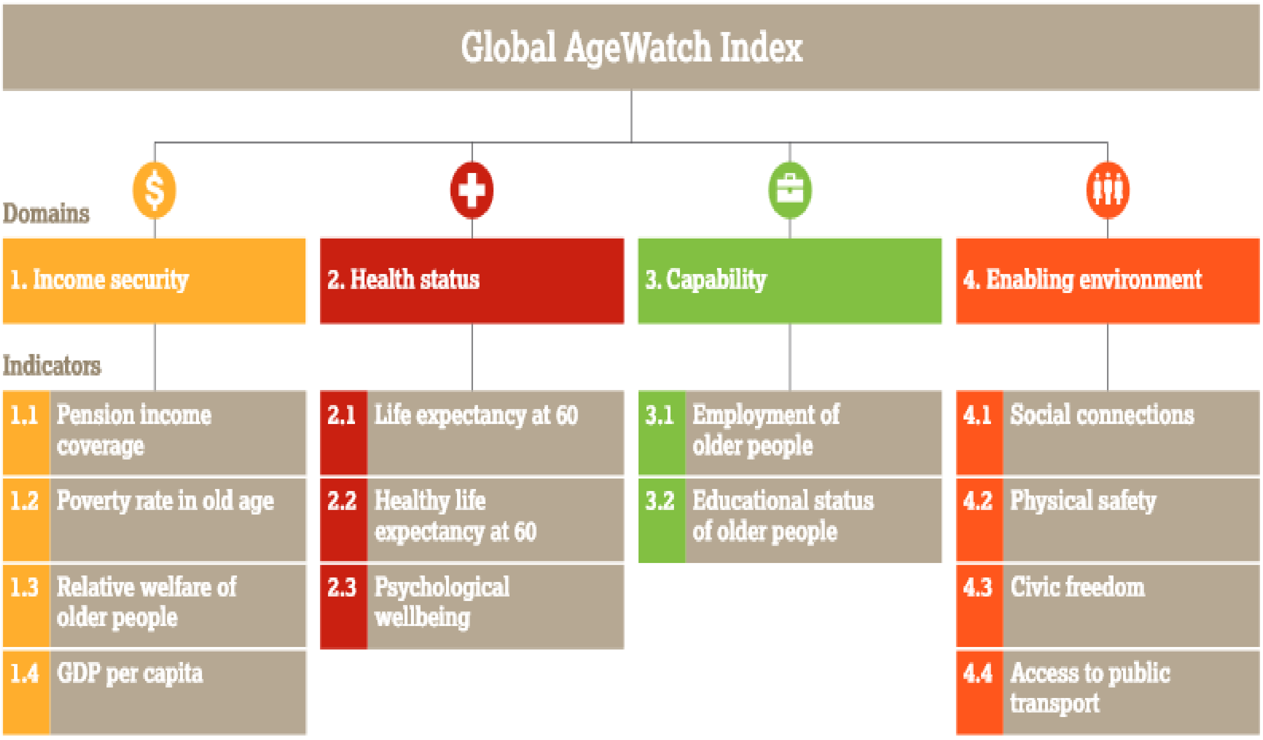
- Medical institution-based settings, including: Ambulatory care clinics, ambulatory surgery centers and emergency medical services.
- Non-medical institution-based settings, including: School and prison health; vision, dental and pharmaceutical care.

Exercise 8. Translate the words and phrases into Russian drawing up sentences with them.

Army ambulance; ambulance box; jeep ambulance; medical ambulance; to call in an ambulance; air ambulance; flying ambulance; ambulance boat; ambulance car; ambulance insert; ambulance lorry; ambulance man; ambulance room; ambulance service; ambulance shuttle; ambulance situation; ambulance station; ambulance surgeon; ambulance train; ambulant; ambulant case; ambulant therapy; to ambulate; ambulation; ambulatory.

Exercise 9. Compare the organization of medical emergency in the UK, the USA and Ukraine.





Exercise 10. Explain the main features of intermediate technology.

In parts of the world which lack a high level of infrastructure, ambulances are designed to meet local conditions, being built using intermediate technology. Ambulances can also be trailers, which are pulled by bicycles, motorcycles, tractors, or animals. Animal-powered ambulances can be particularly useful in regions that are subject to flooding. Motorcycles fitted with sidecars are also used, though they are subject to some of the same limitations as more traditional over-the-road ambulances.

The level of care provided by these ambulances varies between merely providing transport to a medical clinic to providing on-scene and continuing care during transport. They are required to gain access to patients as quickly as possible, and in many countries, are given dispensation from obeying certain traffic laws (for instance, they may be able to treat a red traffic light or stop sign as a yield ("give way") sign, or be permitted to break the speed limit).

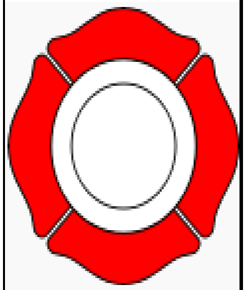
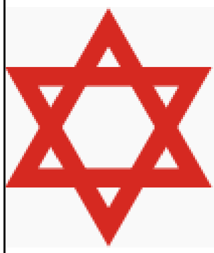
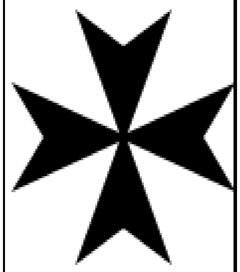
For these reasons, emergency ambulances are often fitted with visual and/or audible warnings to alert road users of two types – either passive or active.

Passive visual warnings

The passive visual warnings are usually part of the design of the vehicle, and involve the use of high contrast patterns. Older ambulances (and those in developing countries) are more likely to have their pattern painted on, whereas modern ambulances generally carry retro-reflective designs which reflect light from car headlights or torches. Another passive marking form is the word *ambulance* spelled out in reverse on the front of the vehicle. This enables drivers of other vehicles to more easily identify an approaching ambulance in their rear view mirrors.

Ambulances may display the name of their owner or operator, and a telephone number which may be used to summon the ambulance. Ambulances may also carry an emblem, such as a Red Cross, Red Crescent or Red Crystal.

These are symbols laid down by the Geneva Convention, and all countries signatory to it agree to restrict their use to either (1) Military Ambulances or (2) the national Red Cross or Red Crescent society. Fire service operated ambulances may display the Cross of St. Florian (often, incorrectly, called a Maltese cross) as this cross is frequently used as a fire department logo (St. Florian being the patron saint of firefighters).

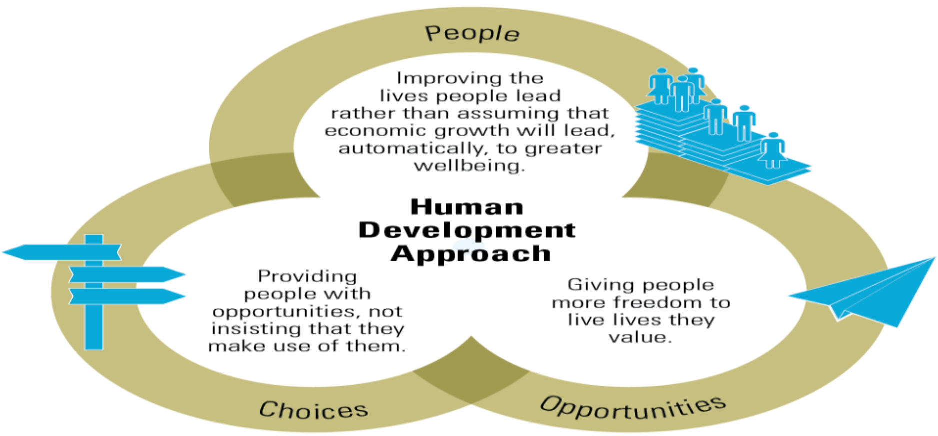
				
Star of life	Red Cross	Red Crescent	Red Magen David	Amalfi Cross

Active visual warnings

The active visual warnings are usually in the form of flashing coloured lights (sometimes known as "beacons" or "lightbars"). These flash in order to attract the attention of other road users as the ambulance approaches, or to provide warning to motorists approaching a stopped ambulance in a dangerous position on the road. Common colours for ambulance warning beacons are blue and red.

Audible warnings

In addition to visual warnings, ambulances can be fitted with audible warnings, sometimes known as sirens, which can alert people and vehicles to the presence of an ambulance before they can be seen. The first audible warnings were mechanical bells, mounted to either the front or roof of the ambulance. Most modern ambulances are now fitted with electronic sirens, which can produce a range of different noises. Ambulance services may specifically train their drivers to use different siren tones in different driving situations. For instance, on a clear road the "wail" setting may be used, which gives a long and steady up and down variation. At busy intersections, the "yelp" setting may be employed, which delivers a more rapid bursting signal. "Dual tone" and "phaser" modes are also available on many modern sirens. Changing the speed and pitch of the warning intensifies the alert delivered to drivers in the ambulance's path.



UNITII. HISTORY OF HOSPITALS

INTRODUCTION

Originally, *hospital* meant a place where strangers or visitors were received; in the course of time, its use was restricted to institutions for the care of the sick. This modification is incidental to the long development through which the hospital itself has passed under the varying influences of religious, political, and economic conditions, and of social and scientific progress.

Viewed in a large way the typical modern hospital represents natural human solicitude for suffering, ennobled by Christian charity and made efficient by the abundant resources of medical skill.

While among savage tribes, e.g. the ancient Germans, the sick and feeble were often put to death, more humane practices are found among civilized peoples.

One of the earliest hospitals on record was founded in Ireland, 300 B. C., by Princess Macha. It was called "Broin Bearg" (house of sorrow), and was used by the Red Branch Knights and served as the royal residence in Ulster until its destruction in A.D. 332

In India, the Buddhist King Azoka (252 B. C.) established a hospital for men and animals.

The Mexicans in pre-Columbian times had various institutions in which the sick and poor were cared for. In a general way the advance in medical knowledge implies that more was done to relieve suffering; but it does not necessarily prove the existence of hospitals.

From the Papyri we learn that the Egyptians employed a considerable number of remedies and that the physicians held clinics in the temples. Similar customs prevailed in Greece; the sick resorted to the temple of Esculapius where they spent the night in the hope of receiving directions from the god through dreams which the priests interpreted. Lay physicians conducted dispensaries in which the poor received treatment.

At Epidaurus the Roman senator Antoninus erected (A.D. 170) two establishments, one for the dying and the other for women lying-in; patients of these classes were not admitted in the Esculapium.

The Romans in their treatment of the sick adopted many Greek usages. Esculapius had a temple on the island in the Tiber (291 B.C.), where now stand the church and monastery of St. Bartholomew, in which the same rites were observed as among the Greeks. Municipal physicians were appointed to treat various classes of citizens, and these practitioners usually enjoyed special privileges and immunities. Provision was made in particular for the care of sick soldiers and slaves, the latter receiving attention in the *valetudinaria* attached to the estates of the wealthier Romans.

But there is no record of any institution corresponding to our modern hospital. It is noteworthy that among pagan peoples the care of the sick bears no proportion to the advance of civilization.

Though Greece and Rome attained the highest degree of culture, their treatment of the sick was scarcely equal, certainly not superior, to that which was found in the oriental nations.

Both Greeks and Romans regarded disease as a curse inflicted by supernatural powers and rather sought to propitiate the malevolent deity than to organize the work of relief.

On the other hand the virtue of hospitality was quite generally insisted on; and this trait, as will presently appear, holds a prominent place in Christian charity.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Make up some dialogues from the information above.

Exercise 3. Generate all events which are in the text.

Exercise 4. Read the information & pick up the essential details in the form of quick notes.

CHRISTIAN TIMES

Among the "many wonders and signs done by the Apostles in Jerusalem" was the restoration of the lame man, and of the cripple at Lystra, besides the larger number whom the shadow of St. Peter delivered from their infirmities. St. Paul enumerates among the charismata the "grace of healing", and St. James admonishes the faithful in case of sickness to bring in the priests of the Church and let them pray over the sick man "and the prayer of faith shall save him".

The Sacrament of Extreme Unction was instituted not only for the spiritual benefit of the sick but also for the restoration of their bodily health. Like the other works of Christian charity, the care of the sick was from the beginning a sacred duty for each of the faithful, but it devolved in a special way upon the bishops, presbyters, and deacons. The same ministrations that brought relief to the poor naturally included provision for the sick who were visited in their homes. This was especially the case during the epidemics that raged in different parts of the Roman Empire.

Valuable assistance was also rendered by physicians, slaves, or freedmen, who had become Christians and who like Cosmas and Damian were no less solicitous for the souls than for the physical needs and bodily comfort and well-being of their patients. Another characteristic of Christian charity was the obligation and practice of hospitality. The bishop in particular must be "given to hospitality".

The Christian, therefore, in going from place to place, was welcomed in the houses of the brethren; but like hospitality was extended to the pagan visitor as well. Clement of Rome praises the Corinthians for their hospitality and Dionysius of Corinth for the same reason gives credit to the Romans. The bishop's house above all others was open to the traveller who not only found food and shelter there but was provided in case of need with the means to continue his journey.

In some cases the bishop was also a physician so that medical attention was provided for those of his guests who needed it. The sick were also cared for in the valetudinaria of the wealthier Christians who in the spirit of charity extended hospitality to those who could not be accommodated in the bishop's house. There was thus from the earliest times a well organized system of providing for the various forms of suffering; but it was necessarily limited and dependent on private endeavour so long as the Christians were under the ban of a hostile State.

Until persecution ceased, an institution of a public character such as our modern hospital was out of the question. It is certain that after the conversion of Constantine, the Christians profited by their larger liberty to provide for the sick by means of hospitals.

But various motives and causes have been assigned to explain the development from private care of the sick to the institutional work of the hospital. It was not, at any rate, due to a slackening of charity as has been asserted, but rather to the rapid increase in the number of Christians and to the spread of poverty under new economic conditions. To meet these demands, a different kind of organization was required, and this, in conformity with the prevalent tendency to give all work for the common weal an institutional character, led to the organization and founding of hospitals.

When and where the first hospital was established is a matter of dispute. According to some authorities St. Zoticus built one at Constantinople during the reign of Constantine, but this has been denied. But that the Christians in the East had founded hospitals before Julian the Apostate came to the throne (361) is evident from the letter which that emperor sent to Arsacius, high-priest of Galatia, directing him to establish a xenodochium in each city to be supported out of the public revenues.

As he plainly declares, his motive was to rival the philanthropic work of the Christians who cared for the pagans as well as for their own. A splendid instance of this comprehensive charity is found in the work of St. Ephraem who, during the plague at Edessa (375), provided 300 beds for the sufferers. But the most famous foundation was that of St. Basil at Cesarea in Cappadocia (369). This "Basilias", as it was called, took on the dimensions of a city with its regular streets, buildings for different classes of patients, dwellings for physicians and nurses, workshop and industrial schools.

St. Gregory of Nazianzus was deeply impressed by the extent and efficiency of this institution which he calls "an easy ascent to heaven" and which he describes enthusiastically.

St. Basil's example was followed throughout the East: many famous people founded "multa publica hospitum et pauperum domicilia" i.e. many homes for strangers and for the poor. In the same city, St. Samson early in the 6th century, founded a hospital near the church of St. Sophia; this was destroyed but was restored under Justinian who also built other hospitals in Constantinople.

Du Cange enumerates 35 establishments of the kind in this city alone. Among the later foundations in Constantinople, the most notable were the orphanotrophium established by Alexius I (1081-1118), and the hospital of the Forty Martyrs by Isaac II (1185-1195). The fact that the first hospitals were founded in the East accounts for the use, even in the West, of names derived from the Greek to designate the main purpose of each institution. Of the terms most frequently met with

- the *Nosocomium* was for the sick;
- the *Brephotrophium* for foundlings;
- the *Orphanotrophium* for orphans;
- the *Ptochium* for the poor who were unable to work;
- the *Gerontochium* for the aged;
- the *Xenodochium* for poor or infirm pilgrims.

The same institution often ministered to various needs; the strict differentiation implied by these names was brought about gradually. In the West, the earliest foundation was that of Fabiola at Rome about 400. "She first of all", says St. Jerome, "established a nosocomium to gather in the sick from the streets and to nurse the wretched sufferers wasted with poverty and disease".

About the same time, the Roman senator Pammachius founded a xenodochium at Porto which St. Jerome praises in his letter on the death of Paulina, wife of Pammachius. According to De Rossi, the foundations of this structure were unearthed by Prince Torlonia. Pope Symmachus (498-514) built hospitals in connexion with the churches of St. Peter, St. Paul, and St. Lawrence.

During the pontificate of Vigilius (537-555) Belisarius founded a xenodochium in the Via Lata at Rome. Pelagius II (578-590) converted his dwelling into a refuge for the poor and aged. Stephen II (752-757) restored four ancient xenodochia, and added three others.

It was not only in countries that retained the traditions of pagan culture and civilization that Christianity exerted its beneficent influence; the same spirit of charity appears wherever the Christian Faith is spread among the fierce and uncultured peoples just emerging from barbarism.

The first establishment in France dates from the 6th century, when the pious King Chuldebert and his spouse founded a xenodochium at Lyons. The hospice assigned considerable revenues. It belongs to that group of institutions which grew up in connexion with the cathedral or with the principal church of each large city. In Spain the most important institution for the care of the sick was that founded in 580 by Bishop Masona at Augusta Emerita (Merida), a town in the Province of Badajoz.

The bishop endowed this hospital with large revenues, supplied it with physicians and nurses, and gave orders that wherever they found a sick man, "slave or free, Christian or Jew", they should bring him in their arms to the hospital and provide him with bed and proper nourishment.

Exercise 1. Describe early Christian times.

Exercise 2. Define the term «hospital».

Exercise 3. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 4. Define the state of the matter during the Middle Ages.

During the period of decline and corruption which culminated under Charles Martel the hospitals, like other ecclesiastical institutions, suffered considerably. Charlemagne, therefore, along with his other reforms, made wise provision for the care of the sick by decreeing that those hospitals which had been well conducted and had fallen into decay should be restored in accordance with the needs of the time. He further ordered that a hospital should be attached to each cathedral and monastery. Hincmar exhorts his clergy to supply the needs of the sick and the poor. Notwithstanding these measures, there followed, after Charlemagne's death (814), another period of decadence marked by widespread abuse and disorder.

The hospitals suffered in various ways, especially through the loss of their revenues which were confiscated or diverted to other purposes. In a letter to Louis the Pious written about 822, Victor, Bishop of Chur, complains that the hospitals were destroyed.

But even under these unfavourable conditions many of the bishops were distinguished by their zeal and charity, among them Ansgar, Archbishop of Hamburg (died 865), who founded a hospital in Bremen which he visited daily. During the 10th century the monasteries became a dominant factor in hospital work. The famous Benedictine Abbey of Cluny, founded in 910, set the example which was widely imitated throughout France and Germany. Besides its infirmary for the religious, each monastery had a hospital in which externs were cared for.

These were in charge of the *eleemosynarius*, whose duties, carefully prescribed by the rule, included every sort of service that the visitor or patient could require. As he was also obliged to seek out the sick and needy in the neighbourhood, each monastery became a centre for the relief of suffering. No less efficient was the work done by the diocesan clergy in accordance with the disciplinary enactments of the councils of Aachen, which prescribed that a hospital should be maintained in connexion with each collegiate church.

The canons were obliged to contribute towards the support of the hospital, and one of their numbers had charge of the inmates. As these hospitals were located in cities, more numerous demands were made upon them than upon those attached to the monasteries. In this movement the bishop naturally took the lead, hence the hospitals founded by Heribert (died 1021) in Cologne, Godard (died 1038) in Hildesheim, Conrad (died 975) in Constance and Ulrich (died 973) in Augsburg.

Exercise 5. Read the passages above and comment in a balanced way on how the hospitals were established.

Exercise 6. Read the information & pick up the essential details in the form of quick notes.

Exercise 7. Make notes of your new knowledge about hospitals and hospital care and make up a small report and give a talk in class.

Exercise 8. Explain the hospital orders.

The establishment of confraternities and religious orders for the purpose of ministering to the sick is one of the most important phases in this whole development. The first of these appeared at Siena towards the end of the 9th century, when Soror (died 898) founded the hospital of Santa Maria della Scala and drew up its rules. The management was largely in the hands of the citizens, though subject to the bishop's control until 1194, when Celestine III exempted it from episcopal jurisdiction.

Similar institutions, for the most part governed by the Rule of St. Augustine, sprang up in all parts of Italy; but by the beginning of the 13th century they had passed from the bishop's control to that of the magistrate. In the northern countries – Belgium, France, and Germany – the Beguines and Beghards, established in the latter part of the 12th century, included in their charitable work the care of the sick. St. Elizabeth of Hungary founded two hospitals at Eisenach and a third on the Wartburg. But the most important of the orders established during this period was that of the Holy Ghost.

About the middle of the 12th century (c. 1145) Guy of Montpellier had opened in that city a hospital in honour of the Holy Ghost and prescribed the Rule of St. Augustine for the brothers in charge, approved in 1198 by Innocent III, which spread rapidly throughout France.

In 1204 the same pontiff built a hospital called St. Maria in Sassia, where King Ina, about 728, had founded the *schola* for English pilgrims. By the pope's command, Guy de Montpellier came to Rome and took charge of this hospital, which was thenceforward Santo Spirito in Sassia. The pope's example was imitated all over Europe. Nearly every city had a hospital of the Holy Ghost.

In Rome itself Cardinal Giovanni Colonna founded (1216) the hospital of St. Andrea, not far from the Lateran; and in accordance with the will of Cardinal Pietro Colonna the hospital of St. Giacomo in Augusta was founded in 1339. Querini gives the foundations in Rome as follows: 11th century – 4; 12th – 6; 13th – 10; 14th – 5; 15th – 5, i.e. a total of 30 hospitals for the care of the sick and infirm founded in the city of the popes during the Middle Ages.

Exercise 9. Expound the military orders.

The Crusades gave rise to various orders of chivalry which combined with military service the care of the sick. The earliest of these was the Order of St. John.

Several hospitals had already been founded in Jerusalem to provide for pilgrims. At all events, when the First Crusade reached Jerusalem in 1099, Gerhard the superior of the latter hospital, give the establishment a new building near the church of St. John the Baptist, whence apparently the order took its name. It spread rapidly in the Holy Land and in Europe, especially in the Mediterranean ports which were crowded with crusaders. Its original purpose was hospital work and according to the description given (c. 1160) by John of Wisburg the hospital at Jerusalem cared for over 2000 patients.

The military feature was introduced towards the middle of the 12th century. In both respects the order for a time rendered excellent service, but during the 13th century increasing wealth and laxity of morals brought about a decline in Christian charity and zeal and the care of the sick was in large measure abandoned. The Teutonic Order developed out of the field hospital under the walls of Acre, in which Count Adolf of Holstein with other German citizens (from Bremen & Lubeck) ministered to the sick and wounded. Under the name of "domus hospitalis St. Marie Teutonicorum in Jerusalem", it was approved by Clement III in 1191. The members bound themselves by vow to the service of the sick, and the rule prescribed that wherever the order was introduced it should build a hospital.

The centre of its activity however, was soon transferred from the Holy Land to Europe, especially to Germany where, owing to its strict organization and excellent administrative methods, it was given charge of many already existing hospitals. Among its numerous establishments those at Elbing and Nuremberg enjoyed the highest repute. In spite, however, of prudent management and of loyalty to its original purpose, the Teutonic Order suffered so severely through financial losses.

CITY HOSPITALS

The Crusades, by opening up freer communication with the East, had quickened the spirit of commercial enterprise throughout Europe, and in consequence, the city, as distinct from the feudal estate and the village, came into existence. The resulting economic conditions affected the hospital development in two ways. The increasing population of the cities necessitated the construction of numerous hospitals; on the other hand, more abundant means were provided for charitable work.

Foundations by the laity became more frequent. Public-spirited individuals, guilds, brotherhoods, and municipalities gave freely towards establishing and endowing hospitals.

In this movement the Italian cities were foremost. Monza in the 12th century had three; Milan eleven; Florence (14th century) thirty.

The German towns were no less active; Stendal had seven hospitals; Quedlinburg, four; Halberstadt eight; Magdeburg, five; Halle, four; Erfurt, nine; Cologne, sixteen. As to the share which the municipalities took in this movement, opinions differ. Some authors hold that in most cases the city hospital was founded and endowed by the city authorities; while others declare that between the 12th and the 16th centuries, comparatively few foundations were made by the municipality, though this often seconded private initiative with lands and subventions and willingly took over the direction of hospitals once they were established.

It is however beyond question that the control of the hospitals passed quite generally into the hands of the municipality especially in Italy and Germany. As a rule the transfer was easily effected on the basis of an agreement between the superior and the civil authorities, e.g. Lindau, 1307; Lucerne, 1319; Frankfort, 1283; Cologne, 1321. In certain cases where dispute arose as to the observance of the agreement, the matter was referred to high ecclesiastical authority.

Thus, the Holy Ghost hospital at Göttingen was given over to the municipality by order of the Council of Basle in 1470. Such transfers, it should be noted, implied no opposition to ecclesiastical authority. They simply resulted from the general development which obliged the authorities in each city to intervene in the management of institutions on which the public weal in large measure depended.

There was no question of secularization in the modern sense of the term. Much less can it be shown that the Church forbade clerics any share in the control of hospitals, though some modern writers have thus interpreted the decree of the Council of Vienne in 1311.

The decree was aimed at an abuse which diverted hospital funds from their original charitable purpose to the emolument of individuals. On the other hand, the Council of Ravenna in the same year (1311), considering the waste and malversation of hospital revenues, ordered that the management, supervision, and control of these institutions should be given exclusively to religious persons.

In France, the movement in favour of secular control advanced much more slowly. King Philip Augustus in 1200 decreed that all hospitals and hospital funds should be administered by the bishop or some other ecclesiastic. The Council of Paris (1212) took measures to reduce the number of attendants in the hospitals which, the bishops declared, were meant for the service of the sick and not for the benefit of those in good health.

At the Council of Arles (1260) it was enacted, in view of prevalent abuses, that hospitals should be placed under ecclesiastical jurisdiction and conducted by persons who would "lead a community life, present annual reports of their administration and retain for themselves nothing beyond food and clothing". Similar decrees were issued by the Council of Avignon.

Exercise 1. Read the text on city hospitals and give the main idea of it briefly in English.

Exercise 2. Analyze the information and use it in practice.

Exercise 3. Make up some dialogues from the information above.

Exercise 4. Write a small essay on the topic.

HOSPITALS IN GREAT BRITAIN

In these countries the care of the sick, like other works of charity, was for a long time entrusted to the monastic orders. Each monastery, taking its pattern from those on the Continent, provided for the treatment both of its own inmates who fell ill and of infirm persons in the neighbourhood.

In 936 King Athelstan returning from his successful campaign against the Scots, made certain grants to the Culdees or secular canons of St. Peter's Cathedral, York, which they employed to found a hospital. This was known at first as St. Peter's, afterwards as St. Leonard's from the name of the church built in the hospital by King Stephen. It provided for 206 bedesmen and was served by a master, thirteen brethren, four seculars, eight sisters, thirty choristers, and six servites.

Archbishop Lanfranc in 1084 founded the hospital of St. Gregory outside the north gate of Canterbury and endowed it with lands and other revenues. It was a large house, built of stone and divided into two sections, one for men and the other for women.

During the first quarter of the 12th century (1123), St. Bartholomew's hospital was founded by Rahere, who had been jester of Henry I, but had joined a religious community and secured from the king a grant of land in Smoothfield near London.

This continued to be the most prominent hospital of London until its confiscation by Henry VIII.

The Holy Cross hospital at Winchester was founded in 1132 by Henry of Blois, half-brother to King Stephen; St. Mary's Spital, in 1197 by Walter Brune, citizen of London, and his wife Roesia.

The latter, at the Dissolution, had 180 beds for sick persons and travellers.

In 1215 Peter, Bishop of Winchester, established St. Thomas's hospital in London. This also was confiscated by Henry VIII but was re-established by Edward VI. At the present time St. Bartholomew's and St. Thomas's are among the most important hospitals in London.

The list of foundations in England is a long one; Tanner in his "Notitie" mentions 460. That these institutions were under Episcopal jurisdiction is clear from the enactment of the Council of Durham (1217): "those who desire to found a hospital must receive from us its rules and regulations".

Nevertheless, abuses crept in, so that in the "Articles on Reform" sent by Oxford University to Henry V in 1414, complaint is made that the poor and sick are cast out of the hospitals and left unprovided for, while the masters and overseers appropriate to themselves the revenues.

In Scotland, 77 hospitals were founded before the Reformation; Glasgow had two, Aberdeen four, Edinburgh five. "The form of the hospital was generally similar to that of the church. There was a chaplain on the staff, and the inmates were bound to pray daily for their founders and benefactors."

The existence of numerous hospitals in Ireland is attested by the names of towns such as Hospital, Spital, Spiddal, etc. The hospital was known as *forus tuaithe* i.e. the house of the territory, to indicate that it cared for the sick in a given district. In the later development, the Knights of St. John had a number of hospitals.

The most important of which was Kilmainham Priory founded about 1174 by Richard Strongbow. In or near Dublin ample provision was made for the care of the sick.

At the Reformation all these funds and charities became the property of the Protestant Church of Ireland. The famines and pestilence, which scourged these countries during the Middle Ages called into existence a considerable number of institutions, in particular the leper-houses. This name, however, was often given to hospitals which cared for ordinary patients as well as for those stricken with the plague.

Exercise 1. Render the article on hospitals in Great Britain and Ireland.

Exercise 2. Draw up some dialogues and carry them on with your classmate in class.

Exercise 3. Describe actions of the papacy.

Innumerable pontifical documents attest the interest and zeal of the popes in behalf of hospitals. The Holy See extends its favour and protection to the charitable undertakings of the faithful in order to ensure their success and to shield them against molestation from any source.

It grants the hospital permission to have a chapel, a chaplain, and a cemetery of its own: exempts the hospital from Episcopal jurisdiction, making it immediately subject to the Holy See; approves statutes, intervenes to correct abuses, defends the hospitals property rights, and compels the restitution of its holdings where these have been unjustly alienated or seized.

In particular, the popes are liberal in granting indulgences, e.g. to the founders and patrons, to those who pray in the hospital chapel or cemetery, to all who contribute when an appeal is made for the support of the hospital, and to all who lend their services in nursing the sick.

Exercise 4. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Finchley Memorial Hospital, London

FUNCTIONING OF THE MEDIEVAL HOSPITALS

It is not possible to give any account in detail that would accurately describe each and all these institutions; they differed too widely in size, equipment, and administration.

The one common feature was the endeavour to do the best possible for the sick under given circumstances; this naturally brought about improvement, now in one respect now in another, as time went on. Certain fundamental requisites, however, were kept in view throughout the Middle Ages.

Care was taken in many instances to secure a good location, the bank of a river being preferred; the Hatel-Dieu at Paris was on the Seine, Santo Spirito at Rome, on the Tiber, St. Francis at Prague, on the Moldau, the hospitals at Mains and Constance, on the Rhine, that at Ratisbon, on the Danube. Many of the hospitals, particularly the smaller ones, were located in the central portion of the city or town within easy reach of the poorer classes.

Others were built outside the city walls for the express purpose of providing better air for the inmates and of preventing the spread of infectious and contagious diseases of all kinds.

As regards construction, it should be noted that many of the hospitals accommodated but a small number of patients (seven, fifteen, or twenty-flve), the limit being usually determined by the founder or benefactor: in such cases a private dwelling sufficed or at most a building of modest dimensions. But where ampler endowment was provided the hospital was planned by able architects and constructed on a larger scale.

The interior was decorated with niches, paintings, and armorial bearings; in fact the same artistic skill that so richly adorned the churches was employed to beautify the hospital wards. Hospital construction reached a high degree of perfection about the middle of the 15th century.

Probably the best example of it is the famous hospital at Milan, opened in 1445, though not completed until the close of the 15th century. This remarkable building is still in use as a hospital and contains usually more than 2000 patients.

The administration of the hospital when this formed part of a monastery, was naturally in the hands of the abbot or prior and the details were prescribed in the monastic rule.

The statutes of the hospital orders (knights) regulated minutely the duties of the "Commander", who was at the head of each hospital. In other institutions, the official in charge was known as *magister*, *provisor*, or *rector*, this last title being given in Germany to the superior in case he was a priest, while in Italy he was called *spedalingo*. These officials were appointed by the bishop, the chapter, or the municipality, sometimes by the founder or patron.

Laymen as well as clerics were eligible; in fact, legacies were sometimes made to a hospital on condition that only lay directors should have control, as, for instance, in the case of St. Matthew's at Pavia. As in all religious establishments, the schedule of duties was strictly prescribed, as were the details of dress, food, and recreation. No one employed in the hospital was allowed to go out unaccompanied, to spend the night, or take any refreshment other than water outside the hospital. Penalties were inflicted for violation of these rules. Moreover, the hospital attendants were obliged at stated times to go out into the streets and bring in those who needed treatment.

On entering the hospital, the patient, if a Christian, went to confession and received Holy Communion, in order that peace of mind might benefit bodily health. Once admitted, he was to be treated as the master of the house as the statutes enact. According to their ability, the sick performed the duties of prayer, attendance at Mass, and reception of the sacraments.

The regulations concerning the physical well-being of the inmates prescribed that the sick should never be left without an attendant. Similar provision was made for maternity cases, and the patients were kept in the hospital for three weeks after parturition. That due attention was paid to cleanliness and comfort is evident from what the records tell of baths, bed-linens, ventilation, and heating by means of fireplaces or braziers. The medical treatment was given by monks or other ecclesiastics.

From the 12th century onward restrictions were placed on the practice of medicine by clerics, especially in regard to surgical operations, with still greater severity, in regard to the acceptance of fees for attendance on the sick. At times a physician or surgeon was called in to render special assistance in certain cases; and this became more general as the medical schools in the universities developed, as at Salerno and Montpellier. Attached to the hospital was a dispensary for the treatment of ulcers and other slight ailments.

This was conducted by the foremost surgeon of the city and three assistants, who gave their services gratuitously to the needy townsfolk and supplied them with remedies from the hospital pharmacy. To meet its expenses, each hospital had its own endowment in the shape of lands, sometimes of whole villages, farms, vineyards, and forests. Its revenues were often increased by special taxes on such products as oil, wheat, and salt; by regular contributions from charitable associations; and by the income from churches under its control. In many instances the diocesan laws obliged each of the clergy, especially the canons, to contribute to the support of the hospital.

Exercise 1. Explain the functioning of the medieval hospitals.

Exercise 2. Characterize the post-reformation period.

The injury inflicted upon the whole system of Catholic charities by the upheaval of the 16th century, was disastrous in many ways to the work of the hospitals. The dissolution of the monasteries, especially in England, deprived the Church in large measure of the means to support the sick and of the organization through which those means had been employed. Similar spoliations in Germany followed so rapidly on the introduction of the new religion that the Reformers themselves found it difficult to provide anything like a substitute for the old Catholic foundations.

Even Luther confessed more than once that under the papacy generous provision had been made for all classes of suffering, while among his own followers no one contributed to the maintenance of the sick and the poor. As a result, the hospitals in Protestant countries were rapidly secularized, though efforts were not wanting, on the part of parish and municipality, to provide funds for charitable purposes.

The Church meanwhile, though deprived of its necessary revenues, took energetic measures to restore and develop the hospital system. In France the control of the hospitals had already passed into the hands of the sovereign. Louis XIV established in Paris a special hospital for almost every need – invalids, convalescents, incurables, besides the vast "hospital general" for the poor. Since the Reformation, indeed, women have taken a more prominent part than ever in the care of the sick; over a hundred female orders or congregations have been established for this purpose.

The French Revolution, however, intervened and it was only during the 19th century that the needed improvements were introduced. In the other European countries, meanwhile, there had been many new foundations: in England, Westminster (1719), Guy's (1722), St. George's (1733); in Germany, the Charite at Berlin established by Frederick I (1710) and the hospital at Bamberg, by Bishop Franz Ludwig von Erthal (1789); in Austria the General Hospital at Vienna, promoted by Joseph II, 1784.

Exercise 3. Answer the questions on the information above.

1. What common feature was in hospitals? 2. Were certain fundamental requisites kept in view throughout the Middle Ages? 3. Why was care taken? 4. Where were many hospitals located? 5. Where were they built? 6. What did many of the hospitals accommodate? 7. Were any hospitals built by able architects and constructed on a larger scale? 8. How was the interior decorated? 9. When did hospital construction reach a high degree of perfection? 10. What is the best example of it? 11. When was it opened? 12. Is this remarkable building still in use? 13. What was the administration of the hospital at that time? 14. Who was at the head of each hospital? 15. Who was the official in charge in other institutions? 16. Laymen as well as clerics were eligible, were they? 17. As in all religious establishments, the schedule of duties was strictly prescribed, wasn't it? 18. What were the hospital attendants obliged at stated times to do? 19. Who gave the medical treatment?

Exercise 4. Read the article on hospitals in America and render the main idea of it.

The first hospital was erected before 1524 in the City of Mexico by Cortes, in gratitude, as he declared in his will, "for the graces and mercies God had bestowed on him in permitting him to discover and conquer New Spain and in expiation or satisfaction for any sins he had committed, especially those that he had forgotten, or any burden these might be on his conscience for which he could not make special atonement". Within the first decade after the Conquest, the Hospital of San Lazaro was founded with accommodation for 400 patients, and the Royal Hospital, also in the city of Mexico, was established by a decree of 1540.

The law of 1541 ordered hospitals to be erected in all Spanish and Indian towns. The Brothers of St. Hippolytus devoted themselves to the care of the sick and erected numerous hospitals. The Bethlehemites spread from Guatemala over nearly the whole of Latin America, and rendered excellent service by their hospital work until their suppression, all other religious in Mexico, in 1820.

The first hospital in the USA was erected on Manhattan Island about 1663 "at the request of Surgeon Hendricksen Varrevanger for the reception of sick soldiers who had been previously billeted on private families, and for the West India Company's negroes". Pesthouses for contagious diseases were established at New York and Charleston early in the 18th century. In 1717 a hospital for infectious diseases was built at Boston.

The first hospital established by private beneficence was the Charity Hospital at New Orleans.

This was destroyed by the hurricane of 1779. The New Charity Hospital (San Carlos) was founded in 1780.It became the City Hospital in 1811. Still in charge of the Sisters of Charity, it is one of the most important hospitals in the country, receiving annually about 8000 patients. There are now more than 400 Catholic hospitals in the USA which care for about half a million patients annually.

The multiplication of hospitals in recent times, especially during the 19th century, is due to a variety of causes. First among these is the growth of industry and the consequent expansion of city population. To meet the needs of the labouring classes larger hospital facilities have been provided, associations have created funds to secure proper care for sick members. Another important factor is the advance of medical science, bringing with it the necessity of clinical instruction.

In this respect the universities have exerted a wholesome influence: no course in medicine is possible at the present time without that practical training which is to be had in the hospital.

Conversely, the efficiency of the hospital has been enhanced by numerous discoveries pertaining to hygiene, anesthetic and antiseptic measures, contagion and infection. The experience of war has also proved beneficial. The lessons learned in the Crimea and in the American Civil War have been applied to hospital construction, and have led to the adoption of the pavilion system. The earliest foundation in Canada was Hatel-Dieu hospital. This was established in 1639 at Sillery, and later transferred to Quebec. The General Hospital was at Quebec in 1693. There are at present 87 hospitals in Canada under the control and direction of various Catholic religious communities. The hospital of today owes much to scientific progress, generous endowment, and wise administration.

HOSPITALS & HEALTH PLANNING IN THE USA

The hospital attained its "modern" institutional form by 1900-10, having passed through 3 more or less distinct stages. During the 19th century, the hospital began as an agency of social control and welfare, gradually became the principal provider of minimal medical care for the indigent and unfortunates of society, and emerged, ultimately, as the medical centre for all classes of society, as well as the locus of medical training, research, and innovation. The institutional care of the sick originated in the incidental medical facilities provided for inmates of almshouses, jails, or, as in Cleveland, military posts.

Here the first "hospital" was little more than a temporary barracks at fort Huntington, situated near the mouth of the Cuyahoga River on Lake Erie. A log structure built in 1813, it furnished sparse accommodations to treat sick or injured soldiers of the war of 1812.

During the last third of the 19th century, hospitals were transformed by a combination of scientific and technical advances that together amounted to a revolution in medical thought and practice.

The discovery of ether, chloroform, and nitrous oxide for anaesthesia in the 1840s opened new realms for the surgeon, while the germ theory introduced by Louis Pasteur and applied to medical practice by Joseph Lister in the 1860s gave a clearer understanding of disease communication and prevention. These innovations could be implemented most successfully in the controlled environment of the hospital, and medical practice shifted progressively from homes to hospitals. This transfer accelerated in the closing years of the 19th century.

There were several private sanatoriums for the care of patients with emotional or drug- and alcohol-related health problems. Hospitals ceased to be merely dormitories for the destitute. In 1891 and 1895, trustees visited major hospitals in metropolitan centres east of the Mississippi.

Hospitals first became educational institutions, helping to train physicians, when Dr. Gustav Weber† founded charity hospital medical college in 1864. Weber, a prominent surgeon, launched the new school with the full cooperation of St. Vincent de Paul hospital.

Each party benefited: Weber enjoyed privileged access to cases for clinical instruction, while St. Vincent engaged a competent medical staff at little or no cost. Although the college closed in 1870, St. Vincent had set a local precedent for close cooperation between hospitals and medical schools.

The first university hospital in Cleveland came into being in 1897-98 with the opening of Lakeside Hospital. Since 1869, Lakeside had given teaching privileges, shared with the Wooster Universitz Medical Department (WRU, 1870-84): each school held its clinical sessions at different seasons of the year. After 1884, it acquired exclusive control of teaching privileges at Lakeside.

Beginning in 1898, the medical department also nominated resident staff and furnished visiting physicians and surgeons. The first university hospital in Cleveland, Lakeside ranked among the first 10 such institutions in the U.S. Hospitals constituted the sole training ground for nursing.

In the early years of these programs, young women received in-service training in "practical nursing" and little formal instruction. Only at Lakeside, through the efforts of national expert Isabel Hampton Robb, did nursing education emphasize instruction in the theoretical and scientific side of nursing as well as the practical. Scientific medicine, particularly the laboratory-based specialties of pathology, bacteriology, and physiology, entered the institutional setting of hospitals after 1890.

The most notable example of this influence was the establishment of a bacteriology laboratory at City Hospital. Dr. William Travis Howard, a young pathologist trained at Johns Hopkins and professor of pathology at WRU, headed the laboratory and initiated scientific post-mortem examinations at City Hospital. By the turn of the century, many hospitals attracted a more affluent class of patients.

Some hospitals actively courted paying patients by offering comfortable, if not luxurious, accommodations. While no hospitals abandoned their original charitable obligations, the poor increasingly patronized out-patient dispensaries operated by the medical departments.

Following expansion and modernization in 1889, City Hospital undertook a greater role in providing medical care for the indigent throughout the city.

Later, it also erected a tuberculosis sanatorium and a hospital for contagious diseases, allowing other local hospitals to present themselves as "safe" havens for sick persons of all social classes, free from dreaded communicable illnesses. In addition to improving the attractiveness and safety of private rooms for paying patients, some hospitals permitted nonstaff doctors to visit and treat patients in the hospital setting. The principal institutional developments in hospitals in 1910-50 included the emergence of the group-practice hospital, the move of several hospitals to the suburbs, and the advent of health insurance programs.

By 1920, as noted in the hospital and health survey, local hospitals could be categorized according to the strength of their community orientation. One group drew the majority of their cases from their own vicinity. A second group no longer served just their immediate neighbourhoods but drew patients from all regions. During the depression, hospitals confronted economic uncertainties by turning to a group medical insurance plan now known as Blue Cross. Under early versions of Blue Cross, first instituted in Dallas, in 1929.

Individual hospitals concluded contracts with subscribing groups to provide hospitalization in return for a set annual fee. By this arrangement, Blue Cross enabled voluntary hospitals to maintain a steady level of bed occupancy while also preventing competition for patients among member hospitals.

In 1938 Cleveland's Blue Cross became the first prepayment plan in the U.S. to reimburse hospitals on the basis of cost, a move made possible by the growth of its subscriber group to over 100,000. Over the following decades, Blue Cross emerged as the dominant form of hospitalization insurance, covering 70% of county hospital patients on the eve of medicare in 1965.

The economic stability provided by Blue Cross, combined with advances in surgery and diagnostic technologies, encouraged considerable expansion of hospitals following World War II.

The enlargement of existing facilities and the creation of new hospitals were financed by bond issues in the case of publicly supported hospitals and by individual, corporate, and foundation contributions and reserve funds for depreciation in the case of voluntary hospitals. Federal grants, available chiefly through the provisions of the hospital survey & construction act (1946, known as the Hill-Burton Act in honour of its legislative sponsors, senator Harold Burton of Ohio and senator Lister Hill of Alabama), played only a supplementary role in hospital growth before the mid-1960s.

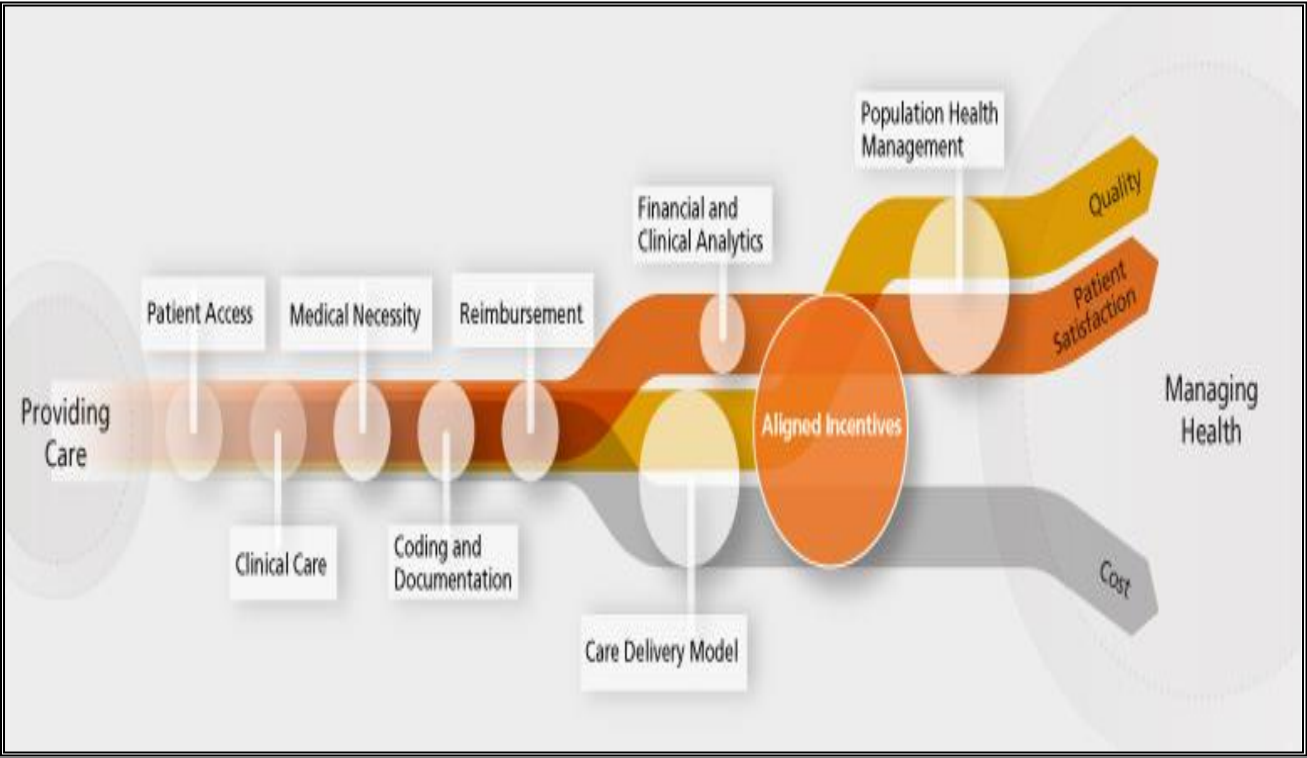
In the 1990s, continued competition for patients and the debate over national and state health care reform gave further impetus to the shift to HMOS and set off a wave of mergers, acquisitions and affiliations. The trend in this activity was toward the vertical integration of the region's health care industry into large, self-contained units consisting of insurers, physicians, hospitals and out-patient facilities that could offer a complete health care package to employers or groups of employers.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 3. Summarize your findings on hospitals and health planning, add some contemporary information and issue in a short presentation (105 words).



Exercise 4. Explain the score of management.

Public health is concerned with threats to the overall health of a community based on population health analysis. The population in question can be as small as a handful of people or as large as all the inhabitants of several continents (for instance, in the case of a pandemic).

Public health is typically divided into epidemiology, biostatistics and health services.

Environmental, social, behavioral, and occupational health are also important subfields.

Vaccination policy refers to the policy a government adopts in relation to vaccination.

Vaccinations are voluntary in some countries and mandatory in some countries. Some governments pay all or part of the costs of vaccinations for vaccines in a national vaccination schedule. Today, most governments recognize the importance of public health programs in reducing the incidence of disease, disability, and the effects of aging, although public health generally receives significantly less government funding compared with medicine. In recent years, public health programs providing vaccinations have made incredible strides in promoting health, including the eradication of smallpox, a disease that plagued humanity for thousands of years.

An important public health issue facing the world currently is HIV/AIDS. Another major public health concern is diabetes. In 2006, according to the World Health Organization, at least 171 million people worldwide suffered from diabetes. Its incidence is increasing rapidly, and it is estimated that by the year 2030, this number will double. A controversial aspect of public health is the control of smoking.

Exercise 5. Explain goals of health care systems.

Health care systems are designed to meet the health care needs of target populations.

There are a wide variety of health care systems around the world. In some countries, the health care system has evolved and has not been planned, whereas in others a concerted effort has been made by governments, trade unions, charities, religious, or other co-ordinated bodies to deliver planned health care services targeted to the populations they serve.

However, health care planning has often been evolutionary rather than revolutionary. The goals for health systems are good health, responsiveness to the expectations of the population, and fair financial contribution. Duckett (2004) proposed a two dimensional approach to evaluation of health care systems: quality, efficiency and acceptability on one dimension and equity on another.

Health care providers are trained professional people working self-employed or as an employee in an organization, whether a for-profit company, a not-for profit company, a government entity, or a charity. Organizations employing people providing health care are known as health care providers.

Examples are doctors and nurses, dentists, medical laboratory staff, specialist therapists, psychologists, pharmacists, chiropractors, and optometrists. There are generally five primary methods of funding health care systems:

- direct or out-of-pocket payments;
- general taxation;
- social health insurance;
- voluntary or private health insurance;
- donations or community health insurance.

Most countries' systems feature a mix of all five models. One study based on data from the OECD concluded that all types of health care finance "are compatible with" an efficient health care system. The study also found no relationship between financing and cost control. The term health insurance is generally used to describe a form of insurance that pays for medical expenses. It is sometimes used more broadly to include insurance covering disability or long-term nursing or custodial care needs. It may be provided through a government-sponsored social insurance program, or from private insurance companies. It may be purchased on a group basis (by a firm to cover its employees) or purchased by individual consumers. In each case, the covered groups or individuals pay premiums or taxes to help protect themselves from high or unexpected health care expenses.

Similar benefits paying for medical expenses may also be provided through schemes organized by the government and funded through contributions from users. Many government schemes also have co-payment schemes but exclusions are rare because of political pressure.

The larger insurance schemes may also negotiate fees with providers. Many forms of government insurance schemes control their costs by using the bargaining power of government to control costs in the health care delivery system. Essentially the more wealthy pay a little more into the scheme and to cover the needs of the relatively poor who therefore contribute a little less. There are usually caps on the contributions of the wealthy and minimum payments that must be made by the insured.

Exercise 6. Analyze the cross-country comparisons.

Direct comparisons of health statistics across nations are complex. The Commonwealth Fund, in its annual survey, "Mirror, Mirror on the Wall", compares the performance of the health care systems in Australia, New Zealand, the United Kingdom, Germany, Canada and the U.S. Its 2007 study found that, although the U.S. system is the most expensive, it consistently underperforms compared to the other countries. A major difference between the U.S. and the other countries in the study is that the U.S. is the only country without universal health care. The OECD also collects comparative statistics, and has published brief country profiles. Efficiency and effectiveness of service are the focus of these profiles. Perhaps most efficient is Healthcare in Taiwan, costing 6 % of GDP (1/4 US cost), universal coverage by a government-run insurer with smart card IDs to fight fraud.

HEALTH CARE SYSTEMS ALL OVER THE WORLD

Australia

In Australia the current system, known as Medicare, was instituted in 1984. It coexists with a private health system. All legal permanent residents are entitled to free public hospital care. Treatment by private doctors is also free when the doctor direct bills the Health Department (Bulk Billing).

Medicare is funded partly by a 1.5% income tax levy (with exceptions for low-income earners), but mostly out of general revenue. An additional levy of 1% is imposed on high-income earners without private health insurance. There is a uncapped 30% subsidy on private health insurance. As well as Medicare, there is a separate Pharmaceutical Benefits Scheme under which listing and a government subsidy is dependent on expert evaluation of the comparative cost-effectiveness of new pharmaceuticals.

Approximately 67% was government expenditure.

Canada

Canada has a federally sponsored, publicly funded Medicare system, with most services provided by the private sector. Each province may opt out, though none currently do. Canada's system is known as a single payer system, where basic services are provided by private doctors with the entire fee paid for by the government at the same rate. Most family doctors receive a fee per visit.

These rates are negotiated between the provincial governments and the province's medical associations, usually on an annual basis. A physician cannot charge a fee for a service that is higher than the negotiated rate – even to patients who are not covered by the publicly funded system – unless he or she opts out of billing the publicly funded system altogether. Pharmaceutical costs are set at a global median by government price controls. Other areas of health care, such as dentistry and optometry, are wholly private. Approximately 70% was government expenditure.

Cuba

Health care in Cuba consists of a government-coordinated system that guarantees universal coverage and consumes a lower proportion of the nation's GDP (7.3%) than some highly privatized systems (e.g. USA: 16%) (OECD 2008). The system does charge fees in treating elective treatment for patients from abroad, but tourists who fall ill are treated free in Cuban hospitals. Cuba attracts patients mostly from Latin America and Europe by offering care of comparable quality to a developed nation but at much lower prices. Cuba's own health indicators are the best in Latin America and surpass those of the US in some respects (infant mortality rates, underweight babies, HIV infection, immunization rates, doctor per population rates. Approximately 91% was government expenditure.

England

Healthcare in England is mainly provided by England's public health service, the National Health Service that provides healthcare to all UK permanent residents that is free at the point of need and paid for from general taxation. Though the public system dominates healthcare provision, private health care and a wide variety of alternative and complementary treatments are available for those with health insurance or willing to pay directly themselves. Approximately 79% was government expenditure.

Finland

In Finland, public medical services at clinics and hospitals are run by the municipalities (local government) and are funded 78% by taxation, 20% by patients through access charges, and by others 2%. Patient access charges are subject to annual caps. After a patient has spent 590€ per year on public medical services, all treatment and medications thereafter are free. Taxation funding is partly local and partly nationally based. Patients can claim re-imbursement of part of their prescription costs.

Finland has a much smaller private medical sector which accounts for about 14 % of total health care spending.

Only 8% of doctors choose to work in private practice, and some of these choose to do some work in the public sector. Private sector patients can claim a contribution towards their private medical costs (including dentistry) if they choose to be treated in the more expensive private sector, or they can join private insurance funds. However, private sector health care is mainly in the primary care sector. There are virtually no private hospitals, the main hospitals being either municipally owned (funded from local taxes) or run by the teaching universities (funded jointly by the municipalities and the national government). Approximately 78% was government expenditure.

France

In France, most doctors remain in private practice; there are both private and public hospitals. Social Security consists of several public organizations, distinct from the state government, with separate budgets that refunds patients for care in both private and public facilities. It generally refunds patients 70% of most health care costs, and 100% in case of costly or long-term ailments. Supplemental coverage may be bought from private insurers, most of them nonprofit, mutual insurers, to the point that the word "mutuelle" has come to be a synonym of supplemental private insurer in common language. Until recently, social security coverage was restricted to those who contributed to social security (generally, workers or retirees), excluding some poor segments of the population; the government of Lionel Jospin put into place the "universal health coverage".

In some systems, patients can also take private health insurance, but choose to receive care at public hospitals, if allowed by the private insurer. In its 2000 assessment of world health care systems, the World Health Organization found that France provided the "best overall health care" in the world.

Approximately 80% was government expenditure.

India

In India, the hospitals are run by government, charitable trusts and by private organizations.

The government hospitals in rural areas are called the primary health centre (PHC)s. Major hospitals are located in district head quarters or major cities. Apart from the modern system of medicine, traditional and indigenous medicinal systems like Ayurvedic and Unani systems are in practice throughout the country.

The Modern System of Medicine is regulated by Medical Council of India, whereas the Alternate systems recognized by Government of India are regulated by Special Department under Ministry of Health, Government of India. PHC's are non-existent in most places, due to poor pay and scarcity of resources. Patients generally prefer private health clinics. These days some of the major corporate hospitals are attracting patients from neighboring countries such as Pakistan, countries in the Middle East and some European countries by providing quality treatment at low cost.

Approximately 19% was government expenditure, but now the situation is changing.

Israel

In Israel, the publicly funded medical system is universal and compulsory. Approximately 66% was government expenditure.

Italy

In 1978 Italy adopted a tax-funded universal health care system called "National Health Service", which was closely modeled on the British system.

The SSN covers general practice (distinct between adult and pediatric practice), outpatient and inpatient treatments, and the cost of most (but not all) drugs and sanitary ware.

The government sets LEA (fundamental levels of care) which covers all necessary treatments, which the state must guarantee to all for free or for a "ticket", a share of the costs. The public system has also the duty of prevention at place of work and in the general environment. A private sector also exists, with a minority role in medicine but a principal role in dental health, as most people prefer private dental services.

In Italy the public system has the unique feature of paying general practitioners a fee per capita per year, a salary system that does not reward repeat visits, testing, and referrals. While there is a paucity of nurses, Italy has one of the highest doctors per capita ratios at 3.9 doctors per 1,000 patients. Approximately 76% was government expenditure.

Germany

Germany has a universal multi-payer system with two main types of health insurance: "State health insurance" known as sickness funds and "Private".

Provider compensation rates are negotiated in complex corporatist social bargaining among specified autonomously organized interest groups (e.g. physicians' associations) at the level of federal states. The sickness funds are mandated to provide a wide range of coverages and cannot refuse membership or otherwise discriminate on an actuarial basis.

Small numbers of persons are covered by tax-funded government employee insurance or social welfare insurance. Persons with incomes above the prescribed compulsory insurance level may opt into the sickness fund system, which a majority do, or purchase private insurance. Private supplementary insurance to the sickness funds of various sorts is available. Approximately 77% was government expenditure.

Japan

In Japan, services are provided either through regional/national public hospitals or through private hospitals/clinics, and patients have universal access to any facility, though hospitals tend to charge higher for those without a referral. Public health insurance covers most citizens/residents and pays 70% or more cost for each care and each prescribed drug. Patients are responsible for the remainder. There is the monthly insurance premium per household (scaled to annual income). Supplementary private health insurance is available only to cover the co-payments or non-covered costs, and usually makes a fixed payment per days in hospital or per surgery performed, rather than per actual expenditure. Approximately 83% was government expenditure.

Kuwait

Health-care is fairly developed, Kuwaitis receive medical services at government clinics and hospitals free of charge, the Non Kuwaitis pay nominal fees. Public health care is maintained by an intricate network of 72 primary health centers spread over the country, these provide general practitioner services, childcare, maternity care, diabetes care, dentistry, preventive medical care, nursing care and pharmaceuticals. Secondary health services are provided by six regional hospitals.

These provide surgical and general medical care, specialized clinics and dispensaries. Tertiary health care service centers include: Obstetrics for maternity, Chest, Psychiatric, Neurosurgery, Burns, Orthopedic and Allergy. Kuwait Cancer Control Center (KCCC) provides diagnosis and treatment for cancer patients. Hearing Impairments organs transplant, Physiotherapy and Rehabilitation have special care facilities. Beside government services there are a number of private clinics and hospitals in Kuwait. The Government monitors them, to ensure a high standard of services and regulates the fees charged. Most private hospitals have their own pharmacies. Most private hospitals are also general hospitals with some specialty departments.

Norway

Norway has a government run and government financed universal health care system, covering physical and mental health for all and dental health for children under the age of 16. Hospitals are free and doctor visit fees are capped at a fairly low rate. Medicine is market price, but there is a yearly cap for people with high medical expenses. Private health care exists: Dental care for adults has no public option, this is private only. Health-related plastic surgery (like burn damage) is covered by the public system, while cosmetic surgery in general is private. There is a number of private psychologists, there are also some private general practice doctors and specialists.

Public health care is financed by a special-purpose income tax on the order of 8-11% , loosely translated as "public benefits fee". This can be considered a mandatory public insurance, covering not only health care but also loss of income during sick leave, public pension, unemployment benefits, and benefits for single parents and a few others. The system is supposed to be self-financing from the taxes.

Norwegian citizens living in Norway are automatically covered, even if they never had taxable income. Norwegian citizens living and working abroad (taxable elsewhere and therefore not paying the "public benefits fee" to Norway are generally not covered, and must pay an estimated market cost for public health care services. The same goes for non-citizens like foreign visitors.

According to WHO, total health care expenditure in 2008 was 9% of GDP and paid 84% by government, 15% by private out-of-pocket and 1% by other private sources.

People's Republic of China

Mistaken political policies led to the starvation of millions during the Great Leap Forward; epidemic disease rebounded during the dislocations of the Cultural Revolution, which seriously harmed public health in China. The effective public health work in controlling epidemic disease during the early years of the PRC and, after reform began in 1978; the dramatic improvements in nutrition greatly improved the health and life expectancy of the Chinese people. The end of the famed "barefoot doctor" system was abolished in 1981. China is undertaking a reform on its health care system.

The New Rural Co-operative Medical Care System (NRCMCS) is a new 2005 initiative to overhaul the health care system, particularly intended to make it more affordable for the rural poor.

Under the NRCMCS, the annual cost of medical cover is 50 yuan (US$7) per person. Of that, 20 yuan is paid in by the central government, 20 yuan by the provincial government and a contribution of 10 yuan is made by the patient. As of September 2007, around 80% of the whole rural population of China had signed up (about 685 million people). The system is tiered, depending on the location.

If patients go to a small hospital or clinic in their local town, the scheme will cover from 70-80% of their bill. If they go to a county one, the % age of the cost being covered falls to about 60% .

And if they need specialist help in a large modern city hospital, they have to bear most of the cost themselves, the scheme would cover about 30% of the bill. Health care was provided in both rural and urban areas through a three-tiered system. In rural areas the first tier was made up of barefoot doctors working out of village medical centers. They provided preventive and primary-care services, with an average of two doctors per 1,000 people. At the next level were the township health centers, which functioned primarily as out-patient clinics for about 10,000 to 30,000 people each.

These centers had about ten to thirty beds each, and the most qualified members of the staff were assistant doctors. The two lower-level tiers made up the "rural collective health system" that provided most of the country's medical care. Only the most seriously ill patients were referred to the third and final tier, the county hospitals, which served 200,000 to 600,000 people each and were staffed by senior doctors who held degrees from 5-year medical schools.

Health care in urban areas was provided by paramedical personnel assigned to factories and neighborhood health stations. If more professional care was necessary the patient was sent to a district hospital, and the most serious cases were handled by municipal hospitals. To ensure a higher level of care, a number of state enterprises and government agencies sent their employees directly to district or municipal hospitals, circumventing the paramedical, or barefoot doctor, stage.

Singapore

Health care in Singapore is mainly under the responsibility of the Singapore Government's Ministry of Health. Singapore generally has an efficient and widespread system of health care.

It implements a universal health care system, and co-exists with private health care system. Infant mortality rate: in 2006 the crude birth rate stood at 10.1 per 1000, a very low level attributed to birth control policies, and the crude death rate was also one of the lowest in the world at 4.3 per 1000.

In 2006, the total fertility rate was only 1.26 children per woman, the 3rd lowest in the world and well below the 2.10 needed to replace the population. Singapore was ranked 6th in the World Health Organization's ranking of the world's health systems in the year 2000.

Singapore has a universal health care system where government ensures affordability, largely through compulsory savings and price controls, while the private sector provides most care. Overall spending on health care amounts to only 3% of annual GDP. Of that, 66% comes from private sources. Singapore currently has the lowest infant mortality rate in the world (equaled only by Iceland) and among the highest life expectancies from birth, according to the World Health Organization.

Singapore has "one of the most successful health care systems in the world, in terms of both efficiency in financing and the results achieved in community health outcomes," according to an analysis by global consulting firm Watson Wyatt. Singapore's system uses a combination of compulsory savings from payroll deductions (funded by both employers and workers) a nationalized catastrophic health insurance plan, and government subsidies. As well as "actively regulating the supply and prices of health care services in the country" to keep costs in check. The specific features have been described as potentially a "very difficult system to replicate in many other countries."

Many Singaporeans have supplemental private health insurance (often provided by employers) for services not covered by the government's programs. Singapore's well-established health care system comprises a total of 13 private hospitals, 10 public (government) hospitals and several specialist clinics, each specializing in and catering to different patient needs, at varying costs.

Patients are free to choose the providers within the government or private health care delivery system and can walk in for a consultation at any private clinic or any government polyclinic.

For emergency services, patients can go at any time to the 24-hour Accident & Emergency Departments located in the government hospitals. Singapore's medical facilities are among the finest in the world, with well qualified doctors and dentists, many trained overseas. Singapore has medical savings account system known as Medisave.

Sweden

In Sweden, the publicly funded medical system is comprehensive and compulsory. Physician and hospital services take a small patient fee, but their services are funded through the taxation scheme of the County Councils of Sweden. Approximately 82% was government expenditure.

Switzerland

In Switzerland, compulsory health insurance covers the costs of medical treatment and hospitalization of the insured. The Swiss healthcare system is a combination of public, subsidized private and totally private healthcare providers, where the insured person has full freedom of choice among the providers in his region. Insurance companies independently set their price points for different age groups, but are forbidden from setting prices based on health risk.

In 2000, Switzerland topped all European countries' health care expenditure when calculated as per capita expenditure in US dollar purchasing parity terms. The Swiss health care system is interesting as it was the last for-profit system in Europe. In the 1990s, after the private carriers began to deny coverage for pre-existing conditions – and when the uninsured population of Switzerland reached 5% – the Swiss held a referendum (1995) and adopted their present system.

Taiwan

The current health care system in Taiwan, known as National Health Insurance (NHI), was instituted in 1995. NHI is a single-payer compulsory social insurance plan which centralizes the disbursement of health care dollars. The system promises equal access to health care for all citizens, and the population coverage had reached 99% by the end of 2004. NHI is mainly financed through premiums, which are based on the payroll tax, and is supplemented with out-of-pocket payments and direct government funding.

In the initial stage, fee-for-service predominated for both public and private providers.

Most health providers operate in the private sector and form a competitive market on the health delivery side. However, many health care providers took advantage of the system by offering unnecessary services to a larger number of patients and then billing the government. In the face of increasing loss and the need for cost containment, NHI changed the payment system from fee-for-service to a global budget, a kind of prospective payment system, in 2002.

Thailand

Data on health care are out of date, but in 1995 Thailand had 0.3 physicians and 1.9 hospital beds per 1,000 population. In 2002 annual spending on health care amounted to US$321 per person in purchasing power parity (PPP). Total expenditures represented about 4.4 % of the gross domestic product (GDP); of this amount, 57.1 % came from public sources and 42.9% from private sources.

Some 85 % of the population had access to potable water in 2002, and 99 % had access to sanitation. Human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) is a serious problem in Thailand. The United Nations Programme on HIV/AIDS reported in November 2004 that the Thai government had launched a well-funded, politically supported, and pragmatic response to the epidemic. As a result, national adult HIV prevalence has decreased to an estimated 1.5 % of all persons aged 15 to 49 years (about 1.8 % of the total population). It was also reported that 58,000 adults and children had died from AIDS since the first case was reported in 1984.

The government has begun to improve its support to persons with HIV/AIDS and has provided funds to HIV/AIDS support groups. Public programs have begun to alter unsafe behavior, but discrimination against those infected continues. Highly pathogenic H5N1 avian influenza (bird flu) has been found among birds in Thailand as well as surrounding areas.

The government has pledged financial support for the prevention effort, which mainly focuses on changing poultry farming methods. Major infectious diseases in Thailand include bacterial diarrhea, hepatitis, dengue fever, malaria, Japanese encephalitis, rabies, and leptospirosis.

Thailand introduced universal coverage reforms in 2001, becoming one of only a handful of lower-middle income countries to do so. Means-tested health care for low income households was replaced by a new and more comprehensive insurance scheme, originally known as the 30 baht project, in line with the small co-payment charged for treatment.

People joining the scheme receive a gold card which allows them to access services in their health district, and, if necessary, be referred for specialist treatment elsewhere.

The bulk of finance comes from public revenues, with funding allocated to Contracting Units for Primary Care annually on a population basis. According to the WHO, 65% of Thailand's health care expenditure in 2018 came from the government, 35% was from private sources.

United Kingdom

Each of the four countries of the United Kingdom has a separate but co-operating National Health Service. They provide free physician and hospital services to all residents of the UK, funded from general taxation. Hospital staff are salaried employees according to nationally agreed contracts, whilst primary care is largely provided by independent practices, which are paid, again via nationally agreed contracts, according to the number of patients registered with them and the range of additional services offered. Prescription charges are levied by the health service in England, with exclusions for those who are not of working age (the young and the elderly). Wales has already abolished all prescription charges, and Northern Ireland and Scotland will have abolished all charges by 2010 and 2011 respectively. Private health services are also available. Private health care continues parallel to the NHS, paid for largely by private insurance. There are no private hospitals providing accident and emergency services. Most ambulance services are publicly run but some private and charity run ambulance services also exist. Approximately 87% was government expenditure.

United States

The United States is alone among developed nations in not having a universal health care system. Healthcare in the U.S. does, however, have significant publicly funded components. Roughly two thirds of urban hospitals in the U.S. are non-profit hospitals and the balance evenly divided between for-profit hospitals and public hospitals. The urban public hospitals are often associated with medical schools. The largest public hospital system in America is the New York City Health and Hospitals Corporation, which is associated with the New York University School of Medicine.

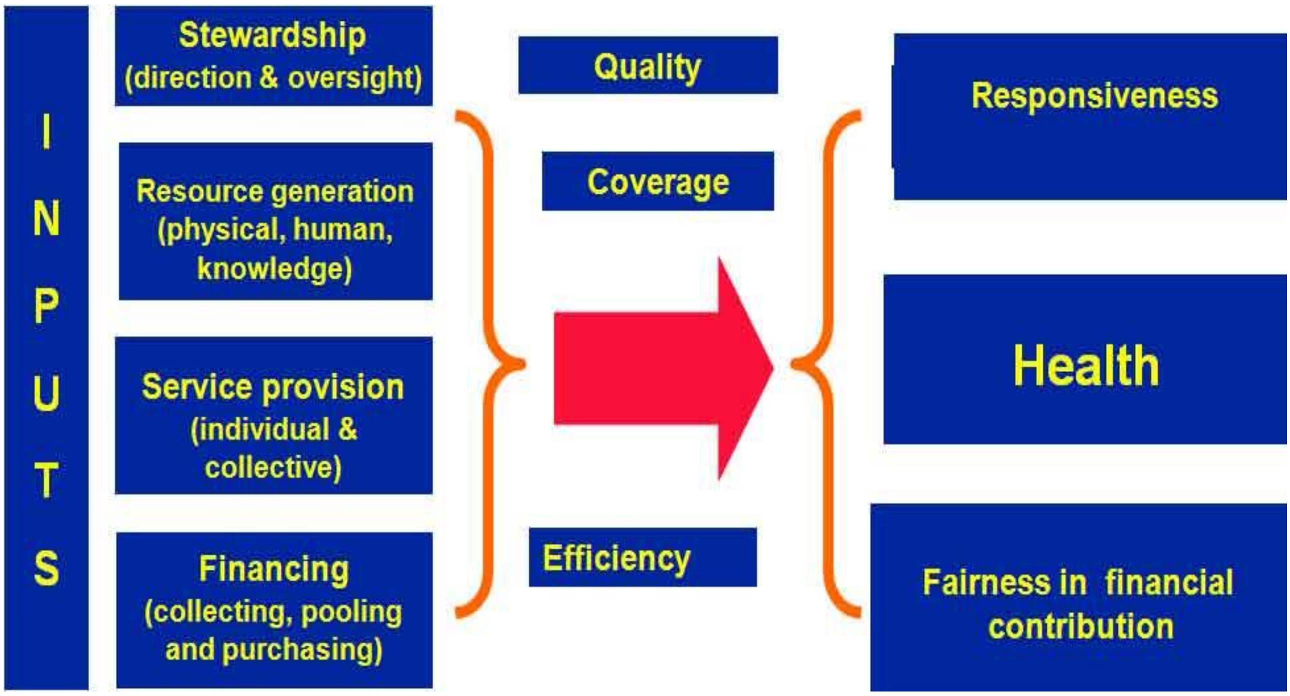
Although public hospitals constitute the greatest % age of non-federal hospitals, care in the U.S. is generally provided by physicians in private practice and private hospitals. Just over 59% of Americans receive health insurance through an employer, although this number is declining and the employee's expected contribution to these plans varies widely and is increasing as costs escalate.

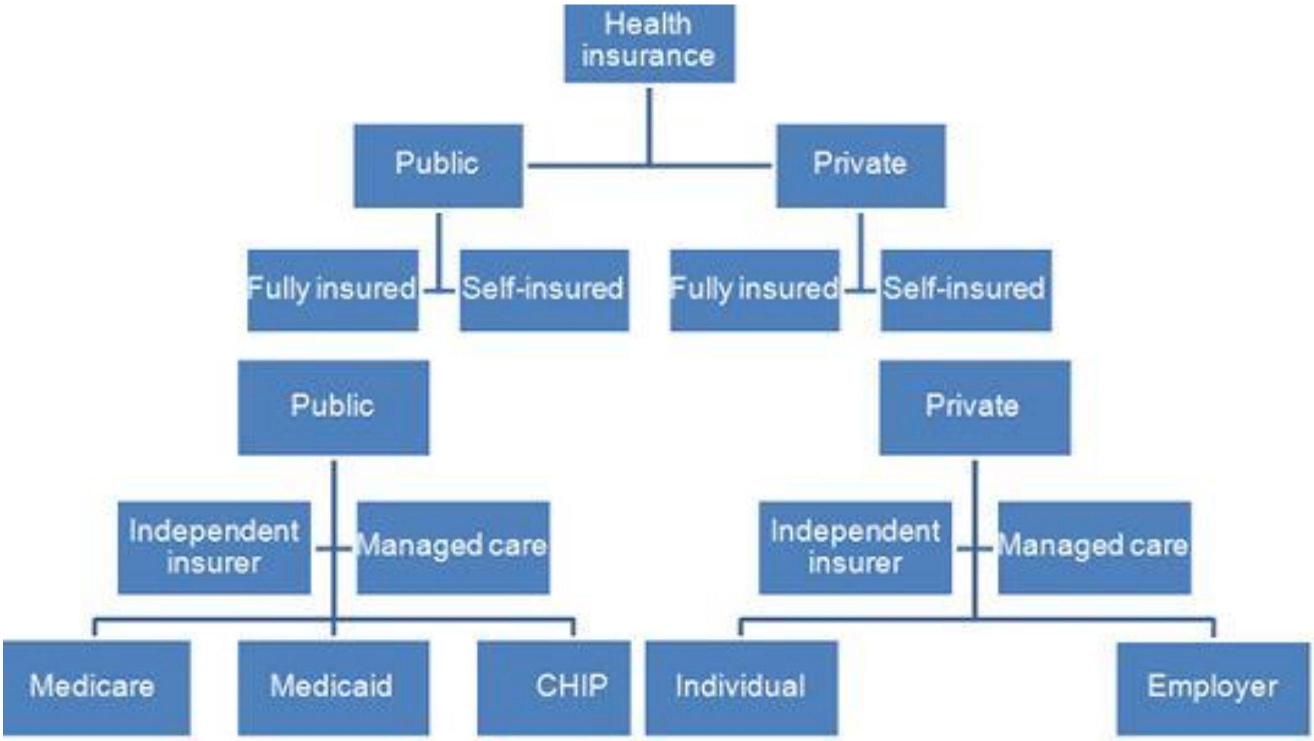
A significant number of people cannot obtain health insurance through their employer or are unable to afford individual coverage. A few states have taken serious steps toward universal health care coverage. Approximately 45% was government expenditure.

United Arab Emirates

Standards of health care are considered to be generally high in the United Arab Emirates, resulting from increased government spending during strong economic years. According to the UAE government, total expenditures on health care from 1996 to 2003 were US$436 million. According to the World Health Organization, in 2004 total expenditures on health care constituted 2.9 % of gross domestic product (GDP), and the per capita expenditure for health care was US$497. Health care currently is free only for UAE citizens. Effective January 2006, all residents of Abu Dhabi are covered by a new comprehensive health insurance program; costs will be shared between employers and employees. The number of doctors per 100,000 is 181.

The UAE now has 40 public hospitals, compared with only seven in 1970. The Ministry of Health is undertaking a multimillion-dollar program to expand health facilities, hospitals, medical centers, and a trauma center in the seven emirates. To attract wealthy UAE nationals and expatriates who traditionally have traveled abroad for serious medical care, Dubai is developing Dubai Healthcare City, a hospital free zone that will offer international-standard advanced private health care and provide an academic medical training center; completion is scheduled for 2010.





Health Insurance Classification

C H A P T E R IV. HISTORY OF BIOLOGY

UNIT I. GENERAL BIOLOGY

INTRODUCTION

The frontispiece to Erasmus Darwin's evolution-themed poem *The Temple of Nature* shows a goddess pulling back the veil from nature (in the person of Artemis). Allegory and metaphor have often played an important role in the history of biology. The history of biology traces the study of the living world from ancient to modern times. Although the concept of *biology* as a single coherent field arose in the 19th century, the biological sciences emerged from traditions of medicine and natural history reaching back to ancient Egyptian medicine and the works of Aristotle and Galen in the ancient Greco-Roman world, which were then further developed in the Middle Ages by Muslim physicians and scholars such as Avicenna, Avenzoar, Ibn al-Baitar and Ibn al-Nafis.

During the European Renaissance and early modern period, biological thought was revolutionized in Europe by a renewed interest in empiricism and the discovery of many novel organisms. Prominent in this movement were Vesalius and Harvey, who used experimentation and careful observation in physiology, and naturalists such as Linnaeus and Buffon who began to classify the diversity of life and the fossil record, as well as the development and behavior of organisms. Microscopy revealed the previously unknown world of microorganisms, laying the groundwork for cell theory.

The growing importance of natural theology, partly a response to the rise of mechanical philosophy, encouraged the growth of natural history (although it entrenched the argument from design). Over the 18th and 19th centuries, biological sciences such as botany and zoology became increasingly professional scientific disciplines. Lavoisier and other physical scientists began to connect the animate and inanimate worlds through physics and chemistry.

Explorer-naturalists such as Alexander von Humboldt investigated the interaction between organisms and their environment, and the ways this relationship depends on geography – laying the foundations for biogeography, ecology and ethology.

Naturalists began to reject essentialism and consider the importance of extinction and the mutability of species. Cell theory provided a new perspective on the fundamental basis of life.

These developments, as well as the results from embryology and paleontology, were synthesized in Charles Darwin's theory of evolution by natural selection. The end of the 19th century saw the fall of spontaneous generation and the rise of the germ theory of disease. Though the mechanism of inheritance remained a mystery.

In the early 20th century, the rediscovery of Mendel's work led to the rapid development of genetics by Thomas Hunt Morgan and his students, and by the 1930s the combination of population genetics and natural selection in the "neo-Darwinian synthesis". New disciplines developed rapidly, especially after Watson and Crick proposed the structure of DNA. Following the establishment of the Central Dogma and the cracking of the genetic code, biology was largely split between *organismal biology* – the fields that deal with whole organisms and groups of organisms – and the fields related to *cellular and molecular biology*.

By the late 20th century, new fields like genomics and proteomics were reversing this trend, with organismal biologists using molecular techniques, and molecular and cell biologists investigating the interplay between genes and the environment, as well as the genetics of natural populations of organisms.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Explain the etymology of the term «biology».

The word "*biology*" is formed by combining the Greek βίος (bios), meaning "life", and the suffix '-logy', meaning "science of", "knowledge of", "study of", based on the Greek verb λεγειν, 'legein' = "to select", "to gather" (cf. the noun λόγος, 'logos' = "word"). The term *biology* in its modern sense appears to have been introduced independently by Karl Friedrich Burdach (1800), Gottfried Reinhold Treviranus (*Biologie oder Philosophie der lebenden Natur*, 1802) & Jean-Baptiste Lamarck (*Hydroguologie*, 1802).

The word itself appears in the title of Volume 3 of Michael Christoph Hanov's *Philosophiae naturalis sive physicae dogmaticae: Geologia, biologia, phytologia generalis et dendrologia*, published in 1766. Before the term "*biology*", there were several terms used for the study of animals and plants. Natural history referred to the descriptive aspects of biology, though it also included mineralogy and other non-biological fields; from the Middle Ages through the Renaissance, the unifying framework of natural history was the *scala naturae* or Great Chain of Being.

Natural philosophy and natural theology encompassed the conceptual and metaphysical basis of plant and animal life, dealing with problems of why organisms exist and behave the way they do, though these subjects also included what is now geology, physics, chemistry, and astronomy. Physiology and (botanical) pharmacology were the province of medicine. Botany, zoology, and (in the case of fossils) geology replaced natural history and natural philosophy in the 18th and 19th centuries before biology was widely adopted.

Exercise 3. Define ancient Greek traditions.

The pre-Socratic philosophers asked many questions about life but produced little systematic knowledge of specifically biological interest – though the attempts of the atomists to explain life in purely physical terms would recur periodically through the history of biology. However, the medical theories of Hippocrates and his followers, especially humorism, had a lasting impact.

The philosopher Aristotle was the most influential scholar of the living world from classical antiquity. Though his early work in natural philosophy was speculative, Aristotle's later biological writings were more empirical, focusing on biological causation and the diversity of life. He made countless observations of nature, especially the habits and attributes of plants and animals in the world around him, which he devoted considerable attention to categorizing.

In all, Aristotle classified 540 animal species, and dissected at least 50. He believed that intellectual purposes, formal causes, guided all natural processes.

Aristotle, and nearly all Western scholars after him until the 18th century, believed that creatures were arranged in a graded scale of perfection rising from plants on up to humans: the *scala naturae* or Great Chain of Being. Aristotle's successor at the Lyceum, Theophrastus, wrote a series of books on botany – the *History of Plants* – which survived as the most important contribution of antiquity to botany, even into the Middle Ages.

Many of Theophrastus' names survive into modern times, such as *carpos* for fruit, and *pericarpion* for seed vessel. Pliny the Elder was also known for his knowledge of plants and nature, and was the most prolific compiler of zoological descriptions. A few scholars in the Hellenistic period under the Ptolemies – particularly Herophilus of Chalcedon and Erasistratus of Chios – amended Aristotle's physiological work, even performing experimental dissections and vivisections.

Claudius Galen became the most important authority on medicine and anatomy. Though a few ancient atomists such as Lucretius challenged the teleological Aristotelian viewpoint that all aspects of life are the result of design or purpose, teleology (and after the rise of Christianity, natural theology) would remain central to biological thought essentially until the 18th and 19th centuries.

Ernst W. Mayr argued that "Nothing of any real consequence happened in biology after Lucretius and Galen until the Renaissance." The ideas of the Greek traditions of natural history and medicine survived, but they were generally taken unquestioningly in medieval Europe.

Exercise 4. Remember the information above & below.

Exercise 5. Name medieval and islamic knowledge on the field.

A biomedical work by Ibn al-Nafis, an early adherent of experimental dissection who discovered the pulmonary circulation and coronary circulation.

The decline of the Roman Empire led to the disappearance or destruction of much knowledge, though physicians still incorporated many aspects of the Greek tradition into training and practice.

In Byzantium and the Islamic world, many of the Greek works were translated into Arabic and many of the works of Aristotle were preserved. Medieval Muslim physicians, scientists and philosophers made significant contributions to biological knowledge between the 8^{th} and 13^{th} centuries during what is known as the "Islamic Golden Age" or "Muslim Agricultural Revolution".

In zoology, for example, the Afro-Arab scholar al-Jahiz (781-869) described early evolutionary ideas such as the struggle for existence. He also introduced the idea of a food chain, and was an early adherent of environmental determinism. The Kurdish biologist Al-Dinawari (828-896) is considered the founder of Arabic botany for his *Book of Plants*, in which he described at least 637 plants and discussed plant evolution from its birth to its death, describing the phases of plant growth and the production of flowers and fruit. In anatomy and physiology, the Persian physician Rhazes (865-925) carried out an early experiment to discredit the Galenic theory of humorism.

In experimental medicine, the Persian physician Avicenna (980-1037) introduced clinical trials and clinical pharmacology in *The Canon of Medicine*, which remained an authoritative text in European medical education up until the 17th century. The Andalusian-Arabian physician Avenzoar (1091-1161) was an early adherent of experimental dissection and autopsy, which he carried out to prove that the skin disease scabies was caused by a parasite, a discovery which upset the theory of humorism. He also introduced experimental surgery, where animal testing is used to experiment with surgical techniques prior to using them on humans. During a famine in Egypt in 1200, Abd-el-latif observed and examined a large number of skeletons, and he discovered that Galen was incorrect regarding the formation of the bones of the lower jaw and sacrum.

In the early 13^{th} century, the Andalusian-Arabian biologist Abu al-Abbas al-Nabati developed an early scientific method for botany, introducing empirical and experimental techniques in the testing, description and identification of numerous materia medica, and separating unverified reports from those supported by actual tests and observations. His student Ibn al-Baitar (d. 1248) wrote a pharmaceutical encyclopedia describing 1,400 plants, foods, and drugs, 300 of which were his own original discoveries. A Latin translation of his work was useful to European biologists and pharmacists in the 18^{th} and 19^{th} centuries. The Arabian physician Ibn al-Nafis (1213-1288) was another early adherent of experimental dissection and autopsy, who in 1242, discovered the pulmonary circulation and coronary circulation, which form the basis of the circulatory system. He also described the concept of metabolism, and discredited the incorrect Galenic and Avicennian theories on the four humours, pulsation, bones, muscles, intestines, sensory organs, bilious canals, esophagus and stomach.

Exercise 6. Characterize the ancient and medieval knowledge on biology in early cultures.

The earliest humans must have had and passed on knowledge about plants and animals to increase their chances of survival. This may have included knowledge of human and animal anatomy and aspects of animal behavior (such as migration patterns). However, the first major turning point in biological knowledge came with the Neolithic Revolution about 10,000 years ago.

Humans first domesticated plants for farming, then livestock animals to accompany the resulting sedentary societies. The ancient cultures of Mesopotamia, Egypt, the Indian subcontinent, and China (among others) had sophisticated systems of philosophical, religious, and technical knowledge that encompassed the living world, and creation myths often centered on some aspect of life. However, the roots of modern biology are usually traced back to the secular tradition of ancient Greek philosophy.

Exercise 7. Classify Renaissance and early modern developments.

During the High Middle Ages, a few European scholars such as Hildegard of Bingen, Albertus Magnus and Frederick II expanded the natural history canon.

The rise of European universities, though important for the development of physics and philosophy, had little impact on biological scholarship. The European Renaissance brought expanded interest in both empirical natural history and physiology.

In 1543, Andreas Vesalius inaugurated the modern era of Western medicine with his seminal human anatomy treatise *De humani corporis fabrica*, which was based on dissection of corpses. Vesalius was the first in a series of anatomists who gradually replaced scholasticism with empiricism in physiology and medicine, relying on first-hand experience rather than authority and abstract reasoning. Via herbalism, medicine was also indirectly the source of renewed empiricism in the study of plants.

Otto Brunfels, Hieronymus Bock and Leonhart Fuchs wrote extensively on wild plants, the beginning of a nature-based approach to the full range of plant life. Bestiaries – a genre that combines both the natural and figurative knowledge of animals – became more sophisticated, especially with the work of William Turner, Pierre Belon, Guillaume Rondelet, Conrad Gessner, and Ulisse Aldrovandi.

Artists such as Albrecht Durer and Leonardo da Vinci, often working with naturalists, were also interested in the bodies of animals and humans, studying physiology in detail and contributing to the growth of anatomical knowledge. The traditions of alchemy and natural magic, especially in the work of Paracelsus, also laid claim to knowledge of the living world. Alchemists subjected organic matter to chemical analysis and experimented liberally with both biological and mineral pharmacology.

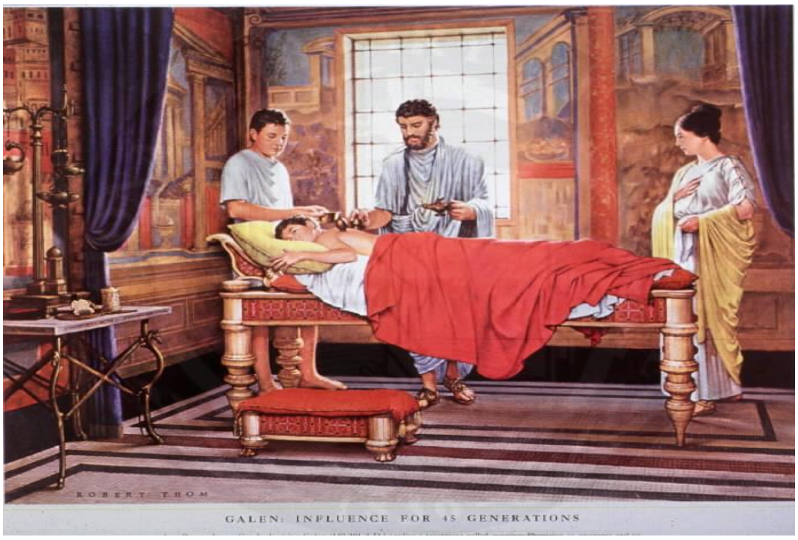
This was part of a larger transition in world views (the rise of the mechanical philosophy) that continued into the 17th century, as the traditional metaphor of *nature as organism* was replaced by the *nature as machine* metaphor.

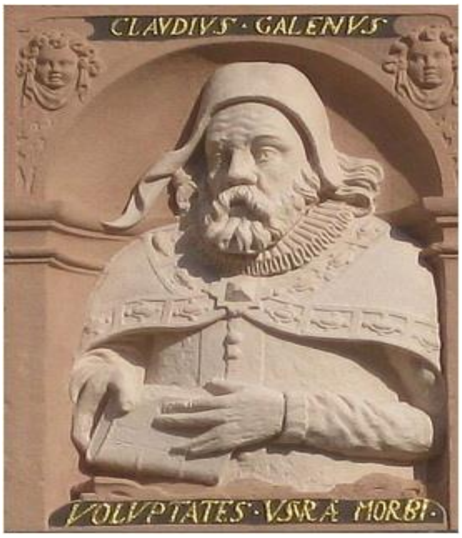
Exercise 8. Translate the single-root words into Russian.

Biology, space biology, cell biology, developmental biology, molecular (new) biology, radiation biology, developmental biology, space biology, satellite biology, biolysis, biologism, biologist, to biologize, biologic(al), biologically, biologicals, biologist, biolysis, biomedical, biomagnetism, biomarker, biomanipulation, biomass, biomaterial, biomedical engineering, biomedical implication, biomedical instrumentation, biomathematics, biomedicine, biometrics, biometrical identification.

Exercise 9. Translate the words and word-combinations into Russian.

Influential scholar; atomists; to explain; purely physical terms; medical theories; living world; countless observations; to focus on; diversity of life; the world around; successor; animal species; books on botany.





BIOLOGY IN THE 16TH & 18TH CENTURIES

Cabinets of curiosities, such as that of Ole Worm, were centers of biological knowledge in the early modern period, bringing organisms from across the world together in one place. Before the Age of Exploration, naturalists had little idea of the sheer scale of biological diversity. Extending the work of Vesalius into experiments on still living bodies (of both humans and animals), William Harvey and other natural philosophers investigated the roles of blood, veins and arteries.

Harvey's *De motu cordis* in 1628 was the beginning of the end for Galenic theory, alongside Santorio Santorio's studies of metabolism, it served as an influential model of quantitative approaches to physiology. In the early 17th century, the micro-world of biology was just beginning to open up.

A few lensmakers and natural philosophers had been creating crude microscopes since the late 16th century, and Robert Hooke published the seminal *Micrographia* based on observations with his own compound microscope in 1665. But it was not until Antony van Leeuwenhoek's dramatic improvements in lensmaking beginning in the 1670s – ultimately producing up to 200-fold magnification with a single lens – that scholars discovered spermatozoa, bacteria, infusoria and the sheer strangeness and diversity of microscopic life. Similar investigations by Jan Swammerdam led to new interest in entomology and built the basic techniques of microscopic dissection and staining. In *Micrographia*, Robert Hooke had applied the word *cell* to biological structures such as this piece of cork, but it was not until the 19th century that scientists considered cells the universal basis of life.

As the microscopic world was expanding, the macroscopic world was shrinking. Botanists such as John Ray worked to incorporate the flood of newly discovered organisms shipped from across the globe into a coherent taxonomy, and a coherent theology (natural theology).

Debate over another flood, the Noachian, catalyzed the development of paleontology.

In 1669 Nicholas Steno published an essay on how the remains of living organisms could be trapped in layers of sediment and mineralized to produce fossils. Although Steno's ideas about fossilization were well known and much debated among natural philosophers, an organic origin for all fossils would not be accepted by all naturalists until the end of the 18th century due to philosophical and theological debate about issues such as the age of the earth and extinction.

Systematizing, naming and classifying dominated natural history throughout much of the 17th and 18th centuries. Carolus Linnaeus published a basic taxonomy for the natural world in 1735 and in the 1750s introduced scientific names for all his species. While Linnaeus conceived of species as unchanging parts of a designed hierarchy, the other great naturalist of the 18th century, Georges-Louis Leclerc, Comte de Buffon, treated species as artificial categories and living forms as malleable – even suggesting the possibility of common descent.

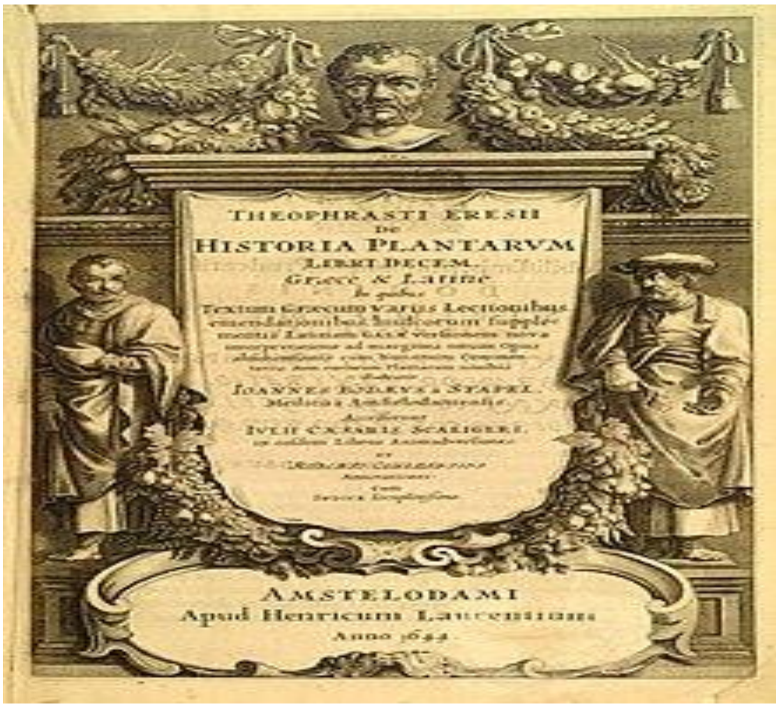
Though he was opposed to evolution, Buffon is a key figure in the history of evolutionary thought; his work would influence the evolutionary theories of both Lamarck and Darwin.

The discovery and description of new species and the collection of specimens became a passion of scientific gentlemen and a lucrative enterprise for entrepreneurs; many naturalists traveled the globe in search of scientific knowledge and adventure.

Exercise 1. Do you agree that 19th century – the emergence of biological disciplines?

Up through the nineteenth century, the scope of biology was largely divided between medicine, which investigated questions of form and function (physiology), and natural history, which was concerned with the diversity of life and interactions among different forms of life and between life and non-life.

By 1900, much of these domains overlapped, while natural history (icounterpart natural philosophy) had largely given way to more specialized scientific disciplines – cytology, bacteriology, morphology, embryology, geography, and geology. In the course of his travels, Alexander von Humboldt mapped the distribution of plants across landscapes and recorded a variety of physical conditions such as pressure and temperature.



Exercise* 2. *Name the relationship between natural history and natural philosophy.

Widespread travel by naturalists in the early- to mid-19th century resulted in a wealth of new information about the diversity and distribution of living organisms. Of particular importance was the work of A. von Humboldt, which analyzed the relationship between organisms and their environment (the domain of natural history) using the quantitative approaches of natural philosophy (i.e., physics and chemistry). Humboldt's work laid the foundations of biogeography and inspired several generations of scientists.

Exercise 3. Define the score of physiology.

Over the course of the 19th century, the scope of physiology expanded greatly, from a primarily medically-oriented field to a wide-ranging investigation of the physical and chemical processes of life – including plants, animals, and even microorganisms in addition to man.

Living things as machines became a dominant metaphor in biological (and social) thinking. Innovative laboratory glassware and experimental methods developed by Louis Pasteur and other biologists contributed to the young field of bacteriology in the late 19th century.

EVOLUTION & BIOGEOGRAPHY

The most significant evolutionary theory before Darwin's was that of Jean-Baptiste Lamarck; based on the inheritance of acquired characteristics (an inheritance mechanism widely accepted until the 20^{th} century), it described a chain of development stretching from the lowliest microbe to humans.

The British naturalist Charles Darwin, combining the biogeographical approach of Humboldt, the uniformitarian geology of Lyell, Thomas Malthus's writings on population growth, and his own morphological expertise, created a more successful evolutionary theory based on natural selection; similar evidence lead Alfred Russel Wallace to independently reach the same conclusions.

The 1859 publication of Darwin's theory in *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* is often considered the central event in the history of modern biology.

Darwin's established credibility as a naturalist, the sober tone of the work, and most of all the sheer strength and volume of evidence presented, allowed *Origin* to succeed where previous evolutionary works such as the anonymous *Vestiges of Creation* had failed. Most scientists were convinced of evolution and common descent by the end of the 19^{th} century. However, natural selection would not be accepted as the primary mechanism of evolution until well into the 20th century, as most contemporary theories of heredity seemed incompatible with the inheritance of random variation.

Wallace, following on earlier work by de Candolle, Humbolt and Darwin, made major contributions to zoogeography. Because of his interest in the transmutation hypothosis, he paid particular attention to the geographical distribution of closely allied species during his field work first in South America and then in the Malay archipelago.

While in the archipelago he identified the Wallace line, which runs through the spice islands dividing the fauna of the archipelago between an Asian zone and a New Guinea/Australian zone.

His key question, as to why the fauna of islands with such similar climates should be so different, could only be answered by considering their origin. In 1876 he wrote *The geographical distribution of animals*, which was the standard reference work for over half a century, and a sequel, *Island Life*, in 1880 that focused on island biogeography. He extended the 6 zone system developed by Philip Sclater for describing the geographical distribution of birds to animals of all kinds.

His method of tabulating data on animal groups in geographic zones highlighted the discontinuities; and his appreciation of evolution allowed him to propose rational explanations, which had not been done before. The scientific study of heredity grew rapidly in the wake of Darwin's *Origin of Species* with the work of Francis Galton and the biometricians. The origin of genetics is usually traced to the 1866 work of the monk Gregor Mendel, who would later be credited with the laws of inheritance. However, his work was not recognized as significant until 35 years afterward. In the meantime, a variety of theories of inheritance were debated and investigated vigorously.

Embryology and ecology also became central biological fields, especially as linked to evolution and popularized in the work of Ernst Haeckel. Most of the 19th century work on heredity, however, was not in the realm of natural history, but that of experimental physiology.

Exercise 1. Render the interaction between the evolution and biogeography.

Exercise 2. Translate the words and phrases and draw up sentences with them.

Nature, human (impetuous) nature, Mother Nature, placid (better) nature, things of this nature, documents of a confidential nature, call of nature, pay debt to nature, in the course of nature, against nature, in the nature of the case, in the nature of things, to draw from nature, all nature, to beat all nature, stochastic nature, statistical nature, one-off nature, to occur in nature, nature or nurture? Nature's engineering, ill nature, one's true nature, by nature, things of this nature, habit is second nature, nature abhors a vacuum, nature will have its course, second nature, better nature, the laws/beauties of nature, the diversity of nature, Mother Nature, second nature.

Exercise* 3. *Characterize the essentials of the geology and paleontology.

The emerging discipline of geology also brought natural history and natural philosophy closer together; the establishment of the stratigraphic column linked the spacial distribution of organisms to their temporal distribution, a key precursor to concepts of evolution. Georges Cuvier and others made great strides in comparative anatomy and paleontology in the late 1790s and early 1800s. In a series of lectures and papers that made detailed comparisons between living mammals and fossil remains Cuvier was able to establish that the fossils were remains of species that had become extinct – rather than being remains of species still alive elsewhere in the world, as had been widely believed.

Fossils discovered and described by Gideon Mantell, William Buckland, Mary Anning, and Richard Owen among others helped establish that there had been an "age of reptiles" that had preceded even the prehistoric mammals. These discoveries captured the public imagination and focused attention on the history of life on earth. Charles Lyell's influential *Principles of Geology* (1830) popularised Hutton's uniformitarianism, a theory that explained the geological past and present on equal terms.

Exercise 4. Describe the cell theory, embryology and germ theory.

Advances in microscopy also had a profound impact on biological thinking.

In the early 19th century, a number of biologists pointed to the central importance of the cell. In 1838 and 1839, Schleiden and Schwann began promoting the ideas that (1) the basic unit of organisms is the cell and (2) that individual cells have all the characteristics of life, though they opposed the idea that (3) all cells come from the division of other cells.

Thanks to the work of Robert Remak and Rudolf Virchow, however, by the 1860s most biologists accepted all three tenets of what came to be known as cell theory. Cell theory led biologists to re-envision individual organisms as interdependent assemblages of individual cells. Scientists in the rising field of cytology, armed with increasingly powerful microscopes and new staining methods, soon found that even single cells were far more complex than the homogeneous fluid-filled chambers described by earlier microscopists. Robert Brown had described the nucleus in 1831, and by the end of the 19th century cytologists identified many of the key cell components: chromosomes, centrosomes mitochondria, chloroplasts, and other structures made visible through staining.

Between 1874 and 1884 Walther Flemming described the discrete stages of mitosis, showing that they were not artifacts of staining but occurred in living cells, and moreover, that chromosomes doubled in number just before the cell divided and a daughter cell was produced. Much of the research on cell reproduction came together in August Weismann's theory of heredity: he identified the nucleus (in particular chromosomes) as the hereditary material, proposed the distinction between somatic cells and germ cells (arguing that chromosome number must be halved for germ cells, a precursor to the concept of meiosis), and adopted Hugo de Vries's theory of pangenes.

Weismannism was extremely influential, especially in the new field of experimental embryology.

By the mid 1850s the miasma theory of disease was largely superseded by the germ theory of disease, creating extensive interest in microorganisms and their interactions with other forms of life.

By the 1880s, bacteriology was becoming a coherent discipline, especially through the work of Robert Koch, who introduced methods for growing pure cultures on agar gels containing specific nutrients in Petri dishes. The long-held idea that living organisms could easily originate from nonliving matter (spontaneous generation) was attacked in a series of experiments carried out by Louis Pasteur, while debates over vitalism vs. mechanism (a perennial issue since the time of Aristotle and the Greek atomists) continued apace.

Exercise 5. Make up some dialogues from the information above.

Exercise 6. Render the main idea of the information.

Exercise 7. Add some in formation and make up a small report and give a talk in class.

Lui Paster in his laboratory

Exercise 8. Explain the rise of organic chemistry and experimental physiology.

In chemistry, one central issue was the distinction between organic and inorganic substances, especially in the context of organic transformations such as fermentation and putrefaction.

Since Aristotle these had been considered essentially biological (*vital*) processes.

However, Friedrich Wöhler, Justus Liebig and other pioneers of the rising field of organic chemistry – building on the work of Lavoisier – showed that the organic world could often be analyzed by physical and chemical methods. In 1828 Wöhler showed that the organic substance urea could be created by chemical means that do not involve life, providing a powerful argument against vitalism.

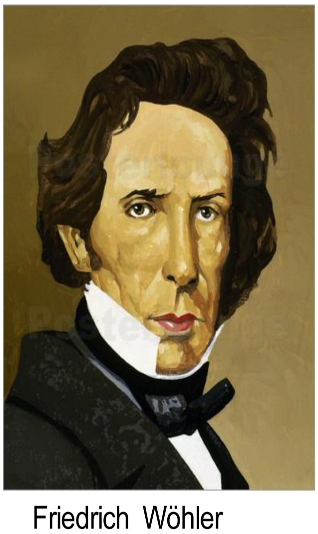
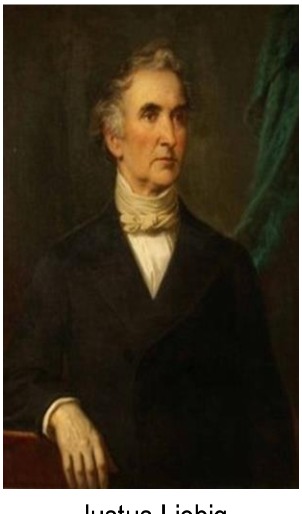
Cell extracts ("ferments") that could effect chemical transformations were discovered, beginning with diastase in 1833, and by the end of the 19th century the concept of enzymes was well established, though equations of chemical kinetics would not be applied to enzymatic reactions until the early 20th century. Physiologists such as Claude Bernard explored (through vivisection and other experimental methods) the chemical and physical functions of living bodies to an unprecedented degree, laying the groundwork for endocrinology (a field that developed quickly after the discovery of the first hormone, secretin, in 1902), biomechanics, and the study of nutrition and digestion. The importance and diversity of experimental physiology methods, within both medicine and biology, grew dramatically over the second half of the 19th century. The control and manipulation of life processes became a central concern, and experiment was placed at the center of biological education.

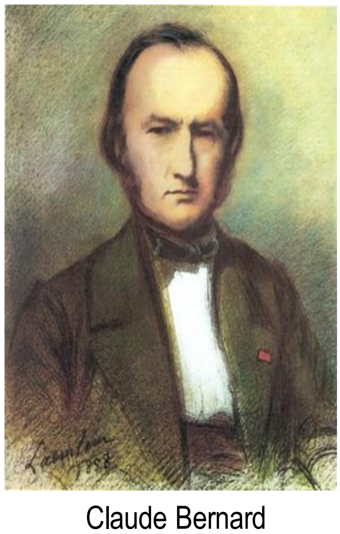
Exercise 9. Classify the 20th century biological sciences.

At the beginning of the 20th century, biological research was largely a professional endeavour. Most work was still done in the natural history mode, which emphasized morhphological and phylogenetic analysis over experiment-based causal explanations. However, anti-vitalist experimental physiologists and embryologists, especially in Europe, were increasingly influential. The tremendous success of experimental approaches to development, heredity, and metabolism in the 1900s and 1910s demonstrated the power of experimentation in biology. In the following decades, experimental work replaced natural history as the dominant mode of research.

Exercise 10. Transfer the given information from the passages onto a table.

№	**Activity**			
	Who	**When**	**Where**	**Score**
1.				



Friedrich Wöhler Justus Liebig Lavoisier Claude Bernard

Exercise 11. Find common traits between ecology and environmental science.

In the early 20th century, naturalists were faced with increasing pressure to add rigor and preferably experimentation to their methods, as the newly prominent laboratory-based biological disciplines had done. Ecology had emerged as a combination of biogeography with the biogeochemical cycle concept pioneered by chemists; field biologists developed quantitative methods such as the quadrat and adapted laboratory instruments and cameras for the field to further set their work apart from traditional natural history. Zoologists and botanists did what they could to mitigate the unpredictability of the living world, performing laboratory experiments and studying semi-controlled natural environments such as gardens; new institutions provided more controlled environments for studying organisms through their entire life cycles.

The ecological succession concept, pioneered in the 1900s and 1910s by Henry Chandler Cowles and Frederic Clements, was important in early plant ecology. Alfred Lotka's predator-prey equations, G. Evelyn Hutchinson's studies of the biogeography and biogeochemical structure of lakes and rivers (limnology) and Charles Elton's studies of animal food chains were pioneers among the succession of quantitative methods that colonized the developing ecological specialties.

Ecology became an independent discipline in the 1940s and 1950s after Eugene P. Odum synthesized many of the concepts of ecosystem ecology, placing relationships between groups of organisms (especially material and energy relationships) at the center of the field.

In the 1960s, as evolutionary theorists explored the possibility of multiple units of selection, ecologists turned to evolutionary approaches. In population ecology, debate over group selection was brief but vigorous; by 1970, most biologists agreed that natural selection was rarely effective above the level of individual organisms. The evolution of ecosystems, however, became a lasting research focus.

Ecology expanded rapidly with the rise of the environmental movement. the International Biological Program attempted to apply the methods of big science to ecosystem ecology and pressing environmental issues, while smaller-scale independent efforts such as island biogeography helped redefine the scope of an increasingly diverse discipline.

Exercise 12. Characterize the interaction between biochemistry, microbiology, molecular biology.

By the end of the 19th century all of the major pathways of drug metabolism had been discovered, along with the outlines of protein and fatty acid metabolism and urea synthesis.

In the early decades of the twentieth century, the minor components of foods in human nutrition, the vitamins, began to be isolated and synthesized. Improved laboratory techniques such as chromatography and electrophoresis led to rapid advances in physiological chemistry, which – as *biochemistry* – began to achieve independence from its medical origins. In the 1920s and 1930s, biochemists – led by Hans Krebs and Carl and Gerty Cori – began to work out many of the central metabolic pathways of life: the citric acid cycle, glycogenesis and glycolysis, and the synthesis of steroids and porphyrins. Between the 1930s and 1950s, Fritz Lipmann and others established the role of ATP as the universal carrier of energy in the cell, and mitochondria as the powerhouse of the cell. Such traditionally biochemical work continued to be very actively pursued throughout the 20th century and into the 21st.

Exercise 13. Give the score of classical genetics, the modern synthesis, and evolutionary theory.

Thomas Hunt Morgan's illustration of crossing over, part of the Mendelian-chromosome theory of heredity 1900 marked the so-called *rediscovery of Mendel*: Hugo de Vries, Carl Correns, and Erich von Tschermak independently arrived at Mendel's laws (which were not actually present in Mendel's work).

Soon after, cytologists (cell biologists) proposed that chromosomes were the hereditary material. Between 1910 and 1915, Thomas Hunt Morgan and the "Drosophilists" in his fly lab forged these two ideas – both controversial – into the "Mendelian-chromosome theory" of heredity. They quantified the phenomenon of genetic linkage and postulated that genes reside on chromosomes like beads on string; they hypothesized crossing over to explain linkage and constructed genetic maps of the fruit fly *Drosophila melanogaster*, which became a widely used model organism.

Hugo de Vries tried to link the new genetics with evolution; building on his work with heredity and hybridization, he proposed a theory of mutationism, which was widely accepted in the early 20th century. Lamarckism also had many adherents.

Darwinism was seen as incompatible with the continuously variable traits studied by biometricians, which seemed only partially heritable. In the 1920s and 1930s – following the acceptance of the Mendelian-chromosome theory – the emergence of the discipline of population genetics, with the work of R.A. Fisher, J.B.S. Haldane and Sewall Wright, unified the idea of evolution by natural selection with Mendelian genetics, producing the modern synthesis. The inheritance of acquired characters was rejected, while mutationism gave way as genetic theories matured.

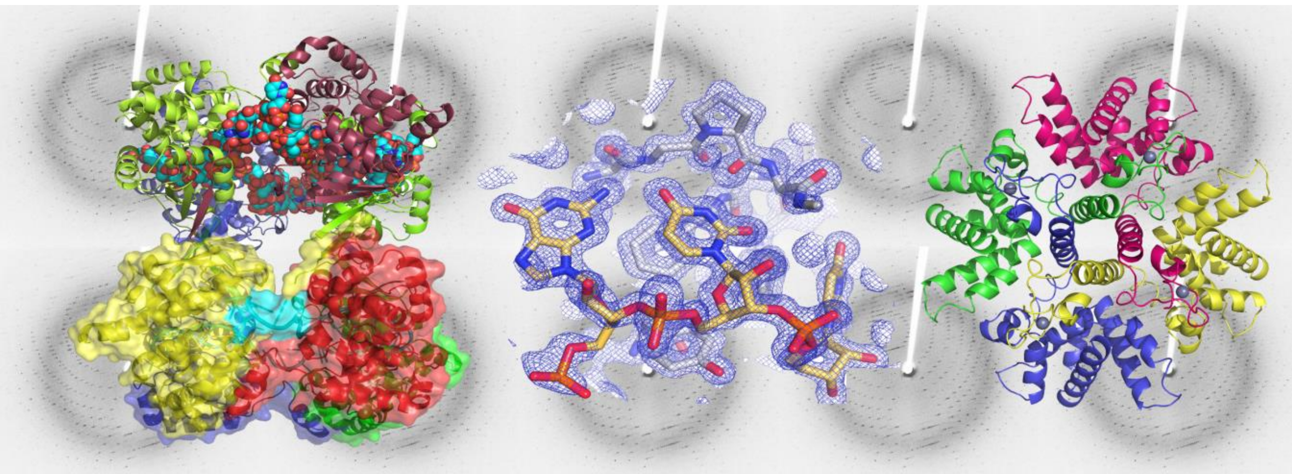
In the second half of the century the ideas of population genetics began to be applied in the new discipline of the genetics of behavior, sociobiology, and, especially in humans, evolutionary psychology. In the 1960s W.D. Hamilton and others developed game theory approaches to explain altruism from an evolutionary perspective through kin selection.

The possible origin of higher organisms through endosymbiosis, and contrasting approaches to molecular evolution in the gene-centered view (which held selection as the predominant cause of evolution) and the neutral theory (which made genetic drift a key factor) spawned perennial debates over the proper balance of adaptationism and contingency in evolutionary theory.

In the 1970s Stephen Jay Gould and Niles Eldredge proposed the theory of punctuated equilibrium which holds that stasis is the most prominent feature of the fossil record, and that most evolutionary changes occur rapidly over relatively short periods of time.

In 1980 Luis Alvarez and Walter Alvarez proposed the hypothesis that an impact event was responsible for the Cretaceous-Tertiary extinction event. Also in the early 1980s, statistical analysis of the fossil record of marine organisms published by Jack Sepkoski and David M. Raup lead to a better appreciation of the importance of mass extinction events to the history of life on earth.

Exercise 14. Write out all words and phrases according to the topic.



MOLECULAR BIOLOGY

Following the rise of classical genetics, many biologists – including a new wave of physical scientists in biology – pursued the question of the gene and its physical nature.

Warren Weaver – head of the science division of the Rockefeller Foundation – issued grants to promote research that applied the methods of physics and chemistry to basic biological problems, coining the term *molecular biology* for this approach in 1938; many of the significant biological breakthroughs of the 1930s and 1940s were funded by the Rockefeller Foundation.

Wendell Stanley's crystallization of tobacco mosaic virus as a pure nucleoprotein in 1935 convinced many scientists that heredity might be explained purely through physics and chemistry. Like biochemistry, the overlapping disciplines of bacteriology and virology (later combined as *microbiology*), situated between science and medicine, developed rapidly in the early 20th century.

Felix d'Herelle's isolation of bacteriophage during World War I initiated a long line of research focused on phage viruses and the bacteria they infect.

The development of standard, genetically uniform organisms that could produce repeatable experimental results was essential for the development of molecular genetics.

After early work with *Drosophila* and maize, the adoption of simpler model systems like the bread mold *Neurospora crassa* made it possible to connect genetics to biochemistry, most importantly with Beadle and Tatum's "one gene, one enzyme" hypothesis in 1941.

Genetics experiments on even simpler systems like tobacco mosaic virus and bacteriophage, aided by the new technologies of electron microscopy and ultracentrifugation, forced scientists to re-evaluate the literal meaning of life; virus heredity and reproducing nucleoprotein cell structures outside the nucleus ("plasmagenes") complicated the accepted Mendelian-chromosome theory.

The "central dogma of molecular biology" (originally a "dogma" only in jest) was proposed by Francis Crick in 1958. This is Crick's reconstruction of how he conceived of the central dogma at the time. The solid lines represent (as it seemed in 1958) known modes of information transfer, and the dashed lines represent postulated ones.

Oswald Avery showed in 1943 that DNA was likely the genetic material of the chromosome, not its protein; the issue was settled decisively with the 1952 Hershey-Chase experiment The "central dogma of molecular biology" (originally a "dogma" only in jest) was proposed by Francis Crick in 1958.

This is Crick's reconstruction of how he conceived of the central dogma at the time.

The solid lines represent (as it seemed in 1958) known modes of information transfer, and the dashed lines represent postulated ones. Oswald Avery showed in 1943 that DNA was likely the genetic material of the chromosome, not its protein; the issue was settled decisively with the 1952 Hershey-Chase experiment – one of many contribution by Max Delbrick.

In 1953 James D. Watson and Francis Crick, building on the work of Maurice Wilkins and Rosalind Franklin, suggested that the structure of DNA was a double helix.

In their famous paper "Molecular structure of Nucleic Acids", Watson and Crick noted coyly, "It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material."

After the 1958 Meselson-Stahl experiment confirmed the semiconservative replication of DNA, it was clear to most biologists that nucleic acid sequence must somehow determine amino acid sequence in proteins; physicist George Gamow proposed that a fixed genetic code connected proteins and DNA. Between 1953 and 1961, there were few known biological sequences – either DNA or protein – but an abundance of proposed code systems, a situation made even more complicated by expanding knowledge of the intermediate role of RNA. It took an extensive series of experiments in biochemistry and bacterial genetics, between 1961 and 1966.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Make up some dialogues from the information above.

Exercise 3. Render the origins of molecular biology given in the information below.

Exercise 4. Explain the expansion of molecular biology.

In addition to the Division of Biology at Caltech, the Laboratory of Molecular Biology (and its precursors) at Cambridge, and a handful of other institutions, the Pasteur Institute became a major center for molecular biology research in the late 1950s.

Scientists at Cambridge, led by Max Perutz and John Kendrew, focused on the rapidly developing field of structural biology, combining X-ray crystallography with molecular modelling and the new computational possibilities of digital computing (benefiting both directly and indirectly from the military funding of science). A number of biochemists led by Fred Sanger later joined the Cambridge lab, bringing together the study of macromolecular structure and function.

At the Pasteur Institute, François Jacob and Jacques Monod followed the 1959 PaJaMo experiment with a series of publications regarding the *lac* operon that established the concept of gene regulation and identified what came to be known as messenger RNA. By the mid-1960s, the intellectual core of molecular biology – a model for the molecular basis of metabolism and reproduction – was largely complete.

The late 1950s to the early 1970s was a period of intense research and institutional expansion for molecular biology, which had only recently become a somewhat coherent discipline. In what organismic biologist E. O. Wilson called "The Molecular Wars", the methods and practitioners of molecular biology spread rapidly, often coming to dominate departments and even entire disciplines.

Molecularization was particularly important in genetics, immunology, embryology, and neurobiology, while the idea that life is controlled by a "genetic program" – a metaphor Jacob and Monod introduced from the emerging fields of cybernetics and computer science – became an influential perspective throughout biology.

Immunology in particular became linked with molecular biology, with innovation flowing both ways: the clonal selection theory developed by Niels Jerne and Frank Macfarlane Burnet in the mid 1950s helped shed light on the general mechanisms of protein synthesis.

Resistance to the growing influence of molecular biology was especially evident in evolutionary biology. Protein sequencing had great potential for the quantitative study of evolution (through the molecular clock hypothesis), but leading evolutionary biologists questioned the relevance of molecular biology for answering the big questions of evolutionary causation.

Departments and disciplines fractured as organismic biologists asserted their importance and independence: Theodosius Dobzhansky made the famous statement that "nothing in biology makes sense except in the light of evolution" as a response to the molecular challenge.

The issue became even more critical after 1968. Motoo Kimura's neutral theory of molecular evolution suggested that natural selection was not the ubiquitous cause of evolution, at least at the molecular level, and that molecular evolution might be a fundamentally different process from morphological evolution. Resolving this "molecular/morphological paradox" has been a central focus of molecular evolution research since the 1960s.

Exercise 5. Describe molecular systematics and genomics.

Inside of a 48-well thermal cycler, a device used to perform polymerase chain reaction on many samples at once. By the 1980s, protein sequencing had already transformed methods of scientific classification of organisms (especially cladistics) but biologists soon began to use RNA and DNA sequences as characters; this expanded the significance of molecular evolution within evolutionary biology, as the results of molecular systematics could be compared with traditional evolutionary trees based on morphology.

Exercise 6. Analyze the information, which is in the highlight, and use it in practice.

BIOTECHNOLOGY & GENETIC ENGINEERING

Biotechnology in the modern sense of genetic engineering began in the 1970s, with the invention of recombinant DNA techniques. Restriction enzymes were discovered and characterized in the late 1960s, following on the heels of the isolation, then duplication, then synthesis of viral genes.

Beginning with the lab of Paul Berg in 1972 (aided by *EcoRI* from Herbert Boyer's lab, building on work with ligase by Arthur Kornberg's lab), molecular biologists put these pieces together to produce the first transgenic organisms. Soon after, others began using plasmid vectors and adding genes for antibiotic resistance, greatly increasing the reach of the recombinant techniques.

Wary of the potential dangers (particularly the possibility of a prolific bacteria with a viral cancer-causing gene), the scientific community as well as a wide range of scientific outsiders reacted to these developments with both enthusiasm and fearful restraint. Prominent molecular biologists led by Berg suggested a temporary moratorium on recombinant DNA research until the dangers could be assessed and policies could be created. This moratorium was largely respected, until the participants in the 1975 Asilomar Conference on Recombinant DNA created policy recommendations and concluded that the technology could be used safely.

Following Asilomar, new genetic engineering techniques and applications developed rapidly. DNA sequencing methods improved greatly (pioneered by Fred Sanger and Walter Gilbert), as did oligonucleotide synthesis and transfection techniques. Researchers learned to control the expression of transgenes, and were soon racing to create organisms capable of expressing human genes for the production of human hormones.

However, this was a more daunting task than molecular biologists had expected; developments between 1977 and 1980 showed that, due to the phenomena of split genes and splicing, higher organisms had a much more complex system of gene expression than the bacteria models of earlier studies. The first such race, for synthesizing human insulin, was won by Genentech. This marked the beginning of the biotech boom (with it, the era of gene patents), with an unprecedented level of overlap between biology, industry, and law.

Following the pioneering ideas of Lynn Margulis on endosymbiotic theory, which holds that some of the organelles of eukaryotic cells originated from free living prokaryotic organisms through symbiotic relationships, even the overall division of the tree of life was revised.

Into the 1990s, the five domains (Plants, Animals, Fungi, Protists, and Monerans) became three (the Archaea, the Bacteria, and the Eukarya) based on Carl Woese's pioneering molecular systematics work with 16S rRNA sequencing. The development and popularization of the polymerase chain reaction (PCR) in mid 1980s (by Kary Mullis) marked another watershed in the history of modern biotechnology, greatly increasing the ease and speed of genetic analysis. Coupled with the use of expressed sequence tags, PCR led to the discovery of many more genes than could be found through traditional biochemical or genetic methods and opened the possibility of sequencing entire genomes.

The unity of much of the morphogenesis of organisms from fertilized egg to adult began to be unraveled after the discovery of the homeobox genes, first in fruit flies, then in other insects and animals, including humans. These developments led to advances in the field of evolutionary developmental biology towards understanding how the various body plans of the animal phyla have evolved and how they are related to one another.

The Human Genome Project – the largest, most costly single biological study ever undertaken – began in 1988 under the leadership of James D. Watson, after preliminary work with genetically simpler model organisms such as *E. coli*, *S. cerevisiae* and *C. elegans*. Shotgun sequencing and gene discovery methods pioneered by Craig Venter – and fueled by the financial promise of gene patents with Celera Genomics – led to a public-private sequencing competition that ended in compromise with the first draft of the human DNA sequence announced in 2000.

Exercise 1. Explain the notion on recombinant DNA with the help of the information.

EVOLUTION

People have always been curious about the creator of all animals and plants. There have been many divine theories about how people came into being. However, research findings have proved that all animals including human beings have evolved from primitive ancestors.

In 1859 Charles Darwin put forward his theory of evolution which claimed that all animals changed and developed during a continuous process. This process is brought about by the species gradually adapting to the demands of its environment, through a gradual genetic change.

To understand this complicated process some theoretical background is necessary. Inside each of our body's cells, there is a complex substance known as DNA. It looks like a very twisted ladder and its full name is deoxyribonucleic acid. Sections of DNA are known as genes.

They give instructions about when different types of cells should develop, and whereabouts in the body they should be. DNA bears the genetic code which is a tremendously complicated set of instructions to the cells in the body, so that they will know how to develop.

As a result of these complex instructions, we develop specialized liver cells, heart cells, hair cells, skin cells, and all other different types of cells which make up a body. Larger strands of DNA are known as chromosomes. They are arranged in pairs. However, an ovum, a female cell capable of developing into a baby as well as a male cell which should fertilize it have only half of the chromosomes. In this way, when organisms reproduce themselves sexually, – by combining sperm from one parent with ova from another, – the new individual possesses characteristics of both parents.

The new combination of characteristics may be particularly beneficial.The child may inherit the very best features of its parents and be healthier, stronger and fitter. Sometimes, there are slight mistakes made in the copying. When the special reproductive cells are made, and these can result in the new individual being different in someway. These mistakes are known as genetic mutations and sometimes are very beneficial. When these beneficial changes occur, evolution happens.

Every organism is in competition with other members of its species. So anything which helps this plant or animal to get an edge over the competition will be useful. The individuals with beneficial characteristics are more likely to survive if some natural change happens. This is known as natural selection which is all about the survival of the fittest – and the fittest is the one which is best adapted to its environment. It should be clear now that it is a mistake to think of evolution as a straight-line development leading up to the human being. This is only one of many different branches of evolution.

Exercise 1. Digest the score of the information briefly in English.

Exercise 2. Answer the questions.

1. Do you believe that God created the Universe? 2. Do you agree with Darwin's theory? Justify your answer. 3. Is the gradual development of the human being the main achievement of evolution? Justify your answer.

Exercise 3. Make up sentences using the words and translate them into Russian:

1. Scientists, today, many, a lot of, do research. 2. Smallest, these, they, particles, called, atoms. 3. Nineteenth, beginning, the, of, scientists, established, the, at, of, first, theory, the, experimentally, of, the, structure, atomic, matter, century. 4. Scientists, establish, did, the, when, atomic, of, theory, matter, of, structure, the? 5. Atoms, state, in, molecules, rapid, a, are, motion, and, of?

Exercise 4. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 5. Read the text "Origin of Life" & pick up the essential details in the form of quick notes.

About 100 years ago F. Engels defined life as the "mode of motion of a albuminous substances". Modern sciences succeeded in tracing the stages of the evolution of life from a barren, entirely inorganic earth through the formation of organic compounds, their polymerization to giant-chained molecules of proteins and nucleic acids, the formation of living cells and the whole process of Darwinian evolution to man. Polymeric compounds are chemical substances composed of the same elements in the same proportion but with different molecular weights. They are liquid or gaseous substances with small molecules (C2H2 – acetylene, C6H6 – benzine).

Scientists have found ways of joining the small molecules together into long chains thus forming a solid with various properties of polythene or other plastic. A similar process of the formation of long-chain molecules from small ones goes on in living cells. Proteins and amino-acids are the building bricks of the living matter. Living organisms produce proteins from the food they absorb. There are several hundred proteins. They are made from about 20 simpler molecules called the amino-acids.

The amino-acids are joined nose to tail as are the molecules in polythene. But the structure of the chains in proteins is much more complicated than in polythene. Each type of protein is made of a precise number of each kind of amino-acid. There is even precise order in which each simple molecule joins the chain. Chemists are unable to produce such polymers yet.

Still we are getting some insight into the structure of natural polymers. We are beginning to understand the structure of chromosomes – thread-like parts of the cell dictating the order in which the various smaller molecules join together to make the long-chain nucleic acids RNA and DNA. RNA and DNA carry the genetic code which plays a big role in the process of heredity. We cannot yet answer the question when life began. It must have started with the development of self-replicating polymers.

Exercise 6. Translate into English.

Экспериментальная работа ученых, достижения наших ученых, область науки, значение исследовательской работы, достижения науки, движение атомов, строение материи, свойства материалов, неплодородный, органическая структура, молекулы, состоящие из гигантских цепей, соединены последовательно, нитевидные, простые молекулы, живые клетки, соединяться в цепи, наследственность, структура хромосом, генетический код, самовоспроизводящийся.

Exercise 7. Write the sentences into plural.

1. This scientist works in the field of biology. 2. I don't know the structure of this substance. 3. An atom is a very, very small particle of matter. 4. That man has a good knowledge of medicine. 5. Polymeric compound is chemical substance composed of the same element in the same proportion but with different molecular weight. 6. But the structure of the chain in protein is much more complicated than in polythene. 7. Scientist has found way of joining the small molecule together into long chain thus forming a solid with various property of polythene or other plastic. 8. The mistake is known as genetic mutation and sometimes is very beneficial. 9. When the beneficial change occurs, evolution happens. 10. Every organism is in competition with other members of its species.

Exercise 8. Translate the explanation into Russian.

The DNA molecule consists of two polynucleotide chains in the form of a double helix, containing phosphate and the sugar deoxyribose and linked by hydrogen bonds between the complementary bases adenine and thymine or cytosine and guanine. DNA is self-replicating, plays a central role in protein synthesis, and is responsible for the transmission of hereditary characteristics from parents to offspring. Genetic code is the order in which the nitrogenous bases of DNA are arranged in the molecule, which determines the type and amount of protein synthesized in the cell.

The four bases are arranged in groups of three in a specific order, each group acting as a unit (codon), which specifies a particular amino acid.

Exercise 9. Translate the words and phrases into Russian and make up sentences with them.

Biotechnology, recombinant DNA techniques, restriction enzymes, viral genes, molecular biologists, transgenic organisms, antibiotic resistance, plasmid vectors, fearful restraint, DNA sequencing methods, oligonucleotide synthesis, transfection techniques, human genes, human hormones, bacteria models, biotech boom.

Exercise 10. Find in the passage above English equivalents to Russian ones.

Жизнь на земле развивалась из; но на этот раз получили белки; во время прошлых опытов получали только аминокислоты; готовый в дальнейшем претерпевать более сложные изменения; был бы немедленно проглочен или поглощен; что не случилось бы; примитивные условия; эволюционировать; формы жизни на земле; ставить эксперимент; точно воспроизводить определенные условия жизни; субстанция, содержащая начало жизни; покрываться пеной; сложные изменения; синтезировать жизнь; процесс наследственности; маленькие молекулы; длинные цепи; различный молекулярный вес; пропорция; эволюция Дарвина; составлять; химические вещества; жидкость; газообразный; формирование органических соединений; формирование живых клеток; строительные кирпичики живой материи.

Exercise 11. Read the text and title it.

Scientists prepare a substance which contains the beginning of life. Scientists have produced a brown soup which may be the sort of substance life on earth developed from. Methane gas and ammonia were mixed; the mixture was bombarded with an electric spark for 24 hours. In this way our primitive atmosphere with its thunder-storms was imitated. Hydrogen cyanide was produced and it turned into a black solid. Next, water was added to it, and the black solid became a brown scum.

The scum contained proteins. It is thought that a scum-like substance once covered the earth. Experiments like this had been made before. But this was the first time that proteins were produced, till then amino-acids had been obtained in all the previous experiments. Life must have come from simple, non-living forms millions of years ago. It must have started in the earth's primitive oceans, whose consistency was like thin soup. The big difficulty of synthesizing life lies in the fact that the primitive conditions could never be exactly reproduced.

Darwin said, "If we could conceive in some warm little pond with all sort of ammonia, phosphoric salts, light, heat, electricity, present, that a protein compound was chemically formed, ready to undergo still more complex changes, at the present day, such matter would be instantly devoured or absorbed which would not have been the case before living creatures were formed." Whether life can be made in laboratories in the next ten years remains to be seen. But such experiments show how the road to life started and, perhaps, how life forms started to evolve on our planet.

Exercise 12.. Translate the sentences into English paying attention to the possessive pronouns.

1. Я взяла свои материалы и начала проводить опыты. 2. Он проводил свои исследования в заводской лаборатории. 3. Большинство наших ученых работает на заводах, так как их работа очень важна для промышленности. 4. Мы много слышали об этом заводе и его лабораториях. 5. Заводская газета писала о них и об их экспериментах, а также об их достижениях в области биологии.6. Он поставил более 100 экспериментов в своей лаборатории. 7. Ученые создали в своих научных трудах теоретические условия для воспроизведения жизни. 8. Синтезировать жизненные процессы чрезвычайно сложно. 9. Проведенные эксперименты показали путь к рождению жизни на земле. 10. Ученые надеются, что в последующие 20 лет эта проблема будет решена.

Exercise 13.. Translate the words and word-combinations into Russian.

Substance; to contain; the beginning of life; to produce; life on earth; to develop; to be mixed; mixture; primitive atmosphere; to imitate; black solid.; to add; experiments; proteins; to obtain; non-living forms; primitive conditions; in the earth's primitive oceans; synthesizing life; to undergo; complex changes; living creatures.

IT'S NOT «ALL IN THE GENES»

The environment you grow up in is as important as your DNA in determining the person you ultimately become.

It is no surprise that virtually every list that appeared of the most influential people of the 20th century included James Watson and Francis Crick, right up there alongside Churchill, Gandhi and Einstein. In discerning the double-helical nature of DNA, Watson and Crick paved the way for understanding the molecular biology of the gene, the dominant scientific accomplishment of the postwar era. At the same time, it's not surprising that many people get nervous at the prospects of that scientific milestone. It will not doubt be a revolution, but there are some scary "Brave New World" overtones that raise fundamental questions about how we will think about ourselves.

Will it mean that our behaviors, thoughts and emotions are merely the sum of our genes, and scientists can use a genetic roadmap to calculate just what that sum is? Who are we then, and what will happen to our cherished senses of individuality and free will? Will knowing our genetic code mean we will know our irrevocable fates? I don't share that fear, and let me explain why.

At the crux of the anxiety is the notion of the Primacy of Genes. This is the idea that if you want to explain some big, complex problem in biology (like why some particular bird migrates south for the winter, or why a particular person becomes schizophrenic), the answer lies in understanding the building blocks that make up those phenomena – and that those building blocks are ultimately genes. In this deterministic view, the proteins unleashed by genes "cause" or "control" behavior.

Have the wrong version of a gene and you're guaranteed something awful, like being pathologically aggressive, or having schizophrenia. Everything is preordained from conception.

Yet hardly any genes actually work this way. Instead, genes and environment interact; nurture reinforces or retards nature. For example, research indicates that "having the gene for schizophrenia" means there is a 50 % risk you'll develop the disease, rather than absolute certainty.

The disease occurs only when you have a combination of schizophrenia-prone genes and schizophrenia-including experiences. A particular gene can have a different effect, depending on the environment. There is genetic vulnerability, but not inevitability. The Primacy of Genes also assumes that genes act on their own. How do they know when to turn on and off the synthesis of particular proteins? If you view genes as autonomous, the answer is that they just know.

However, that view is far from accurate too. Within the staggeringly long sequences of DNA, it turns out that only a tiny % age of letters actually form the words that constitute genes and serve as code for proteins. More than 95 % of DNA, instead, is "non-coding".

Much of DNA simply constitutes on and off switches for regulating the activity of genesWhat regulates those switches? In some instances, chemical messengers from other parts of the cell. In other cases, messengers from other cells in the body (the way many hormones work). And, critically, in still other cases, genes are turned on or off by environmental factors.

As a crude example, some carcinogens work by getting into cells, binding to one of those DNA switches and turning on genes that cause the uncontrolled growth that constitutes cancer.

Or a mother rat licking and grooming her infant will initiate a cascade of events that eventually turns on genes related to growth in that child. Or the smell of a female in heat will activate genes in certain male primates related to reproduction. Or a miserably stressful day of final exams will activate genes in a typical college student that will suppress the immune system, often leading to a cold or worse. You can't dissociate genes from the environment that turns genes on and off. And you can't dissociate the effects of genes from the environment in which proteins exert their effects.

The more science learns about genes, the more we will learn about the importance of the environment. That goes for real life, too: genes are essential but not the whole story.

Exercise 1. Read the text by Robert Sapolsky and give the essentials of its contents.

Exercise 2. Translate the words and phrases from the text and draw up sentences with them.

Фактически, различать, спиральный, достижение, веха, бесповоротный,суть, первенство, белок, выпускать, предопределять, воспитание, усиливать, замедлять, склонный (к чем-л.), вызывающий, уязвимость, неизбежность, самостоятельно, точный, поразительно, посыльный, грубый, карциногенное вещество, размножение, отделять, проявлять, необходимый, генетически измененный, имплантировать, чужой, вводить, резус, медуза, светиться, добиваться, имитировать, извлечение, тревога, не учитывать, испытание, цель, изымать, удалять, вводить, оплодотворять, развившийся, эмбрион, заменитель, плод, зародыш, уцелеть, мораль, обнаруживать, сложный, громоздкий, методика, этика, флюоресцирующий, мертворожденный.

Exercise 3. Fill in the blanks with «much», «many», «little», «few», & translate the sentences.

1. ... scientists study the structure of matter. 2. We haven't ... time for the experiments; we shall be able to make very ... of them. 3. There were ... theories on the nature of heat. 4. There is ... water in this cup.

Exercise 4. Read and translate the word-combinations.

To discuss reactions, to light a match, to agitate the molecules, to combine with oxygen, to be composed of atoms, to break, into fragments, to control the rate, to use catalysts, to increase the velocity. It is generally known, it is very important, it is greatly accelerated, it is easily combined, it is hardly probable, it is entirely stopped. The temperature is increased, the reaction is started, the match is lighted, the velocity is slowed down, the rate is controlled, the change is accelerated.

Exercise 5. Write the sentences in the past and future tenses and translate them into Russian.

1. The scientists must study the composition of this substance. 2. The students may use different methods of work. 3. They can show their achievements. 4. He may work at the laboratory of our institute.

Exercise 6. Explain the use of "some", "any", "no" in the sentences and translate them.

1. Some of the materials found in the crust of the earth are very important. 2. Some substances may exist as crystals of different forms depending upon the conditions under which they are produced. 3. No part of the earth is more necessary to life than our atmosphere. 4. Without an atmosphere there will be no clouds, no rains, no running water and no wind. 5. No two substances expand alike. 6. Forces acting on a body are in balance when they produce no change in the motion of the body. 7. Three forces cannot be in balance if the sum of any two is less than the third or if the difference between any two is greater than the third. 8. Not long ago iron and steel were the only materials used in the construction of any machine. 9. By adding 80 calories of heat, one gram of ice is converted into the liquid state. This addition of the 80 calories does not cause any change in temperature.

Exercise 7. Translate the sentences into Russian.

1. There are some books on biology in this bookcase. 2. There was a scientific conference not long ago. 3. There are some radioactive elements in our laboratory. 4. They have books in different fields of science in their library. 5. We must provide all the necessary materials for the experiment. 6. There is somebody in the laboratory. 7. This postgraduate has some books on the structure of matter. 8. We can see large molecules in an electron microscope. 9. Chemists discovered some important elements not long ago. 10. Molecules consist of atoms. 11. You can get into danger by experimenting in magic. 12. Many people disapprove of scientists who experiment on animals. 13. Scientists experiment with rats in order to discover facts about human behaviour. 14. You must carry out an experiment. 15. Molecular biology is the study of the structure and function of the complex chemicals that are found in living things. 16. Molecular biology is the branch of biology that deals with the structure and function of the macromolecules. 17. Biologism is the interpretation of human life from a strictly biological point of view.

Exercise 8. Read the information & pick up the essential details in the form of quick notes.

ANDI, FIRST GM PRIMATE. WILL HUMANS BE NEXT?

Scientists plant alien gene in monkey for first time. The prospect of genetically modified human beings moved a step closer with the announcement that scientists had for the first time implanted an alien gene in a monkey, a species closely related to man. ANDi – "inserted DNA" backwards – a rhesus monkey, carries a gene which makes jellyfish glow green in almost every one of his trillions of natural cells. If he has offspring, they will also carry the gene.

The US researchers who enabled ANDi's birth are not seeking to make GM people. They are trying to create transgenic monkeys which perfectly mimic human diseases, so that cures can be found. But rhesus monkeys and humans are so similar – they belong to the same order, the primates – that gene modification success in one is convincing evidence it would work in the other.

Even setting aside the distant prospect of GM people, alarm was already being voiced about a future increase in experiments on transgenic monkeys. In ANDI, the jellyfish gene was used as a trial run. "Experimentation on primates is particularly problematic because they are closer to us, because we know they are much more likely to suffer in similar ways to us", said Sue Mayer, of Gene Watch UK. Last year the Oregon centre successfully cloned a monkey for the first time.

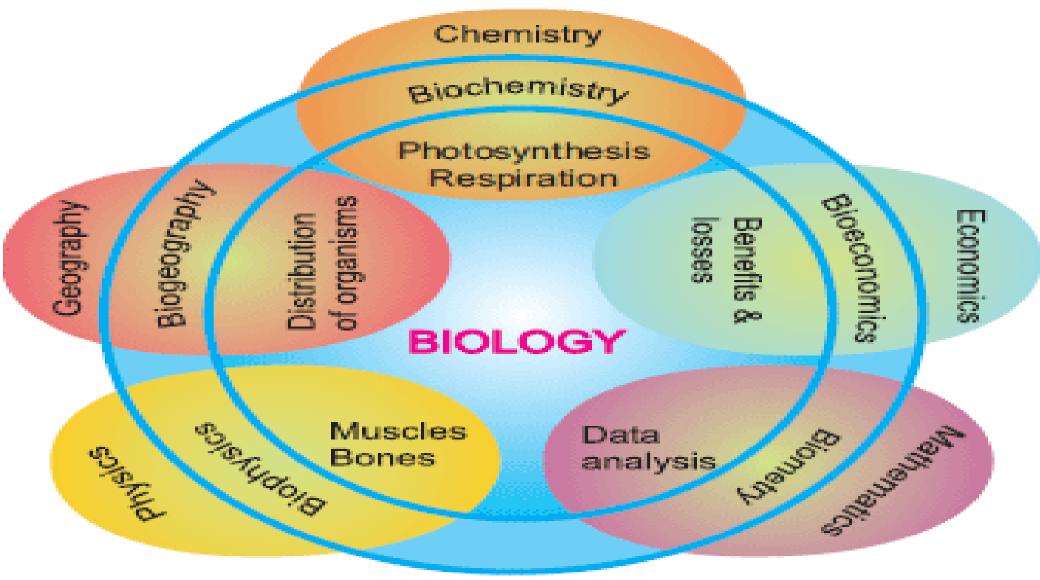
The birth of ANDi leaves researchers a long way from their goal: to take a primate egg, suppress or remove an inherited gene and insert another gene in exactly the right place.

To create ANDi – who will probably now be patented – the Oregon team took 224 monkey eggs and used a modified virus to carry the jellyfish gene inside each one.

The gene was then written into one of the monkey's chromosomes. A few hours later, the eggs were fertilized with monkey sperm. A little over half developed into full-fledged embryos, and scientists implanted 40 of these in 20 surrogate monkey mothers. Only three monkey foetuses survived to be born, and the jellyfish gene was detected in only one, christened ANDi. Even in ANDi, the gene does not seem to be producing the chemical it should, since the monkey's hair roots and toenails do not glow under fluorescent light. Two monkeys which were stillborn did glow, however.

"Efforts to make a fluorescent green monkey are not quite a glowing success – yet", commented Science magazine." The cumbersome technique is not likely to lead to transgenic humans, green or otherwise." Yet scientists point out that ANDi does represent the first evidence that primate eggs can develop normally after genetic manipulation.

"Ethics considerations aside, the project might have been easier to achieve in humans, for whom IVF technology is much more advanced", the journal wrote. ANDi offers hope to scientists trying to mimic human diseases, so that ways can be found to cure them copyright: science.



MEMORY & PROTEIN SYNTHESIS

What is the mechanism of memory? The question has not yet been answered, but the kind of evidence needed to answer it has slowly been accumulating. One important fact that has emerged is that there are two types of memory: short-term and long-term.

To put it another way, the process of learning is different from the process of memory-storage; what is learned must somehow be fixed or consolidated before it can be remembered.

People who have received shock treatment in the course of psychiatric care report that they cannot remember experiences they had immediately before the treatment. It is as though the shock treatment had disrupted the process of consolidating their memory of the experiences.

In our laboratory at the University of Michigan we have demonstrated that there is a connection between the consolidation of memory and the manufacture of protein in the brain. Our experimental animal is the common goldfish (Carassius auratus).

Basically what we do is train a large number of goldfish to perform a simple task and at various times before, during and after the training inject into their skulls a substance that interferes with the synthesis of protein. Then we observe the effect of the injections on the goldfish's performance.

Why seek a connection between memory and protein synthesis? For one thing, enzymes are proteins, and enzymes catalyze all the chemical reactions of life. It would seem reasonable to expect that memory, like all other life processes, is dependent on enzyme-catalyzed reactions.

What is perhaps more to the point, the manufacture of new enzymes is characteristic of long-term changes in living organisms, such as growth and the differentiation of cells in the embryo.

Long-term memory is by definition a long-term change. A molecule of protein is made from 20 different kinds of amino acid molecule, strung together in a polypeptide chain. With this knowledge of protein synthesis one can begin to think of examining the process by interfering with it in selective ways. Such interference can be accomplished with antibiotics. As an example, the antibiotic puromycin simply stops the growth of the polypeptide chain in the ribosome.

Exercise 1. Translate the sentences into Russian.

I. An experiment will show that in air molecules occupy only a small portion of the space. 2. The liquid is not the only possible state in which water can exist. 3. The gas molecules do have attraction for one another although the attraction is very small. 4. We live at the bottom of an ocean of air and usually we do not notice its pressure. 5. Solids do not flow as liquids do, and they do not expand and occupy place as gases do. 6. The electrical power does much useful work today. 7. Since there is so much water, some people think that it is of little value or interest. 8. We still use alcohol in modern thermometers, since its expansion is greater than the expansion of mercury. 9. Since ancient times people studied nature and natural phenomena. 10. The molecules of gas move rapidly and continually. When we heat the gas the motion of the molecules becomes still more rapid. 11. Air, like the ocean, is never still but always full of waves.

Exercise 2. Read the text and answer the question: How do freckles form?

In spring and summer when the sun shines most of the day a large number of people have freckles. They are caused by the sunshine. It stirs a brownish pigment which normally lies in the deep layers of the skin and the pigment comes to the surface where it can be seen. The skin is not just a thin jacket to cover the body. It is a complex organ with many functions. It has oil glands and sweat glands and very small roots from which hairs grow. It has blood vessels and nerves. Its thickness may be from one-sixth to one-fiftieth of an inch. The outer layer of the skin, called the epidermis, is a thin tissue of cells constantly coming off. The cells grow in the lower layer called the dermis.

In the dermis there is a brown pigment. The sunshine brings a spot of the pigment from the dermis to the epidermis where it can be seen as a freckle. Freckles disappear when old cells of the epidermis come off, and new cells which have grown in the dermis take their place.

Exercise 3. State the function of the Participle and translate the sentences into Russian.

1. Power is the ratio of an amount of work performed divided by the time taken by the performance. 2. A given volume of space is able to hold any number of different gases at the same time. 3. It is known that the atom in the main consists of three particles: the proton and the neutron forming the nucleus with a positive charge and the electrons having a negative charge. The anti-electron, called positron, was discovered in 1932. 4. The stars cannot be seen in the daytime because of the brightness of the sun. 5. The attraction between molecules of a liquid is much less than it is in solids, permitting them to move far away from one another. 6. It is possible to mention thousands of physical and chemical changes taking place in nature.

Exercise 4. Read the text on pasteurization and render its contents shortly in English.

Louis Pasteur was trained as a chemist and by the time he was twenty-six he had already become one of the greatest chemists of his day. But he did not restrict his activities to chemistry. Here are some facts illustrating the wide range of his activities. Up to 100 years ago it was believed that life was generated spontaneously. It was thought that worms were generated from mud, maggots – from bad meat. Even a drop of clean water was soon found full of microbes. Louis Pasteur proved that those ideas were wrong. If germs had no access to a substance, no life was generated there. Pasteur was the first to show that fermentation, the conversion of sugar to alcohol or other products, is caused by small plants which are too small to see except under a microscope.

Wine, for example, is produced by fermentation of sugar in grape juice to alcohol.

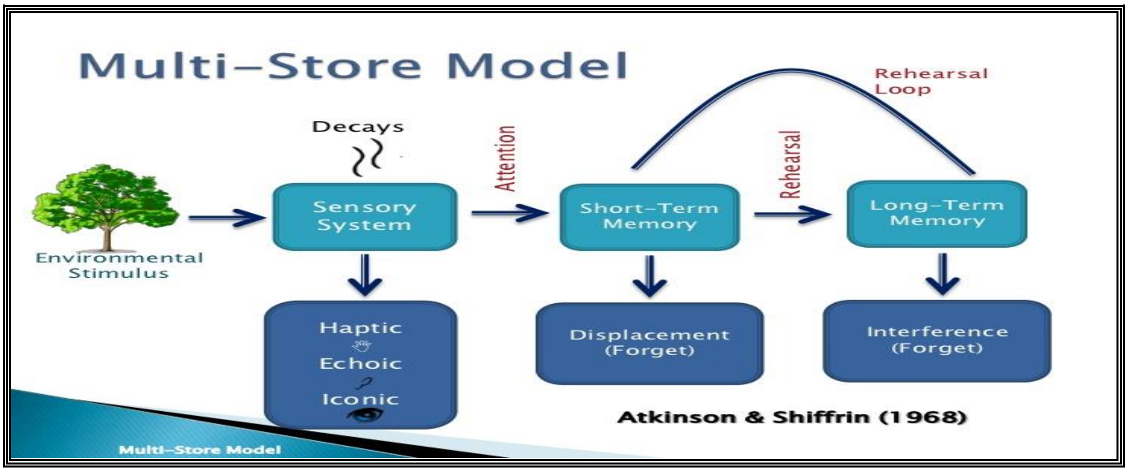
This conversion of sugar to alcohol is brought about by yeast. He also showed that the process of fermentation could be spoiled by the presence of other microorganisms, and wine could turn into vinegar. Pasteur destroyed the microorganisms by heating the wine and that gave the language a new word – pasteurization. Louis Pasteur invented a method of curing a disease by inoculating the patient with the weakened virus of the disease itself. In his last work he discovered a cure for the fatal disease known as rabies.

Exercise 5. Translate the explanation into Russian and comment on it.

If we are interested in the heat relations of the human animal, for example, his clothing and housing and his work habits become environmental effects. Cultural influences are so pervasive that the study of human biology, or man's uncultured physiology, is made very difficult.

Exercise 6. Explain the use of tense-forms in the sentences into Russian.

1. When the students come to the plant they will be taken to the plant laboratory and will be shown modern apparatus and devices. 2. If you pour water into sulphuric acid, heat will be given off, an explosion will take place. 3. If we heat the solution, the reaction will take place at a higher rate. 4. If we cool the solution, the reaction will slow down. 5. If they finish their experiments, they will tabulate the data.



GERM WARFARE

They are all around, all the time, causing complaints such as food poisoning, skin infections and colds. So how do we keep the bugs at bay? Scientists are not as enamoured with antibacterial products as the general public. Most germ experts believe that diligent handwashing is the most effective way to fight germs and that any soap will do. Any soap, antibacterial or not, helps eliminate germs by suspending them in water so they can be washed away. Careful washing will eliminate harmful bacteria we're most likely to come in contact with, like staphylococcus, streptococcus, E-coli, and salmonella, which cause skin infections, sore throat and food poisoning, respectively. Many people don't realise that antibacterial soaps only work on a clean surface.

Organic matter, like food, deactivates a disinfectant. There is a danger that consumers might be lulled into a false sense of complacency by thinking that these products serve as a substitute to traditional clearning. There is the possibility that routine use of antibacterial spray could encourage the build-up of more resistant bacteria. If you destroy the natural bacterial population, you reduce competition for incoming pathogens and enable them to gain a foothold. Scientists point out that trying to eradicate all bacteria from your environment is unnecessary and possibly harmful.

We have a nice coexistence with a lot of germs. Your gastrointestinal tract has germs most of which do no harm and some of which are beneficial. They help with digestion and produce B-complex vitamins. Your skin also contains bacteria that colonise to protect you from pathogenic bugs.

Still, anyone who has suffered a painful bout of food poisoning or the misery of a winter cold knows that there are plenty of pathogens out there. In fact germ experts frequently mention the kitchen as the most likely place where people develop illness from bacteria. We have to assume that meat products are contaminated with pathogenic organisms like E-coli and salmonella, so it's essential to practice stringent avoidance of cross contamination. Cross contamination can be avoided by washing hands immediately before and after touching raw meat, using separate work surfaces for cooked and raw foods and cleaning work areas thoroughly with soap and water.

Away from food, the germs that cause us greatest risk are not bacteria but the viruses of the common cold. Like most viruses, a cold's route of transmission is most likely hand to mouth.

If someone sneezes into their hand, which you then shake and then touch your eyes, nose or mouth, the virus may well set up house in your body. Although it is possible to pick up cold germs from inanimate surfaces, viruses need moisture to survive. As long as moisture is present, viruses may be viable. But under dry conditions they die pretty quickly. But even though bacteria like E-coli and streptococci can last for weeks on a doorknob, it doesn't mean we'll get sick from touching the surface.

A number of conditions have to exist, including a high number of living germs and a means of getting them into the body. Actually, the areas we perceive as germ-riddled, like public lavatories, door handles and public telephones, pose less of a hazard than we might think.

Exercise 1. Digest the score of the information briefly in English.

Exercise 2. Translate the sentences into Russian with the help of the text.

Микроб; война, борьба; вирус; не подпускать; тщательно; шаг в сторону; (мед.) невроз страха, фобия; увлеченный; уничтожать; удерживать; потребитель; дезинфицирующее средство; внушить; благодушие; конкуренция; возбудитель заболевания; укрепиться; уничтожать; кишечный; полезный; пищеварение; приступ; заражение; строгий; поселиться; неживой, неодушевленный; влага; жизнеспособный; покрытый микробами; создавать риск.

Exercise 3. Translate the explanation into Russian and comment on it.

If we are interested in the heat relations of the human animal, for example, his clothing and housing and his work habits become environmental effects. Cultural influences are so pervasive that the study of human biology, or man's uncultured physiology, is made very difficult.

Exercise 4. Translate the sentences into Russian with the help of the information above.

Слюна; глотать; таиться; неповрежденный; пристрастие; ребенок, начинающий ходить; обуять (о страхе); не без основания; слюнявить; сосать; кукла, чучело; полоскать; ткань.

Exercise 5. Check out the risk from the following.

Telephones

"Even if someone with a cold leaves spit on the mouthpiece, the next user would have to ingest the spit to become infected", says Peter Hoffman, scientist at the Central Public Health Laboratory. "Germs will lurk a few millimetres away, but won't transfer back."

Public toilets

"It's not that likely that you'll pick something up in a public lavatory because what comes in contact with contaminated surfaces is probably intact skin, which is a supremely good barrier", says Hoffman.

Getting germs into your mouth is a far more likely route for infection, he says, which is why it's important to wash your hands.

Flies on food

"You can never be sure where a fly has been before it lands on your food", says Hoffman.

"Flies have a predilection for things with lots of bugs on them and although it depends on what they've been on immediately before, the transfer of germs is fairly immediate."

Toys that fall on the floor

Mothers of toddlers also tend to be germ obsessed and with good reason. Bables steady rate of drooling and sucking creates enough moisture to keep viruses happy. Children are most likely to get sick from each other rather than from sucking toys that have dropped on the floor. "It's not all that likely that a baby will pick up a disease from a dummy that's fallen on the floor", says Charles Penn at the University of Birmingham. "The danger times would be if an animal had just walked across the carpet or if it happened in the kitchen where raw meat was being prepared."

The best defence against germs is proper hand washing. Here's how:

Scrub with soap for at least 10 seconds to loosen germs.

Rinse long enough to wash germs away.

Rub fingernails well – germs hide underneath.

Dry hands with clean, dry towels.

Change towels frequently. Germs lurk in wet cloths.

Exercise 6. Complete the sentences with the facts from the text below.

1. If you study his respiration, digestion, reproduction, muscle contraction, nerve or endocrine coordination, you ____. 2. Men, monkeys, and apes are very similar in the details of ____. 3. The human difference is most easily labelled with ____. 4. Every man has two inheritances ____. 5. The physicochemical sciences are concerned with ____. 6. The various groups of sciences must each use rather different methods and delve into ____. 7. Psychology and anthropology are the social sciences most clearly related to ____. 8. Experimental psychology always includes much biological ____. 9. Comparative psychology deals with ____. 10. Physical anthropology is also largely a biological science, and covers _____. 11. Physical anthropology is that part of the science concerned with ____. 12. The relationship between the biological and social sciences begins with ____. 13. Nutrition and reproduction are universal biological ____. 14. The concept of evolution teaches us ____. 15. Life started as a development from _____.

Exercise 7. Translate the sentences into Russian, playing attention to the words in bold type.

1. There exist, **at least**, two modifications of sulphur. 2. This mixture consists of **at least** three constituents. 3. Nitrogen and oxygen are **both** necessary for breathing. 4. Hydrogen peroxide acts **both** as an oxidizing and as reducing agent. 5. According to the law of conservation of matter, it can **neither** be created **nor** destroyed.

THE HUMAN ANIMAL

Man is clearly an animal. If you cut a specimen open, you find that the parts – heart, intestines, liver, lungs – differ little from the corresponding organs of dogs, cats, or monkeys.

If you study his respiration, digestion, reproduction, muscle contraction, nerve or endocrine coordination, you find the same general processes and the same general chemical and physical relations that you find in other animals. If you are interested in classification, you have no difficulty in recognizing that man is a vertebrate and hence belongs to the phylum Chordata.

Among the vertebrates, he obviously belongs with the class of mammals. Although he has an unusually small amount of hair, other mammals have even less – whales, for instance. He is bipedal, using only his hind legs for locomotion, but this is true also of kangaroos.

Men, monkeys, and apes are very similar in the details of their anatomy, and among the mammals it is customary to group them together as an order, the primates. Yet, equally unquestionably, man is very peculiar, so different from everything else that you can plausibly argue that he is not really an animal at all but a quite new sort of phenomenon in the world.

This difference, when analysed, turns not on anatomy and physiology, but on behavior and accomplishment. The difference is clear, but its cause or basis, the way in which it developed, and its essential nature, are not easily described or analysed. The human difference is most easily labelled with the anthropological word "culture".

By culture is meant the way of life, the accumulated tradition, knowledge, and customs of a people, transmitted from generation to generation and from individual to individual by teaching and learning. Every man has two inheritances: the biological, genetic inheritance of his animal nature, and the cultural inheritance which depends largely on language, on symbol systems.

Human behavior is so complex that it has become the subject of several distinct sciences, which are grouped together as the "social sciences". In general we can distinguish among the physicochemical, biological, and social sciences.

The physicochemical sciences are concerned with the inanimate forces and materials of the universe; the biological sciences with the special properties of life; the social sciences with the special properties of culture. Perhaps some day the social and cultural behavior of man will be explicable in biological terms – and ultimately again in physicochemical terms.

But we are a long way from any such eventuality now, and these various groups of sciences must each use rather different methods and delve into different kinds of problems. A real unity does exist in science, however; there is a continuity between physical and biological sciences, on the one hand, and biological and social sciences on the other. Biochemistry and biophysics provide convenient labels for the one continuity; the other, no less important, is not so obviously labelled.

Psychology and anthropology are the social sciences most clearly related to biology.

Both, in fact, include large areas of knowledge that could be regarded as purely biological. Comparative psychology deals with the behavior of animals – or may even be extended to include plant behavior. Experimental psychology always includes much biological material, even when the experiments involve human subjects and are aimed at solving human problems.

Physical anthropology is also largely a biological science, and covers genetics, human physical types, and racial diversity, and fossils of men or man-like animals.

Physical anthropology, therefore, is that part of the science concerned with man as an animal – the other parts of anthropology concentrate more on man as a bearer of culture.

The relationship between the biological and social sciences begins with the problem of the biological roots of cultural phenomena. We are here concerned with the differences between man as an animal and man as a bearer of culture. One extreme view holds that human behavior is culturally determined and that man's animal background is irrelevant and meaningless.

The other extreme considers that since man so obviously is an animal, everything about him must have a biological explanation. The truth probably lies somewhere in between.

Man has retained his animal constitution which forms, however distantly, a background for his actions; but his actions are more than those of just an animal.

Nutrition and reproduction, for instance, are universal biological drives found in all organisms. Yet food behavior and sexual behavior in man cannot be understood in purely biological terms.

What one eats, when one eats, how one eats, whom one eats will vary greatly from culture to culture and are clearly learned patterns of behavior. Hunger, however, still has a physiological basis; digestion is still a chemical process, even though this does not explain why, among some peoples, ants are highly prized food while, among others, the idea of eating ants is horrifying.

The hunger drive may be thwarted by fasting, for cultural reasons, and sometimes men will die rather than eat food they believe unfit. The concept of evolution teaches us that the cultural grew out of the biological just as, at another level, the living grew out of the inorganic. Life started, somehow, as a development from inorganic processes; and culture started, somehow, from biological origins.

But once culture started, once man started transmitting learned behavior from generation to generation, human behavior began to take on special aspects. Every man is the consequence of his two inheritances. We can call one somatic and the other extrasomatic.

The somatic inheritance is biological and depends on genes and chromosomes; the extrasomatic is cultural and depends on symbolic forms of communication. We can find all sorts of analogies between the two systems. The symbol systems on which tradition depends compare with the genetic systems on which biological inheritance depends. Cultural traits are adaptive, in many ways, as are biological traits, and the various kinds of adaptations can be studied.

The diffusion of cultural traits can be traced and we see Wending or hybridization – and conflict – in cultures. But it is dangerous to forget that we are dealing with two very different systems.

That the two often show analogies does not mean that they are the same thing. We can learn much about each of the systems, however, by studying the analogies – if we are careful – and it is unfortunate that the two systems are generally studied by quite different people, working in different scientific worlds. If we look at the man and culture relationship from the point of few of organism and environment, we are confronted with this question: Is culture an attribute of the human organism, or is it part of the human environment? The ways of answering this can serve as a somewhat oversimplified distinction between the psychological and anthropological views of man.

Psychologists tend to consider culture as a part of the environment: they concentrate on the reactions of the individual to his culture, how he copes with it or fails, how he becomes adjusted or frustrated. For the biologist, culture must at times be viewed as part of the man, at other times as part of the environment.

We must always be aware that we are dealing with the man-culture-environment complex. When we study man's ecological relationships, it is generally man and culture versus the environment that interests us. The ecological character of a man in the Congo, for instance, depends on whether he is a food-gathering pygmy, an agricultural Bantu, or an industrialized Belgian.

On the other hand, when we study man's physiology, it is more useful to treat culture as a part of the environment.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Translate the words and phrases into Russian.

Ferment; fermentation; acetic fermentation; alcoholic fermentation; bacterial fermentation; fermentation activity; fermentation room; fermentation vat; lactic acid fermentation; active fermentation; bacterial fermentation; spontaneous fermentation; the intellectual fermentation of Germany.

Exercise 3. Read the information & pick up the essential details in the form of quick notes.

Exercise 4. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 5. State the function of the Present Participle and translate the sentences into Russian.

1. A substance resisting all ordinary or chemical efforts to decompose it into simpler substances is an element. 2. Being a good conductor, copper is often used in industry. 3. Having a high melting point tungsten is widely used for the production of electric lamps. 4. The changes affecting the composition of materials are chemical changes. 5. Adding heat we can change the state of a substance. 6. A molecule is a compound consisting of two or more atoms. 7. Heating a substance we cause a more rapid motion of its molecules.

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UNIT II. VIRUSES IN OUR LIFE

INTRODUCTION

A **virus** is a biological agent that reproduces inside the cells of living hosts. When infected by a virus, a host cell is forced to produce many thousands of identical copies of the original virus, at an extraordinary rate. Unlike most living things, viruses do not have cells that divide; new viruses are assembled in the infected host cell. Over 2,000 species of viruses have been discovered.

A virus consists of two or three parts: all viruses have genes made from either DNA or RNA, long molecules that carry the genetic information; all have a protein coat that protects these genes; and some have an envelope of fat that surrounds them when they are not within a cell.

Viruses vary in shape from the simple helical and icosahedral to more complex structures. Viruses are about 100 times smaller than bacteria, and it would take 30,000 to 750,000 of them, side by side, to stretch to 1 centimetre (0.39 in).

Viruses spread in many different ways. Plant viruses are often spread from plant to plant by insects and other organisms, known as *vectors*. Some viruses of animals are spread by blood-sucking insects. Each species of virus relies on a particular method. Whereas viruses such as influenza are spread through the air by people when they cough or sneeze, others such as norovirus, which are transmitted by the faecal-oral route, contaminate hands, food and water. Rotavirus is often spread by direct contact with infected children. HIV is one of several major viruses that are transmitted during sex. The origins of viruses is unclear: some may have evolved from plasmids – pieces of DNA that can move between cells – while others may have evolved from bacteria.

Viral infections often cause disease in humans and animals, however they are usually eliminated by the immune system, conferring lifetime immunity to the host for that virus. Antibiotics have no effect on viruses, but antiviral drugs have been developed to treat life-threatening infections. Vaccines that produce lifelong immunity can prevent some viral infections.

Exercise 1. Describe the stages of origin.

Viruses are found wherever there is life and have probably existed since living cells first evolved. The origin of viruses is unclear because they do not form fossils, so molecular techniques have been the most useful means of hypothesising how they arose. However, these techniques rely on the availability of ancient viral DNA or RNA but most of the viruses that have been preserved and stored in laboratories are less than 90 years old. Molecular methods have only been successful in tracing the ancestry of viruses that evolved in the 20th century. There are three main theories of the origins of viruses:

- **Regressive theory**: Viruses may have once been small cells that parasitised larger cells. Over time, genes not required by their parasitism were lost. The bacteria rickettsia and chlamydia are living cells that, like viruses, can reproduce only inside host cells. They lend credence to this theory, as their dependence on parasitism is likely to have caused the loss of genes that enabled them to survive outside a cell.

- **Cellular origin theory**: Some viruses may have evolved from bits of DNA or RNA that "escaped" from the genes of a larger organism. The escaped DNA could have come from plasmids – pieces of DNA that can move between cells – while others may have evolved from bacteria.

- **Coevolution theory**: Viruses may have evolved from complex molecules of protein and DNA at the same time as cells first appeared on earth and would have been dependent on cellular life for many millions of years.

Exercise 2. Translate the words and phrases into Russian drawing up sentences with them.

Virus, attenuated virus, filterable (ultra-microscopic) virus, influenza virus, slow virus, intestinal (enteric virus) virus, virus warfare, circulative virus, computer virus, indigenous virus, persistent virus, plant-pathogenic virus, propagative virus, rod-shaped virus, satellite virus, adapted virus, bacterial virus, AIDS virus, air-borne virus, causal virus, herpes simplex virus, immunodeficiency virus, masked virus, oncogenic (tumor) virus, virus carrier, virus core component, virus disease, virus inactivating agent, virus infection, virus prevention, virus protection, virus remover, virus scanner.

Exercise 3. Digest the score of the information briefly in English.

Exercise 4. Read the passage on discovery and translate it.

In 1884, the French microbiologist Charles Chamberland invented a filter, (known today as the Chamberland filter or Chamberland-Pasteur filter), that has pores smaller than bacteria.

Thus, he could pass a solution containing bacteria through the filter and completely remove them from the solution. Russian biologist Dimitri Ivanovski used this filter to study what is now known to be the tobacco mosaic virus. His experiments showed that the crushed leaf extracts of infected tobacco plants are still infectious after filtration. At the same time several other scientists proved that, although these agents (later called *viruses*) were different from bacteria, they could still cause disease, and they were about a hundred times smaller than bacteria.

In 1899 The Dutch microbiologist Martinus Beijerinck observed that the agent multiplied only in dividing cells. Having failed to demonstrate its particulate nature he called it a "contagium vivum fluidum" to mean "soluble living germ".

In the early 20th century, English bacteriologist Frederick Twort discovered viruses that infect bacteria, and French-Canadian microbiologist Félix d'Herelle described viruses that, when added to bacteria growing on agar, would lead to the formation of whole areas of dead bacteria. Counting these dead areas allowed him to calculate the number of viruses in the suspension.

With the invention of electron microscopy in 1931 by the German engineers Ernst Ruska and Max Knoll came the first images of viruses. In 1935 American biochemist and virologist Wendell Meredith Stanley examined the tobacco mosaic virus and found it to be mostly made from protein.

A short time later, this virus was separated into protein and RNA parts. A problem for early scientists was that they did not know how to grow viruses without using live animals.

The breakthrough came in 1931, when the American pathologist Ernest William Goodpasture grew influenza and several other viruses in fertilised chickens' eggs. Some viruses could not be grown in chickens' eggs, but this problem was solved in 1949 when John Franklin Enders, Thomas Huckle Weller and Frederick Chapman Robbins grew polio virus in cultures of living animal cells. Over 2,000 species of virus have been discovered.

Exercise 5. Define the structure of a virus.

A virus particle, known as a virion, consists of genes made from DNA or RNA which are surrounded by a protective coat of protein called a capsid. The capsid is made of many smaller, identical protein molecules which are called capsomers.

The arrangement of the capsomers can either be icosahedral (20-sided), helical or more complex. There is an inner shell around the DNA or RNA called the nucleocapsid, which is formed by proteins. Some viruses are surrounded by a bubble of lipid (fat) called an envelope. Viruses are among the smallest infectious agents, and most of them can only be seen by electron microscopy.

Their sizes range from 20 to 300 nm. They are so small that it would take 30,000 to 750,000 of them, side by side, to stretch to one cm.

Exercise 6. Make up some dialogues from the information above.

Exercise 7. Render the main idea of the information.

Exercise 8. Read the information & pick up the essential details in the form of quick notes.

Exercise 9. Render the score of genes.

Genes are made from DNA (deoxyribonucleic acid) and, in many viruses, RNA (ribonucleic acid). The biological information contained in an organism is encoded in its DNA or RNA. Most organisms use DNA, but many viruses have RNA as their genetic material.

The DNA or RNA of viruses consists of either a single strand or a double helix. Viruses reproduce rapidly because they have only a few genes compared to humans who have 20,000-25,000. For example, influenza virus has only eight genes and rotavirus has eleven.

These genes encode structural proteins that form the virus particle, or non-structural proteins, that are only found in cells infected by the virus. All cells, and many viruses, produce proteins. A virus's polymerase enzymes are often much more efficient at making DNA and RNA than the host cell's.

However, RNA polymerase enzymes often make mistakes, and this is one of the reasons why RNA viruses often mutate to form new strains. In some species of RNA virus, the genes are not on a continuous molecule of RNA, but are separated. The influenza virus, for example, has eight separate genes made of RNA. When two different strains of influenza virus infect the same cell, these genes can mix and produce new strains of the virus in a process called reassortment.

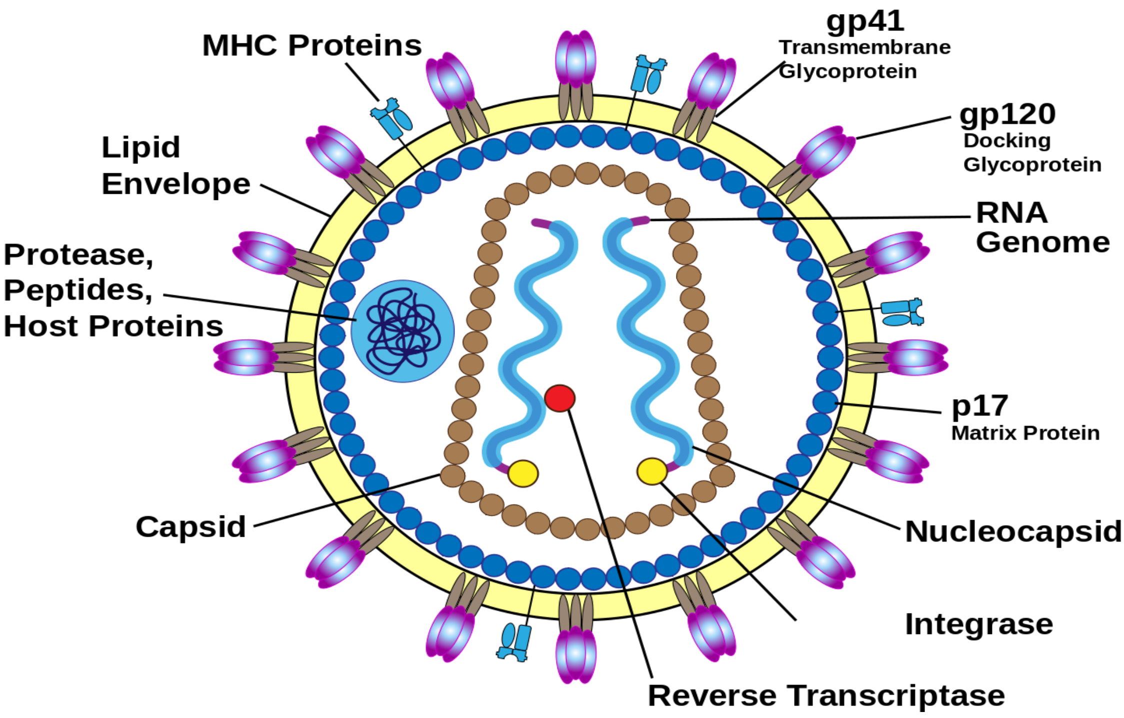
Exercise 10. Render the effects on the host cell.

The range of structural and biochemical effects that viruses have on the host cell is extensive.

These are called *cytopathic effects*. Most virus infections eventually result in the death of the host cell. The causes of death include cell lysis (bursting), alterations to the cell's surface membrane and apoptosis (cell "suicide"). Often cell death is caused by cessation of its normal activity due to proteins produced by the virus, not all of which are components of the virus particle.

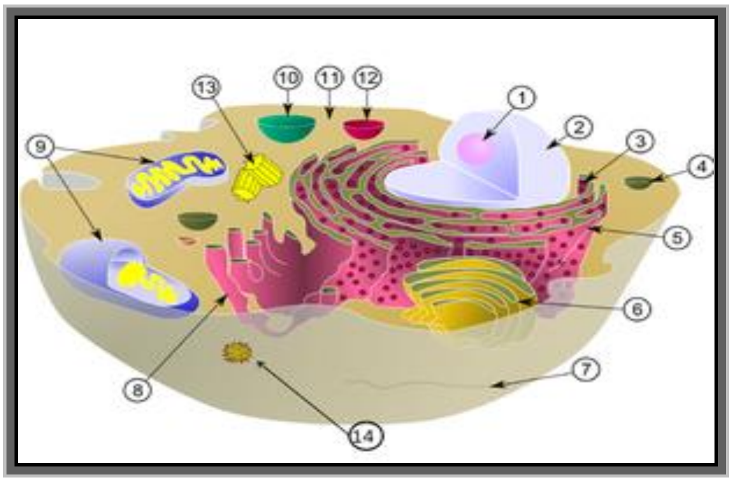
Some viruses cause no apparent changes to the infected cell. Cells in which the virus is latent and inactive show few signs of infection and often function normally. This causes persistent infections and the virus is often dormant for many months or years. This is often the case with herpes viruses.

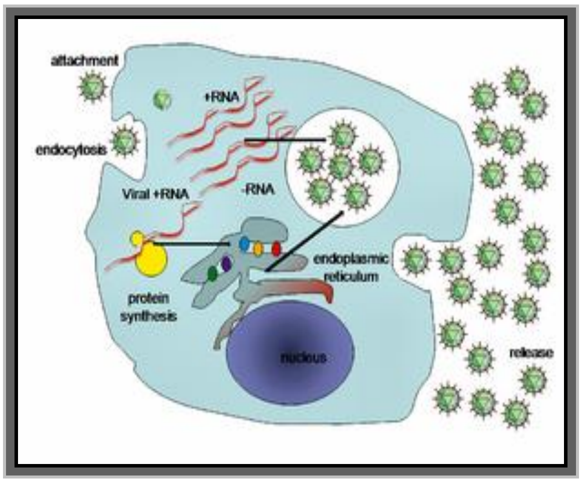
Viruses, such as Epstein-Barr virus often cause cells to proliferate without causing malignancy, but viruses, such as papillomaviruses are an established cause of cancer. When a cell's DNA is damaged by a virus and if the cell cannot repair this often triggers apoptosis. One of the results of apoptosis is destruction of the damaged DNA by the cell itself. Some viruses have mechanisms to limit apoptosis so that the host cell does not die before progeny viruses have been produced. HIV, for example, does this.



Exercise 11. Describe protein synthesis and life-cycle.

I. II.





I. Diagram of a typical eukaryotic cell, showing subcellular

II. Life-cycle of a typical virus

Diagram of a typical eukaryotic cell, showing subcellular components. Organelles: (1) nucleolus (2) nucleus (3) ribosome (4) vesicle (5) rough endoplasmic reticulum (ER) (6) Golgi apparatus (7) Cytoskeleton (8) smooth ER (9) mitochondria (10) vacuole (11) cytoplasm (12) lysosome (13) centrioles within centrosome (14) virus particle shown to approximate scaleProteins are essential to life. Cells produce new protein molecules from amino acid building blocks based on information coded in DNA. Each type of protein is a specialist that only performs one function, so if a cell needs to do something new, it must make a new protein. Viruses force the cell to make new proteins that the cell does not need, but are needed for the virus to reproduce. Protein synthesis basically consists of two major steps: transcription and translation.

Transcription is the process where information in DNA, called the genetic code, is used to produce RNA copies called messenger RNA (mRNA). These migrate through the cell and carry the code to ribosomes where it is used to make proteins. This is called translation because the protein's amino acid structure is determined by the mRNA's code.

Some RNA genes of viruses function directly as mRNA without further modification. For this reason, these viruses are called positive-sense RNA viruses. In other RNA viruses, the RNA is a complementary copy of mRNA and these viruses rely on the cell's or their own enzyme to make mRNA. These are called negative-sense RNA viruses. In viruses made from DNA, the method of mRNA production is similar to that of the cell. The species of viruses called retroviruses behave completely differently: they have RNA, but inside the host cell a DNA copy of their RNA is made. This DNA is then incorporated into the host's, and copied into mRNA by the cell's normal pathways.

Life-cycle of a typical virus, following infection of a cell by a single virus, hundreds of offspring are released. When a virus infects a cell, the virus forces it to make thousands more viruses. It does this by making the cell copy the virus's DNA or RNA, making viral proteins, which all assemble to form new virus particles.

Exercise 12. Translate the words and phrases into Russian drawing up sentences with them.

Effect, of (to, without) no effect, to have (produce) an effect, cause and effect, law of effect, adverse effect, beneficial (salutary) effect, calculated effect, deleterious (harmful) effect, desired effect, dramatic effect, hypnotic effect, limited effect, marginal effect, minimal effect, to negate (nullify) the effect, to feel an effect, effects, to be in effect, to come (go) into effect, to give effect to smth., in effect, to to take effect, with effect from..., useful effect, to do for effect, to this effect, general effect.

Exercise 12. Define basic stages in the life cycle of viruses.

There are **six basic, overlapping stages** in the life cycle of viruses in living cells:

- **Attachment** is the binding of the virus to specific molecules on the surface of the cell. This specificity restricts the virus to a very limited type of cell. Plant viruses can only attach to plant cells and cannot infect animals. This mechanism has evolved to favour those viruses that only infect cells in which they are capable of reproducing.
- **Penetration** follows attachment; viruses penetrate the host cell by endocytosis or fusion with the cell.
- **Uncoating** happens inside the cell when the viral capsid is removed and destroyed by viral enzymes or host enzymes, thereby exposing the viral nucleic acid.
- **Replication** of virus particles is the stage where a cell uses viral messenger RNA in its protein synthesis systems to produce viral proteins. The RNA or DNA synthesis abilities of the cell produce the virus's DNA or RNA.
- **Assembly** takes place in the cell when the newly created viral proteins and nucleic acid combine to form hundreds of new virus particles.
- **Release** occurs when the new viruses escape or are released from the cell. Most viruses achieve this by making the cells burst, a process called lysis. Other viruses such as HIV are released more gently by a process called budding.

Exercise 13. Give the relashionship between viruses and diseases.

Common human diseases caused by viruses include the common cold, the flu, chickenpox and cold sores. Serious diseases such as Ebola and AIDS are also caused by viruses. Many viruses cause little or no disease and are said to be "benign". The more harmful viruses are described as virulent.

Viruses cause different diseases depending on the types of cell that they infect. Some viruses can cause life-long or chronic infections where the viruses continue to reproduce in the body despite the host's defence mechanisms. This is common in hepatitis B virus and hepatitis C virus infections.

People chronically infected with a virus are known as carriers. They serve as important reservoirs of the virus. If there is a high proportion of carriers in a given population, a disease is said to be endemic.

There are many ways in which viruses spread from host to host but each species of virus uses only one or two. Many viruses that infect plants are carried by organisms; such organisms are called vectors. Some viruses that infect animals and humans are also spread by vectors, usually blood-sucking insects. However, direct animal-to-animal, person-to-person or animal-to-person transmission is more common. Some virus infections, (norovirus and rotavirus), are spread by contaminated food and water, hands and communal objects and by intimate contact with another infected person, while others are airborne (influenza virus).

Viruses such as HIV, hepatitis B and hepatitis C are often transmitted by unprotected sex or contaminated hypodermic needles. It is important to know how each different kind of virus is spread to prevent infections and epidemics. There are many types of plant virus, but often they only cause a loss of yield, and it is not economically viable to try to control them. Plant viruses are often spread from plant to plant by organisms, known as *vectors*.

These are normally insects, but some fungi, nematode worms and single-celled organisms have been shown to be vectors. When control of plant virus infections is considered economical, (for perennial fruits for example), efforts are concentrated on killing the vectors and removing alternate hosts such as weeds. Plant viruses are harmless to humans and other animals because they can only reproduce in living plant cells.

Exercise 14. Make up some dialogues from the information above.

Exercise 15. Render the main idea of the information.

Exercise 16. Read the information & pick up the essential details in the form of quick notes.

Exercise 17. Characterize bacteriophages shortly.

Bacteriophages are viruses that infect bacteria. There are over 5,100 types of bacteriophages.

They are important in marine ecology: as the infected bacteria burst, carbon compounds are released back into the environment, which stimulates fresh organic growth. Bacteriophages are useful in scientific research because they are harmless to humans and can be studied easily. These viruses can be a problem in industries that produce food and drugs by fermentation and depend on healthy bacteria. Some bacterial infections are becoming difficult to control with antibiotics, so there is a growing interest in the use of bacteriophages to treat infections in humans.

Exercise 18. Describe innate immunity of animals.

Animals, including humans, have many natural defences against viruses. Some are non-specific and protect against many viruses regardless of the type. This innate immunity is not improved by repeated exposure to viruses and does not retain a "memory" of the infection. The skin of animals, particularly its surface, which is made from dead cells, prevents many types of viruses from infecting the host. The acidity of the contents of the stomach kills many viruses that have been swallowed.

When a virus overcomes these barriers and enters the host, other innate defences prevent the spread of infection in the body. A special hormone called interferon is produced by the body when viruses are present, and this stops the viruses from reproducing by killing the infected cell and its close neighbours. Inside cells, there are enzymes that destroy the RNA of viruses. This is called RNA interference. Some blood cells engulf and destroy other virus infected cells.

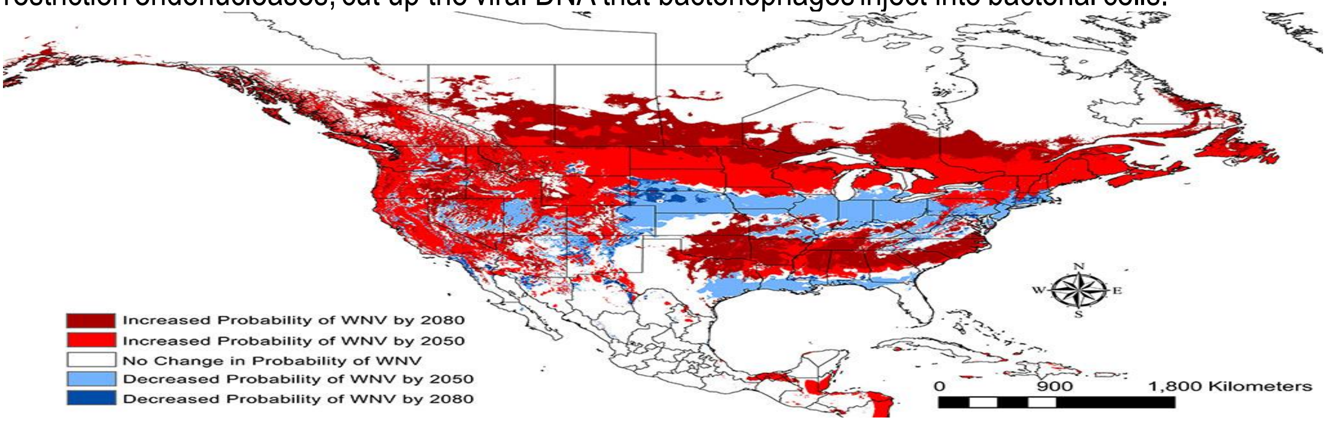
Exercise 19. Define adaptive immunity of animals.

Two rotaviruses: the one on the right is coated with antibodies which stop its attaching to cells and infecting them. Specific immunity to viruses develops over time and white blood cells called lymphocytes play a central role. Lymphocytes retain a "memory" of virus infections and produce many special molecules called antibodies. These antibodies attach to viruses and stop the virus from infecting cells. Antibodies are highly selective and attack only one type of virus. The body makes many different antibodies, especially during the initial infection, however, after the infection subsides, some antibodies remain and continue to be produced, often giving the host life-long immunity to the virus.

Exercise 20. Explain plant resistance.

Plants have elaborate and effective defence mechanisms against viruses. One of the most effective is the presence of so-called resistance (R) genes. Each R gene confers resistance to a particular virus by triggering localised areas of cell death around the infected cell, which can often be seen with the unaided eye as large spots. This stops the infection from spreading. RNA interference is also an effective defence in plants.

When they are infected, plants often produce natural disinfectants which kill viruses, such as salicylic acid, nitric oxide and reactive oxygen molecules. The major way bacteria defend themselves from bacteriophages is by producing enzymes which destroy foreign DNA. These enzymes, called restriction endonucleases, cut up the viral DNA that bacteriophages inject into bacterial cells.



Exercise 21. Expound prevention and treatment of viral disease in humans and other animals.

Vaccination is a way of preventing diseases caused by viruses. Vaccines simulate a natural infection and its associated immune response, but do not cause the disease. Their use has resulted in a dramatic decline in illness and death caused by infections such as polio, measles, mumps and rubella. Vaccines are available to prevent over thirteen viral infections of humans and more are used to prevent viral infections of animals. Vaccines may consist of either live or killed viruses.

Live vaccines contain weakened forms of the virus, but these vaccines can be dangerous when given to people with weak immunity.

The structure of DNA showing the position of the nucleosides and the phosphorus atoms that form the "backbone" of the molecule. In these people, the weakened virus can cause the original disease. Biotechnology and genetic engineering techniques are used to produce "designer" vaccines that only have the capsid proteins of the virus. Hepatitis B vaccine is an example of this type of vaccine. These vaccines are safer because they can never cause the disease.

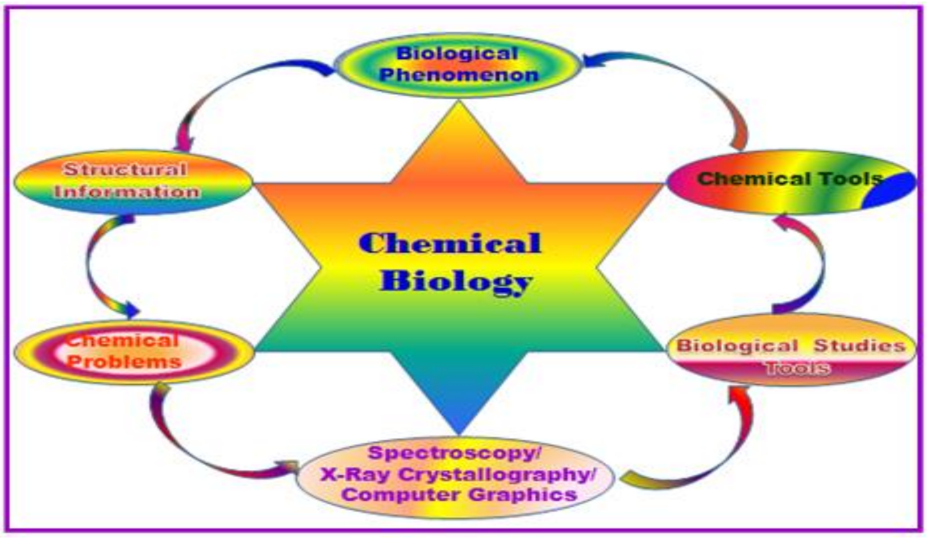
Over the past 20 years, the development of antiviral drugs has increased rapidly, mainly driven by the AIDS pandemic. Antiviral drugs are often nucleoside analogues, which are molecules very similar, but not identical to DNA building blocks. When the replication of virus DNA begins, some of these fake building blocks are incorporated. As soon as that happens, replication stops prematurely — the fake building blocks lack the essential features that allow the addition of further building blocks.

Thus, DNA production is halted, and the virus can no longer reproduce. Examples of nucleoside analogues are aciclovir for herpes virus infections and lamivudine for HIV and hepatitis B virus infections. Aciclovir is one of the oldest and most frequently prescribed antiviral drugs.

Other antiviral drugs target different stages of the viral life cycle. HIV is dependent on an enzyme called the HIV-1 protease for the virus to become infectious. There is a class of drugs called protease inhibitors, which bind to this enzyme and stop it from functioning.

Hepatitis C is caused by an RNA virus. In 80% of people infected, the disease becomes chronic, and they remain infectious for the rest of their lives unless they are treated. There is an effective treatment that uses the nucleoside analogue drug ribavirin combined with interferon.

The treatment for chronic carriers of the hepatitis B virus by a similar strategy using lamivudine is being developed. In both diseases, the ribavirin stops the virus from reproducing and the interferon kills any remaining infected cells. HIV infections are usually treated with a combination of antiviral drugs, each targeting a different stage in the virus's life-cycle. There are drugs that prevent the virus from attaching to cells, others that are nucleoside analogues and some poison the virus's enzymes that it needs to reproduce. The success of these drugs is proof of the importance of knowing how viruses reproduce.



TOPICAL VOCABULARY

vaccination – прививка оспы; вакцинация

to carry out (do a mass) a vaccination of the population – проводить массовую вакцинацию населения

to carry out a mass vaccination against tuberculosis – делать всем прививки, проводить массовую вакцинацию против туберкулёза

compulsory vaccination – обязательная прививка

renewed vaccination – ревакцинация

to **vaccinate –** применять вакцину, вакцинировать, делать прививку

to vaccinate smb. against (with) a disease – делать прививку против болезни

If you are travelling to a tropical country, you should be vaccinated against yellow fever. – Если вы едете в тропическую страну, вам обязательно нужно сделать прививку против жёлтой лихорадки.

vaccinating center – прививочный центр или пункт

vaccinating (vaccine) strain – вакцинный штамм (исходный штамм для приготовления вакцины)

vaccinal – вакцинный

vaccinal prevention – вакцинопрофилактика

vaccinal fever – вакцинальная лихорадка

vaccigenous – образующий вакцину

vaccinationist – вакцинатор (лицо, производящее вакцинацию) *Syn. vaccinator*

viral – вирусный viral pneumonia – вирусная пневмония

viral antigen – вирусный антиген

viral code – вирусная программа

viral DNA – вирусная (вирусспецифическая) ДНК

viral hepatitis – вирусный гепатит

viremia – вир(ус)емия (наличие вируса в крови)

virus – вирус

There are many different strains of flu virus. – Имеется много штаммов вируса гриппа.

influenza virus – вирус гриппа

intestinal virus – кишечная инфекция

slow virus – вирус с длительным инкубационным процессом

virus warfare – б) вирусное заболевание, вирусная инфекция

Hackers are said to have started a new computer virus. – Говорят, что хакеры запустили новый компьютерный вирус.

AIDS virus – вирус СПИДа

air-borne virus – вирус, передающийся воздушным путём

circulative virus – циркулирующий (передающийся потомству) вирус

computer virus – компьютерный вирус

attenuated virus – ослабленный вирус

immunodeficiency virus – вирус иммунодефицита

oncogenic (tumor) virus – онкогенный, опухолеродный вирус

virus carrier – вирусоноситель

gene – ген gene bank — банк генов

gene bibliotheque – клонотека генов, генотека

gene complement – набор генов

to transfer genes – пересаживать гены *Syn. transplant*

to cut genes – расщеплять гены

to splice genes – соединять гены

dominant gene – доминантный ген

recessive gene – рецессивный ген
chorion gene – сложный (составной) ген
dominant gene – доминантный ген
epistatic gene – эпистатический ген (подавляющий проявление других генов)
jumping gene – прыгающий (перемещающийся) ген
lethal gene – летальный ген
maternal gene – материнский ген
mutator gene – ген-мутатор
paternal gene – отцовский ген
rate gene – ген скорости развития (контролирующий развитие и рост клеток)
structural gene – структурный ген (закодирована информация о первичной структуре белка)
truncated gene – укороченный ген
alpha gene – ген иммуноглобулина А
complex genes – комплексные гены
incompatibility genes – гены несовместимости
inert gene – инертный ген
gene activation – активация гена
gene engineering – генная инженерия (создание рекомбинантных ДНК)
gene frequency – частота генов, генная концентрация
gene interaction – взаимодействие генов
gene pool – генетический фонд, генофонд
gene therapy – генная терапия

germ – зародыш, эмбрион *Syn. germ cell;* бактерия, микроб, микроорганизм
in germ – в зародыше, в зачаточном состоянии
wheat germ – пшеничный зародыш
germs multiply – микробы размножаются
(some) germs cause disease – микроорганизмы вызывают болезни
germ warfare – война с применением бактериологического оружия
to **germ** – давать ростки, развиваться

New projects were germing in his ever fertile brain. – Новые проекты развивались в его полной всяких идей голове.

disease-producing (pathogenic) germ – патогенный микроорганизм
germ carrier – бациллоноситель
germ culture – микробная культура
germ disease – инфекционная болезнь
germ cell – зародышевая клетка
germ plasm – зародышевая плазма, ядро гаметы
the germ of an idea – зарождающаяся идея

The germ of something such as an idea is something which developed or might develop into that thing. The germ of an idea took root in Rosemary's mind. This was the germ of a book.

Exercise 1. Analyze the topical vocabulary and use it in practice.

Exercise 2. Summarize your findings on viruses and issue in a short presentation.

GENE

A **gene** is the basic unit of heredity in a living organism. All living things depend on genes. Genes hold the information to build and maintain their cells and pass genetic traits to offspring.

A modern working definition of a gene is "a locatable region of genomic sequence, corresponding to a unit of inheritance, which is associated with regulatory regions, transcribed regions, and or other functional sequence regions ".

Incorrect colloquial usage of the term gene may actually refer to an allele: a gene is the basic instruction, a sequence of DNA, while an allele is one variant of that instruction. The notion of a gene is evolving with the science of genetics, which began when Gregor Mendel noticed that biological variations are inherited from parent organisms as specific, discrete traits. The biological entity responsible for defining traits was termed a gene, but the biological basis for inheritance remained unknown until DNA was identified as the genetic material in the 1940s.

All organisms have many genes corresponding to many different biological traits, some of which are immediately visible, such as eye color or number of limbs, and some of which are not, such as blood type or increased risk for specific diseases, or the thousands of basic biochemical processes that comprise life. In cells, a gene is a portion of DNA that contains both "coding" sequences that determine what the gene does, and "non-coding" sequences that determine when the gene is active (expressed). When a gene is active, the coding and non-coding sequences are copied in a process called transcription, producing an RNA copy of the gene's information.

This piece of RNA can then direct the synthesis of proteins via the genetic code. In other cases, the RNA is used directly, for example as part of the ribosome.

The molecules resulting from gene expression, whether RNA or protein, are known as gene products, and are responsible for the development and functioning of all living things.

The physical development and phenotype of organisms can be thought of as a product of genes interacting with each other and with the environment. A concise definition of a gene, taking into account complex patterns of regulation and transcription, genic conservation and non-coding RNA genes, has been proposed by Gerstein et al.: "A gene is a union of genomic sequences encoding a coherent set of potentially overlapping functional products".

The existence of genes was first suggested by Gregor Mendel (1822-1884), who, in the 1860s, studied inheritance in peaplants (*Pisum sativum*) and hypothesized a factor that conveys traits from parent to offspring. He spent over 10 years of his life on one experiment. Although he did not use the term *gene*, he explained his results in terms of inherited characteristics.

Mendel was also the first to hypothesize independent assortment, the distinction between dominant and recessive traits, the distinction between a heterozygote and homozygote, and the difference between what would later be described as genotype (the genetic material of an organism) and phenotype (the visible traits of that organism). Mendel's concept was given a name by Hugo de Vries in 1889, who, at that time probably unaware of Mendel's work, in his book *Intracellular Pangenesis* coined the term "pangen" for "the smallest particle one hereditary characteristic".

Wilhelm Johannsen abbreviated this term to "gene" ("gen" in Danish and German) two decades later. In the early 1900s, Mendel's work received renewed attention from scientists.

In 1910, Thomas Hunt Morgan showed that genes reside on specific chromosomes. He later showed that genes occupy specific locations on the chromosome. With this knowledge, Morgan and his students began the first chromosomal map of the fruit fly *Drosophila*.

In 1928, Frederick Griffith showed that genes could be transferred. In what is now known as Griffith's experiment, injections into a mouse of a deadly strain of bacteria that had been heat-killed transferred genetic information to a safe strain of the same bacteria, killing the mouse.

In 1941, George Wells Beadle and Edward Lawrie Tatum showed that mutations in genes caused errors in specific steps in metabolic pathways.

This showed that specific genes code for specific proteins, leading to the "one gene, one enzyme" hypothesis. Oswald Avery, Colin Munro MacLeod, and Maclyn McCarty showed in 1944 that DNA holds the gene's information.

In 1953, James D. Watson and Francis Crick demonstrated the molecular structure of DNA.

Together, these discoveries established the central dogma of molecular biology, which states that proteins are translated from RNA which is transcribed from DNA. This dogma has since been shown to have exceptions, such as reverse transcription in retroviruses.

In 1972, Walter Fiers and his team at the Laboratory of Molecular Biology of the University of Ghent (Ghent, Belgium) were the first to determine the sequence of a gene: the gene for Bacteriophage MS2 coat protein.

Richard J. Roberts and Phillip Sharp discovered in 1977 that genes can be split into segments.

This leads to the idea that one gene can make several proteins. Recently biological results let the notion of gene appear more slippery. In particular, genes do not seem to sit side by side on DNA like discrete beads. Instead, regions of the DNA producing distinct proteins may overlap, so that the idea emerges that "genes are one long continuum".

Exercise 1. Give the main idea of the text in some English sentences.

Exercise 2. Analyze the role of mendelian inheritance and classical genetics.

Exercise 3. Analyze the physical definitions.

The vast majority of living organisms encode their genes in long strands of DNA.

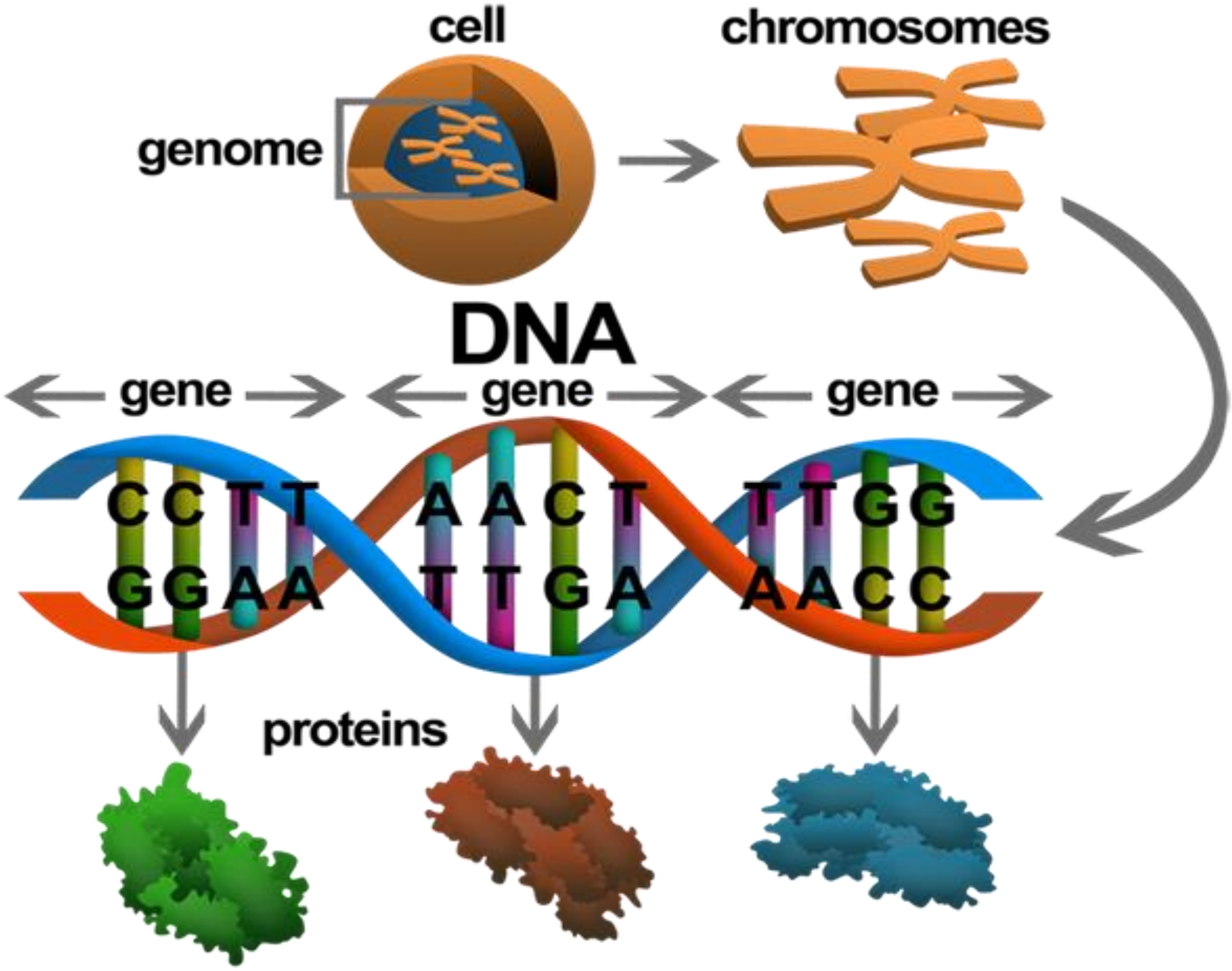
DNA consists of a chain made from four types of nucleotide subunits: adenine, cytosine, guanine, and thymine. Each nucleotide subunit consists of three components: a phosphate group, a deoxyribose sugar ring, and a nucleobase.

Thus, nucleotides in DNA or RNA are typically called "bases"; as a consequence, they are commonly referred to simply by their purine or pyrimidine original base components adenine, cytosine, guanine, thymine. Adenine and guanine are purines, and cytosine and thymine are pyrimidines.

The most common form of DNA in a cell is in a double helix structure, in which two individual DNA strands twist around each other in a right-handed spiral. In this structure, the base pairing rules specify that guanine pairs with cytosine and adenine pairs with thymine (each pair contains one purine and one pyrimidine). The base pairing between guanine and cytosine forms three hydrogen bonds. whereas the base pairing between adenine and thymine forms two hydrogen bonds.

The two strands in a double helix must therefore be *complementary*, that is, their bases must align such that the adenines of one strand are paired with the thymines of the other strand, and so on.

Due to the chemical composition of the pentose residues of the bases, DNA strands have directionality. One end of a DNA polymer contains an exposed hydroxyl group on the deoxyribose; this is known as the 3' end of the molecule. The other end contains an exposed phosphate group; this is the 5' end. The directionality of DNA is vitally important to many cellular processes, since double helices are necessarily directional (a strand running 5'-3' pairs with a complementary strand running 3'-5'), and processes such as DNA replication occur in only one direction. All nucleic acid synthesis in a cell occurs in the 5'-3' direction, because new monomers are added via a dehydration reaction that uses the exposed 3' hydroxyl as a nucleophile.



CLASSICAL GENETICS

Darwin used the term Gemmule to describe a microscopic unit of inheritance, and what would later become known as Chromosomes had been observed separating out during cell division by Wilhelm Hofmeister as early as 1848. The idea that chromosomes are the carriers of inheritance was expressed in 1883 by Wilhelm Roux. The modern conception of the gene originated with work by Gregor Mendel, a 19th-century Augustinian monk who systematically studied heredity in pea plants.

Mendel's work was the first to illustrate particulate inheritance, or the theory that inherited traits are passed from one generation to the next in discrete units that interact in well-defined ways.

Danish botanist Wilhelm Johannsen coined the word "gene" in 1909 to describe these fundamental physical and functional units of heredity, while the related word genetics was first used by William Bateson in 1905. The word was derived from Hugo de Vries' 1889 term "*pangen*" for the same concept, itself a derivative of the word "*pangenesis*" coined by Darwin (1868).

The word **pangenesis** is made from the Greek words *pan* (a prefix meaning "whole", "encompassing") and *genesis* ("birth") or *genos* ("origin"). According to the theory of Mendelian inheritance, variations in phenotype – the observable physical and behavioral characteristics of an organism – are due to variations in genotype, or the organism's particular set of genes, each of which specifies a particular trait. Different forms of a gene, which may give rise to different phenotypes, are known as alleles.

Organisms such as the pea plants Mendel worked on, along with many plants and animals, have two alleles for each trait, one inherited from each parent. Alleles may be dominant or recessive; dominant alleles give rise to their corresponding phenotypes when paired with any other allele for the same trait. Whereas recessive alleles give rise to their corresponding phenotype only when paired with another copy of the same allele.

For example, if the allele specifying tall stems in pea plants is dominant over the allele specifying short stems, then pea plants that inherit one tall allele from one parent and one short allele from the other parent will also have tall stems. Mendel's work found that alleles assort independently in the production of gametes, or germ cells, ensuring variation in the next generation.

Prior to Mendel's work, the dominant theory of heredity was one of blending inheritance, which proposes that the traits of the parents blend or mix in a smooth, continuous gradient in the offspring.

Although Mendel's work was largely unrecognized after its first publication in 1866, it was rediscovered in 1900 by three European scientists, Hugo de Vries, Carl Correns, and Erich von Tschermak, who had reached similar conclusions from their own research.

However, these scientists were not yet aware of the identity of the "discrete units" on which genetic material resides. A series of subsequent discoveries led to the realization decades later that chromosomes within cells are the carriers of genetic material, and that they are made of DNA (deoxyribonucleic acid), a polymeric molecule found in all cells on which the 'discrete units' of Mendelian inheritance are encoded. The modern study of genetics at the level of DNA is known as molecular genetics and the synthesis of molecular genetics with traditional Darwinian evolution is known as the modern evolutionary synthesis.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Render the role of RNA genes and genomes.

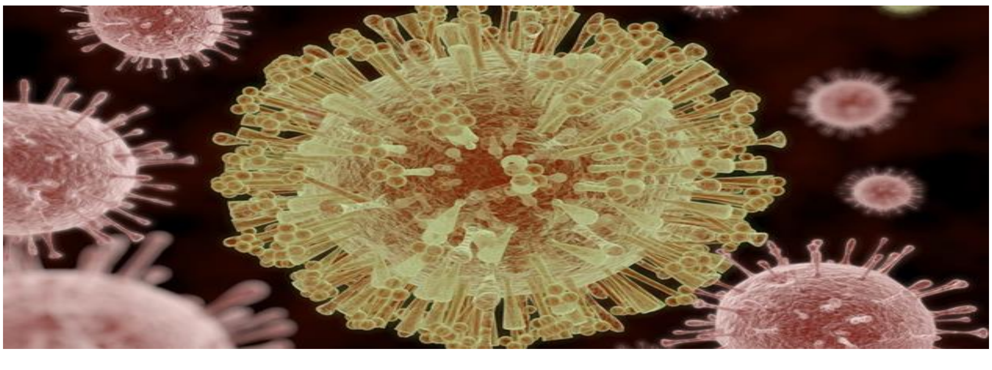
The expression of genes encoded in DNA begins by transcribing the gene into RNA, a second type of nucleic acid that is very similar to DNA, but whose monomers contain the sugar ribose rather than deoxyribose. RNA also contains the base uracil in place of thymine. RNA molecules are less stable than DNA and are typically single-stranded. Genes that encode proteins are composed of a series of three-nucleotide sequences called codons, which serve as the *words* in the genetic *language*. The genetic code specifies the correspondence during protein translation between codons and amino acids. The genetic code is nearly the same for all known organisms.

In some cases, RNA is an intermediate product in the process of manufacturing proteins from genes. However, for other gene sequences, the RNA molecules are the actual functional products.

For example, RNAs known as ribozymes are capable of enzymatic function, and miRNAs have a regulatory role. The DNA sequences from which such RNAs are transcribed are known as RNA genes. Some viruses store their entire genomes in the form of RNA, and contain no DNA at all. Because they use RNA to store genes, their cellular hosts may synthesize their proteins as soon as they are infected and without the delay in waiting for transcription.

On the other hand, RNA retroviruses, such as HIV, require the reverse transcription of their genome from RNA into DNA before their proteins can be synthesized.

In 2006, French researchers came across a puzzling example of RNA-mediated inheritance in mouse. Mice with a loss-of-function mutation in the gene Kit have white tails. Offspring of these mutants can have white tails despite having only normal Kit genes. The research team traced this effect back to mutated Kit RNA. While RNA is common as genetic storage material in viruses, in mammals in particular RNA inheritance has been observed very rarely.



FUNCTIONAL STRUCTURE OF A GENE

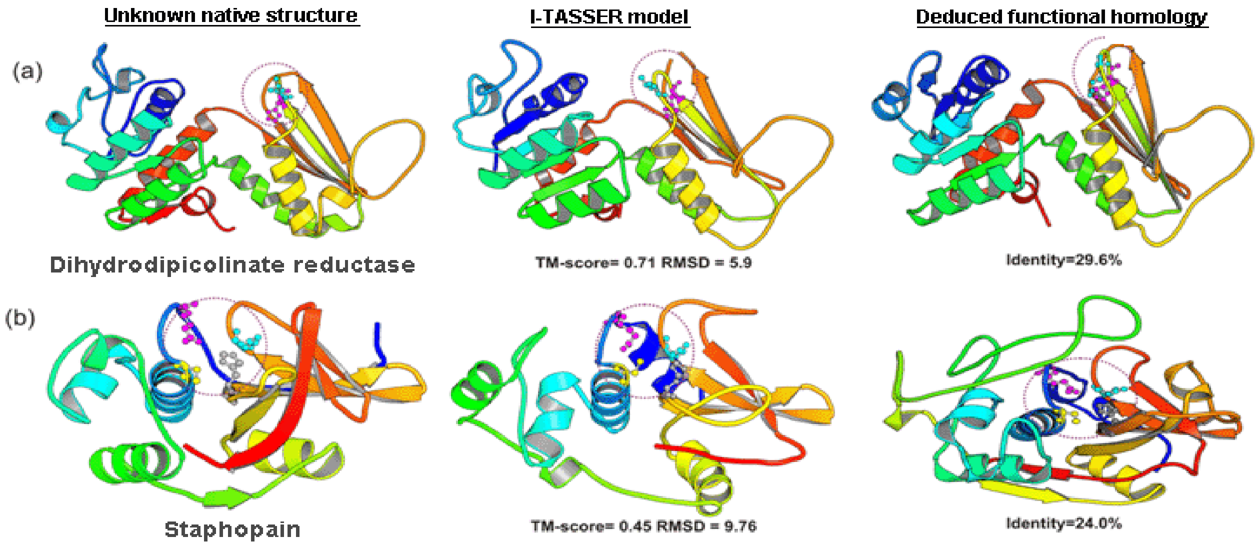


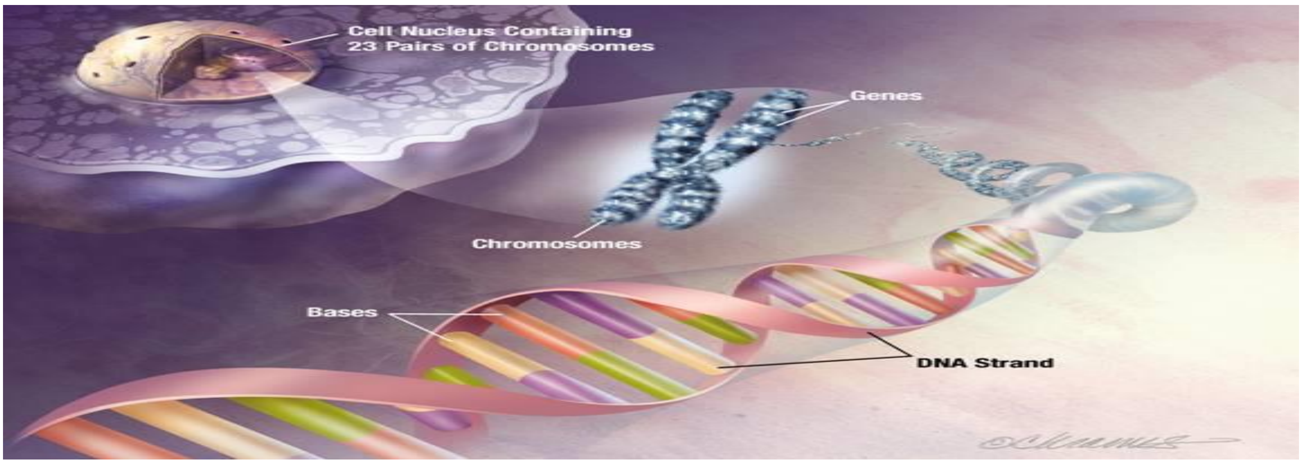
Diagram of the "typical" eukaryotic protein-coding **gene**. Promoters and enhancers determine what portions of the DNA will be transcribed into the precursor mRNA (pre-mRNA). The pre-mRNA is then spliced into messenger RNA (mRNA) which is later translated into protein.

All genes have regulatory regions in addition to regions that explicitly code for a protein or RNA product. A regulatory region shared by almost all genes is known as the promoter, which provides a position that is recognized by the transcription machinery when a gene is about to be transcribed and expressed. A gene can have more than one promoter, resulting in RNAs that differ in how far they extend in the 5' end. Although promoter regions have a consensus sequence that is the most common sequence at this position, some genes have "strong" promoters that bind the transcription machinery well, and others have "weak" promoters that bind poorly.

These weak promoters usually permit a lower rate of transcription than the strong promoters, because the transcription machinery binds to them and initiates transcription less frequently. Other possible regulatory regions include enhancers, which can compensate for a weak promoter.

Most regulatory regions are "upstream" – that is, before or toward the 5' end of the transcription initiation site. Eukaryotic promoter regions are much more complex and difficult to identify than prokaryotic promoters. Many prokaryotic genes are organized into operons, or groups of genes whose products have related functions and which are transcribed as a unit. By contrast, eukaryotic genes are transcribed only one at a time, but may include long stretches of DNA called introns which are transcribed but never translated into protein (they are spliced out before translation).

Splicing can occur in prokaryotic genes, but is less common than in eukaryotes.



Exercise 1. Explain the notion «chromosomes».

The total complement of genes in an organism or cell is known as its genome, which may be stored on one or more chromosomes; the region of the chromosome at which a particular gene is located is called its locus. A chromosome consists of a single, very long DNA helix on which thousands of genes are encoded.

Prokaryotes – bacteria and archaea – typically store their genomes on a single large, circular chromosome, sometimes supplemented by additional small circles of DNA called plasmids, which usually encode only a few genes and are easily transferable between individuals.

For example, the genes for antibiotic resistance are usually encoded on bacterial plasmids and can be passed between individual cells, even those of different species, via horizontal gene transfer.

Although some simple eukaryotes also possess plasmids with small numbers of genes, the majority of eukaryotic genes are stored on multiple linear chromosomes, which are packed within the nucleus in complex with storage proteins called histones. The manner in which DNA is stored on the histone, as well as chemical modifications of the histone itself, are regulatory mechanisms governing whether a particular region of DNA is accessible for gene expression.

The ends of eukaryotic chromosomes are capped by long stretches of repetitive sequences called telomeres, which do not code for any gene product but are present to prevent degradation of coding and regulatory regions during DNA replication. The length of the telomeres tends to decrease each time the genome is replicated in preparation for cell division; the loss of telomeres has been proposed as an explanation for cellular senescence, or the loss of the ability to divide, and by extension for the aging process in organisms. Whereas the chromosomes of prokaryotes are relatively gene-dense, those of eukaryotes often contain so-called "junk DNA", or regions of DNA that serve no obvious function. Simple single-celled eukaryotes have relatively small amounts of such DNA.

Exercise 2. Define the notion «gene expression».

In all organisms, there are two major steps separating a protein-coding gene from its protein.

First, the DNA on which the gene resides must be *transcribed* from DNA to messenger RNA (mRNA); and, second, it must be *translated* from mRNA to protein. RNA-coding genes must still go through the first step, but are not translated into protein.

The process of producing a biologically functional molecule of either RNA or protein is called gene expression, and the resulting molecule itself is called a gene product. The genetic code is the set of rules by which a gene is translated into a functional protein.

Each gene consists of a specific sequence of nucleotides encoded in a DNA (or sometimes RNA) strand; a correspondence between nucleotides, the basic building blocks of genetic material, and amino acids, the basic building blocks of proteins, must be established for genes to be successfully translated into functional proteins.

Sets of three nucleotides, known as codons, each correspond to a specific amino acid or to a signal; three codons are known as "stop codons" and, instead of specifying a new amino acid, alert the translation machinery that the end of the gene has been reached.

There are 64 possible codons (four possible nucleotides at each of three positions, hence 4^3 possible codons) and only 20 standard amino acids; hence the code is redundant and multiple codons can specify the same amino acid. The correspondence between codons and amino acids is nearly universal among all known living organisms.

Exercise 3. Specify the notion «genetic transcription».

The process of genetic transcription produces a single-stranded RNA molecule known as messenger RNA, whose nucleotide sequence is complementary to the DNA from which it was transcribed. The DNA strand whose sequence matches that of the RNA is known as the coding strand and the strand from which the RNA was synthesized is the template strand. Transcription is performed by an enzyme called an RNA polymerase, which reads the template strand in the 3' to 5' direction and synthesizes the RNA from 5' to 3'. To initiate transcription, the polymerase first recognizes and binds a promoter region of the gene. Thus a major mechanism of gene regulation is the blocking or sequestering of the promoter region, either by tight binding by repressor molecules that physically block the polymerase, or by organizing the DNA so that the promoter region is not accessible.

In prokaryotes, transcription occurs in the cytoplasm; for very long transcripts, translation may begin at the 5' end of the RNA while the 3' end is still being transcribed. In eukaryotes, transcription necessarily occurs in the nucleus, where the cell's DNA is sequestered; the RNA molecule produced by the polymerase is known as the primary transcript and must undergo post-transcriptional modifications before being exported to the cytoplasm for translation. The splicing of introns present within the transcribed region is a modification unique to eukaryotes; alternative splicing mechanisms can result in mature transcripts from the same gene having different sequences and thus coding for different proteins. This is a major form of regulation in eukaryotic cells.

Exercise 4. Describe the process of translation.

Translation is the process by which a mature mRNA molecule is used as a template for synthesizing a new protein. Translation is carried out by ribosomes, large complexes of RNA and protein responsible for carrying out the chemical reactions to add new amino acids to a growing polypeptide chain by the formation of peptide bonds. The genetic code is read three nucleotides at a time, in units called codons, via interactions with specialized RNA molecules called transfer RNA (tRNA). Each tRNA has three unpaired bases known as the anticodon that are complementary to the codon it reads; the tRNA is covalently attached to the amino acid specified by the complementary codon. When the tRNA binds to its complementary codon in an mRNA strand, the ribosome ligates its amino acid cargo to the new polypeptide chain, which is synthesized from amino terminus to carboxyl terminus. During and after its synthesis, the new protein must fold to its active three-dimensional structure before it can carry out its cellular function.

Exercise 5. Explain the notion «DNA replication and inheritance».

The growth, development, and reproduction of organisms relies on cell division, or the process by which a single cell divides into two usually identical daughter cells. This requires first making a duplicate copy of every gene in the genome in a process called DNA replication.

The copies are made by specialized enzymes known as DNA polymerases, which "read" one strand of the double-helical DNA, known as the template strand, and synthesize a new complementary strand. Because the DNA double helix is held together by base pairing, the sequence of one strand completely specifies the sequence of its complement; hence only one strand needs to be read by the enzyme to produce a faithful copy. The process of DNA replication is semiconservative; that is, the copy of the genome inherited by each daughter cell contains one original and one newly synthesized strand of DNA. After DNA replication is complete, the cell must physically separate the two copies of the genome and divide into two distinct membrane-bound cells. In prokaryotes – bacteria and archaea – this usually occurs via a relatively simple process called binary fission, in which each circular genome attaches to the cell membrane and is separated into the daughter cells as the membrane invaginates to split the cytoplasm into two membrane-bound portions. Binary fission is extremely fast compared to the rates of cell division in eukaryotes. Eukaryotic cell division is a more complex process known as the cell cycle; DNA replication occurs during a phase of this cycle known as S phase.

Exercise 6. Find in the text English equivalents to Russian ones.

Эукариоты, клеточная мембрана, хромосома, спаривание оснований нуклеиновых кислот, полимераза (фермент), репликация ДНК, дочерняя клетка, деление клетки (цитокинез), трафарет (шаблон), аминокислоты, полипептидная цепь, пептидная связь, сформировавшийся, разделение хромосом, протоплазма клетки (цитоплазма), деление на 2 части, цикл деления клетки, расщепление, полуконсервативный (о синтезе ДНК), рибосома, генетический материал, поколение, клетка, молекулярное наследие, потомок, бесполый, двойник, пересаживать гены, расщеплять гены, соединять гены, доминантный ген, рецессивный ген.

Exercise* 7. *Analyze the problems of molecular inheritance.

The duplication and transmission of genetic material from one generation of cells to the next is the basis for molecular inheritance, and the link between the classical and molecular pictures of genes.

Organisms inherit the characteristics of their parents because the cells of the offspring contain copies of the genes in their parents' cells. In asexually reproducing organisms, the offspring will be a genetic copy or clone of the parent organism. In sexually reproducing organisms, a specialized form of cell division called meiosis produces cells called gametes or germ cells that are haploid, or contain only one copy of each gene. The gametes produced by females are called eggs or ova, and those produced by males are called sperm. Two gametes fuse to form a fertilized egg, a single cell that once again has a diploid number of genes – each with one copy from the mother and one copy from the father. During the process of meiotic cell division, an event called genetic recombination or crossing-over can sometimes occur, in which a length of DNA on one chromatid is swapped with a length of DNA on the corresponding sister chromatid. This has no effect if the alleles on the chromatids are the same, but results in reassortment of otherwise linked alleles if they are different.

The Mendelian principle of independent assortment asserts that each of a parent's two genes for each trait will sort independently into gametes; which allele an organism inherits for one trait is unrelated to which allele it inherits for another trait. This is in fact only true for genes that do not reside on the same chromosome, or are located very far from one another on the same chromosome.

The closer two genes lie on the same chromosome, the more closely they will be associated in gametes and the more often they will appear together; genes that are very close are essentially never separated because it is extremely unlikely that a crossover point will occur between them. This is known as genetic linkage.

***Exercise 8. Explain the score of the notion* «*mutation*».**

DNA replication is for the most part extremely accurate, with an error rate per site of around 10^{-6} to 10^{-10} in eukaryotes. Rare, spontaneous alterations in the base sequence of a particular gene arise from a number of sources, such as errors in DNA replication and the aftermath of DNA damage.

These errors are called mutations. The cell contains many DNA repair mechanisms for preventing mutations and maintaining the integrity of the genome; however, in some cases – such as breaks in both DNA strands of a chromosome – repairing the physical damage to the molecule is a higher priority than producing an exact copy. Due to the degeneracy of the genetic code, some mutations in protein-coding genes are silent. Mutations propagated to the next generation lead to variations within a species' population. Variants of a single gene are known as alleles, and differences in alleles may give rise to differences in traits.

Although it is rare for the variants in a single gene to have clearly distinguishable phenotypic effects, certain well-defined traits are in fact controlled by single genetic loci. A gene's most common allele is called the wild type allele, and rare alleles are called mutants. However, this does not imply that the wild-type allele is the ancestor from which the mutants are descended.

Exercise 9. Analyze the information, which is in the highlight, and use it in practice.

CHROMOSOMAL ORGANIZATION

The total complement of genes in an organism or cell is known as its genome. In prokaryotes, the vast majority of genes are located on a single chromosome of circular DNA, while eukaryotes usually possess multiple individual linear DNA helices packed into dense DNA-protein complexes called chromosomes. Genes that appear together on one chromosome of one species may appear on separate chromosomes in another species.

Many species carry more than one copy of their genome within each of their somatic cells. Cells or organisms with only one copy of each chromosome are called haploid; those with two copies are called diploid; and those with more than two copies are called polyploid.

The copies of genes on the chromosomes are not necessarily identical. In sexually reproducing organisms, one copy is normally inherited from each parent. Most of the genome gives rise to RNA products however, but not much is known about the function of these non-coding RNAs.

Evolutionary concept of a gene

George C. Williams first explicitly advocated the gene-centric view of evolution in his 1966 book *Adaptation and Natural Selection*. He proposed an evolutionary concept of gene to be used when we are talking about natural selection favoring some genes. The definition is: "that which segregates and recombines with appreciable frequency." According to this definition, even an asexual genome could be considered a gene, insofar that it have an appreciable permanency through many generations.

The difference is: the molecular gene *transcribes* as a unit, and the evolutionary gene *inherits* as a unit. Richard Dawkins' books *The Selfish Gene* (1976) and *The Extended Phenotype* (1982) defended the idea that the gene is the only replicator in living systems. This means that only genes transmit their structure largely intact and are potentially immortal in the form of copies.

So, genes should be the unit of selection. In *The Selfish Gene* Dawkins attempts to redefine the word "gene" to mean "an inheritable unit" instead of the generally accepted definition of "a section of DNA coding for a particular protein". In *River Out of Eden*, Dawkins further refined the idea of gene-centric selection by describing life as a river of compatible genes flowing through geological time. Scoop up a bucket of genes from the river of genes, and we have an organism serving as temporary bodies or survival machines. A river of genes may fork into two branches representing two non-interbreeding species as a result of geographical separation.

Gene targeting and implications

Gene targeting is commonly referred to techniques for altering or disrupting mouse genes and provides the mouse models for studying the roles of individual genes in embryonic development, human disorders, aging and diseases. Gene targeting strategies have been expanded to all kinds of modifications, including point mutations, isoform deletions, mutant allele correction, large pieces of chromosomal DNA insertion and deletion, tissue specific disruption combined with spatial and temporal regulation and so on. It is predicted that the ability to generate mouse models with predictable phenotypes will have a major impact on studies of all phases of development, immunology, neurobiology, oncology, physiology, metabolism, and human diseases. Gene targeting is also in theory applicable to species from which totipotent embryonic stem cells can be established.

Exercise 1. Describe the chromosomal organization and try to understand the article.

Exercise 2. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 3. Describe the structure of DNA.

DNA is a long polymer made from repeating units called nucleotides.[2][3][4] The DNA chain is 22 to 26 Ångströms wide (2.2 to 2.6 nanometres), and one nucleotide unit is 3.3 Å (0.33 nm) long. Although each individual repeating unit is very small, DNA polymers can be very large molecules containing millions of nucleotides. For instance, the largest human chromosome, chromosome number 1, is approximately 220 million base pairs long. In living organisms, DNA does not usually exist as a single molecule, but instead as a pair of molecules that are held tightly together. These two long strands entwine like vines, in the shape of a double helix. The nucleotide repeats contain both the segment of the backbone of the molecule, which holds the chain together, and a base, which interacts with the other DNA strand in the helix. A base linked to a sugar is called a nucleoside and a base linked to a sugar and one or more phosphate groups is called a nucleotide. If multiple nucleotides are linked together, as in DNA, this polymer is called a polynucleotide.

Exercise 4. Explain the score of the changing concept popularly.

The concept of the gene has changed considerably. From the original definition of a "unit of inheritance", the term evolved to mean a DNA-based unit that can exert its effects on the organism through RNA or protein products. It was also previously believed that one gene makes one protein; this concept was overthrown by the discovery of alternative splicing and trans-splicing.

The definition of a gene is still changing. The first cases of RNA-based inheritance have been discovered in mammals. Evidence is also accumulating that the control regions of a gene do not necessarily have to be close to the coding sequence on the linear molecule or even on the same chromosome.

Spilianakis and colleagues discovered that the promoter region of the interferon-gamma gene on chromosome 10 and the regulatory regions of the T(H)2 cytokine locus on chromosome 11 come into close proximity in the nucleus possibly to be jointly regulated.

The concept that genes are clearly delimited is also being eroded. There is evidence for fused proteins stemming from two adjacent genes that can produce two separate protein products. While it is not clear whether these fusion proteins are functional, the phenomena is more frequent than previously thought. Even more ground-breaking than the discovery of fused genes is the observation that some proteins can be composed of exons from far away regions and even different chromosomes.

This new data has led to an updated, and probably tentative, definition of a gene as "a union of genomic sequences encoding a coherent set of potentially overlapping functional products." This new definition categorizes genes by functional products, whether they be proteins or RNA, rather than specific DNA loci; all its regulatory elements are classified as *gene-associated* regions.

Exercise 5. Define the notions "sense" and "antisense".

A DNA sequence is called "sense" if its sequence is the same as that of a messenger RNA copy that is translated into protein. The sequence on the opposite strand is called the "antisense" sequence. Both sense and antisense sequences can exist on different parts of the same strand of DNA (i.e. both strands contain both sense and antisense sequences).

One proposal is that antisense RNAs are involved in regulating gene expression through RNA-RNA base pairing. A few DNA sequences in prokaryotes and eukaryotes, and more in plasmids and viruses, blur the distinction between sense and antisense strands by having overlapping genes.

In these cases, some DNA sequences do double duty, encoding one protein when read along one strand, and a second protein when read in the opposite direction along the other strand.

In bacteria, this overlap may be involved in the regulation of gene transcription, while in viruses, overlapping genes increase the amount of information that can be encoded within the small viral genome.

Exercise 6. Make up some dialogues from the information above.

Exercise 7. Analyze the information and use it in practice.

GENETIC ENGINEERING

Methods have been developed to purify DNA from organisms, such as phenol-chloroform extraction and manipulate it in the laboratory, such as restriction digests and the polymerase chain reaction. Modern biology and biochemistry make intensive use of these techniques in recombinant DNA technology. Recombinant DNA is a man-made DNA sequence that has been assembled from other DNA sequences. They can be transformed into organisms in the form of plasmids or in the appropriate format, by using a viral vector. The genetically modified organisms produced can be used to produce products such as recombinant proteins, used in medical research, or be grown in agriculture.

Forensic scientists can use DNA in blood, semen, skin, saliva or hair found at a crime scene to identify a matching DNA of an individual, such as a perpetrator. This process is called genetic fingerprinting, or more accurately, DNA profiling. In DNA profiling, the lengths of variable sections of repetitive DNA, such as short tandem repeats and minisatellites, are compared between people.

This method is usually an extremely reliable technique for identifying a matching DNA. However, identification can be complicated if the scene is contaminated with DNA from several people.

DNA profiling was developed in 1984 by British geneticist Sir Alec Jeffreys, and first used in forensic science to convict Colin Pitchfork in the 1988 Enderby murders case. People convicted of certain types of crimes may be required to provide a sample of DNA for a database. This has helped investigators solve old cases where only a DNA sample was obtained from the scene.

DNA profiling can also be used to identify victims of mass casualty incidents. On the other hand, many convicted people have been released from prison on the basis of DNA techniques, which were not available when a crime had originally been committed.

Bioinformatics involves the manipulation, searching, and data mining of DNA sequence data.

The development of techniques to store and search DNA sequences have led to widely applied advances in computer science, especially string searching algorithms, machine learning and database theory. String searching or matching algorithms, which find an occurrence of a sequence of letters inside a larger sequence of letters, were developed to search for specific sequences of nucleotides.

In other applications such as text editors, even simple algorithms for this problem usually suffice, but DNA sequences cause these algorithms to exhibit near-worst-case behaviour due to their small number of distinct characters. The related problem of sequence alignment aims to identify homologous sequences and locate the specific mutations that make them distinct.

These techniques, especially multiple sequence alignment, are used in studying phylogenetic relationships and protein function. Data sets representing entire genomes' worth of DNA sequences, such as those produced by the Human Genome Project, are difficult to use without annotations, which label the locations of genes and regulatory elements on each chromosome. Regions of DNA sequence that have the characteristic patterns associated with protein- or RNA-coding genes can be identified by gene finding algorithms, which allow researchers to predict the presence of particular gene products in an organism even before they have been isolated experimentally.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Read the text and give the definition of DNA.

Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms and some viruses. The main role of DNA molecules is the long-term storage of information.

DNA is often compared to a set of blueprints or a recipe, or a code, since it contains the instructions needed to construct other components of cells, such as proteins and RNA molecules.

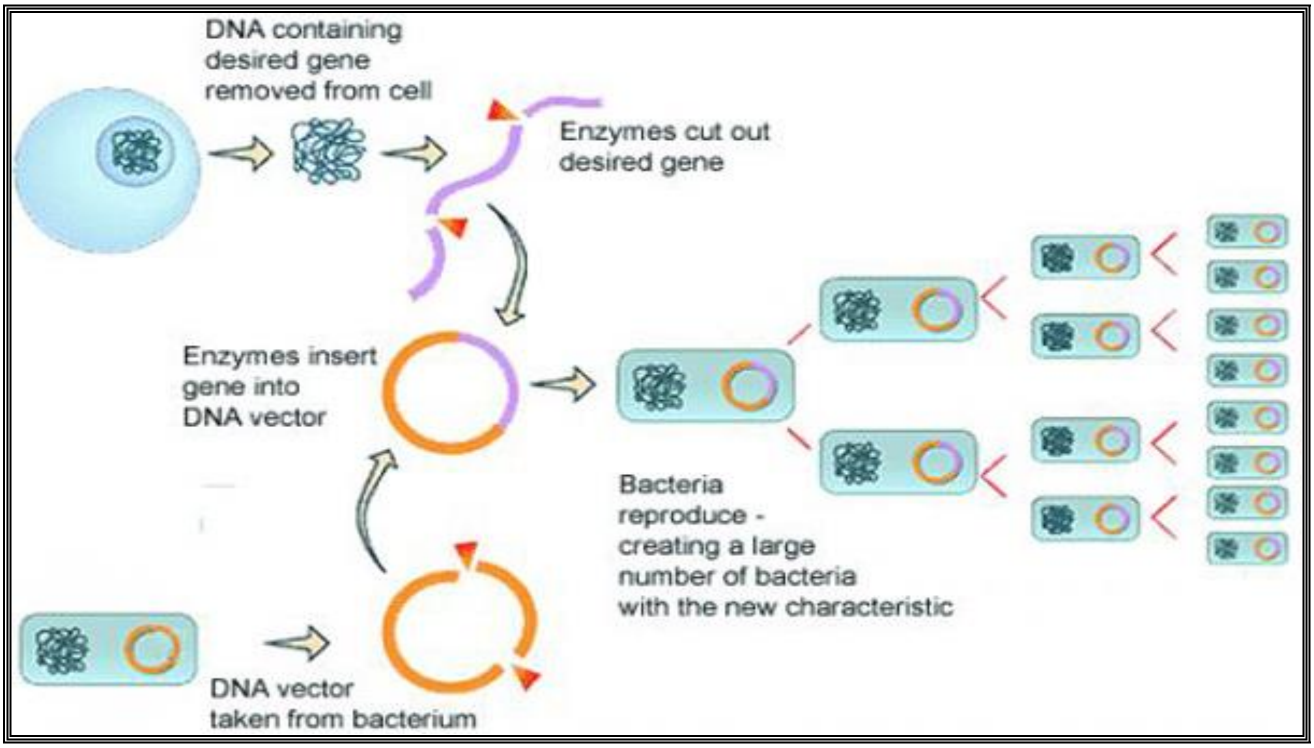
The DNA segments that carry this genetic information are called genes, but other DNA sequences have structural purposes, or are involved in regulating the use of this genetic information. Chemically, DNA consists of two long polymers of simple units called nucleotides, with backbones made of sugars and phosphate groups joined by ester bonds.

These two strands run in opposite directions to each other and are therefore anti-parallel. Attached to each sugar is one of four types of molecules called bases. It is the sequence of these four bases along the backbone that encodes information. This information is read using the genetic code, which specifies the sequence of the amino acids within proteins. The code is read by copying stretches of DNA into the related nucleic acid RNA, in a process called transcription.

Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called DNA replication. Eukaryotic organisms (animals, plants, fungi, and protists) store most of their DNA inside the cell nucleus and some of their DNA in organelles, such as mitochondria or chloroplasts.

Exercise 3. Classify the notion «supercoiling».

DNA can be twisted like a rope in a process called DNA supercoiling. With DNA in its "relaxed" state, a strand usually circles the axis of the double helix once every 10.4 base pairs, but if the DNA is twisted the strands become more tightly or more loosely wound. If the DNA is twisted in the direction of the helix, this is positive supercoiling, and the bases are held more tightly together. If they are twisted in the opposite direction, this is negative supercoiling, and the bases come apart more easily. In nature, most DNA has slight negative supercoiling that is introduced by enzymes called topoisomerases. These enzymes are also needed to relieve the twisting stresses introduced into DNA strands during processes such as transcription and DNA replication.



HISTORY OF DNA RESEARCH

DNA was first isolated by the Swiss physician Friedrich Miescher who, in 1869, discovered a microscopic substance in the pus of discarded surgical bandages.

As it resided in the nuclei of cells, he called it "nuclein". In 1919, Phoebus Levene identified the base, sugar and phosphate nucleotide unit. Levene suggested that DNA consisted of a string of nucleotide units linked together through the phosphate groups. However, Levene thought the chain was short and the bases repeated in a fixed order. In 1937 William Astbury produced the first X-ray diffraction patterns that showed that DNA had a regular structure.

In 1928, Frederick Griffith discovered that traits of the "smooth" form of the *Pneumococcus* could be transferred to the "rough" form of the same bacteria by mixing killed "smooth" bacteria with the live "rough" form. This system provided the first clear suggestion that DNA carried genetic information – the Avery-MacLeod-McCarty experiment – when Oswald Avery, along with coworkers Colin MacLeod and Maclyn McCarty, identified DNA as the transforming principle in 1943.

DNA's role in heredity was confirmed in 1952, when Alfred Hershey and Martha Chase in the Hershey-Chase experiment showed that DNA is the genetic material of the T2 phage.

In 1953 James D. Watson and Francis Crick suggested what is now accepted as the first correct double-helix model of DNA structure in the journal *Nature*. Their double-helix, molecular model of DNA was then based on a single X-ray diffraction image taken by Rosalind Franklin and Raymond Gosling in May 1952, as well as the information that the DNA bases were paired – also obtained through private communications from Erwin Chargaff in the previous years.

Experimental evidence supporting the Watson and Crick model were published in a series of five articles in the same issue of *Nature*. Of these, Franklin and Gosling's paper was the first publication of their own X-ray diffraction data and original analysis method that partially supported the Watson and Crick model; this issue also contained an article on DNA structure by Maurice Wilkins and two of his colleagues, whose analysis and *in vivo* B-DNA X-ray patterns also supported the presence *in vivo* of the double-helical DNA configurations as proposed by Crick and Watson for their double-helix molecular model of DNA in the previous two pages of *Nature*.

In 1962, after Franklin's death, Watson, Crick, and Wilkins jointly received the Nobel Prize in Physiology or Medicine. Unfortunately, Nobel rules of the time allowed only living recipients, but a vigorous debate continues on who should receive credit for the discovery. In an influential presentation in 1957, Crick laid out the "Central Dogma" of molecular biology, which foretold the relationship between DNA, RNA, and proteins, and articulated the "adaptor hypothesis".

Final confirmation of the replication mechanism that was implied by the double-helical structure followed in 1958 through the Meselson-Stahl experiment. Further work by Crick and coworkers showed that the genetic code was based on non-overlapping triplets of bases, called codons, allowing Har Gobind Khorana, Robert W. Holley and Marshall Warren Nirenberg to decipher the genetic code.

These findings represent the birth of molecular biology.

Exercise 1. Trace the history of DNA research.

Exercise 2.Translate the words and phrases into Russian drawing up sentences with them.

Mutations, DNA sequences, phylogeny, phylogenetics, ecological genetics, anthropology, criminal investigations, biological information, DNA nanotechnology, arrangement of molecules, original analysis method, findings, the birth of molecular biology, genetic code, double-helix, molecular model of DNA, genetic information, double-helix model of DNA structure, microscopic substance, a string of nucleotide units, DNA's role in heredity, to carry information, influential presentation, molecular biology, to articulate, replication mechanism, to decipher.

Exercise 3. Make up some dialogues from the information above.

Exercise 4. Write a small essay on the topic.

Exercise 5. Transfer the given information from the passages onto a table.

№	Activity			
	Who	When	Where	Score
1.				

Exercise 6. Describe the essentials of DNA nanotechnology.

DNA nanotechnology uses the unique molecular recognition properties of DNA and other nucleic acids to create self-assembling branched DNA complexes with useful properties. DNA is thus used as a structural material rather than as a carrier of biological information. This has led to the creation of two-dimensional periodic lattices (both tile-based as well as using the "DNA origami" method) as well as three-dimensional structures in the shapes of polyhedra. Nanomechanical devices and algorithmic self-assembly have also been demonstrated, and these DNA structures have been used to template the arrangement of other molecules such as gold nanoparticles and streptavidin proteins.

Exercise 7. Follow the history and anthropology of the pehomena.

Because DNA collects mutations over time, which are then inherited, it contains historical information and by comparing DNA sequences, geneticists can infer the evolutionary history of organisms, their phylogeny. This field of phylogenetics is a powerful tool in evolutionary biology.

If DNA sequences within a species are compared, population geneticists can learn the history of particular populations. This can be used in studies ranging from ecological genetics to anthropology; for example, DNA evidence is being used to try to identify the Ten Lost Tribes of Israel.

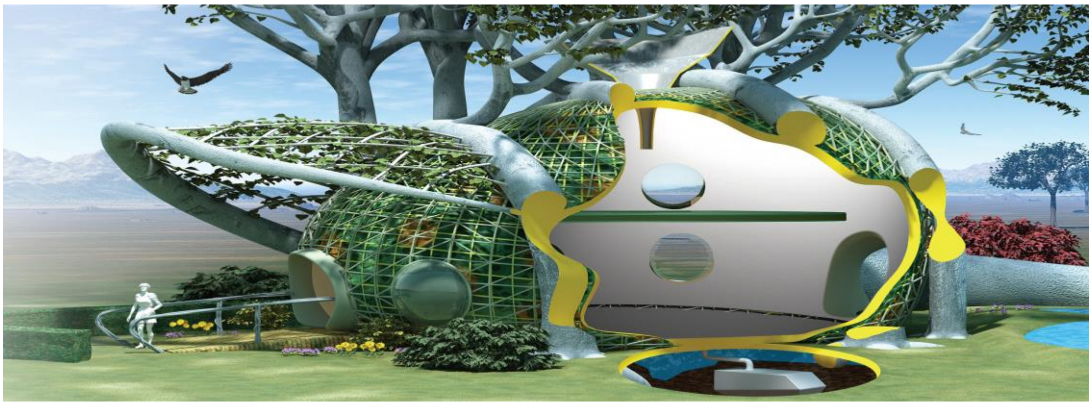
DNA has also been used to look at modern family relationships, such as establishing family relationships between the descendants of Sally Hemings and Thomas Jefferson.

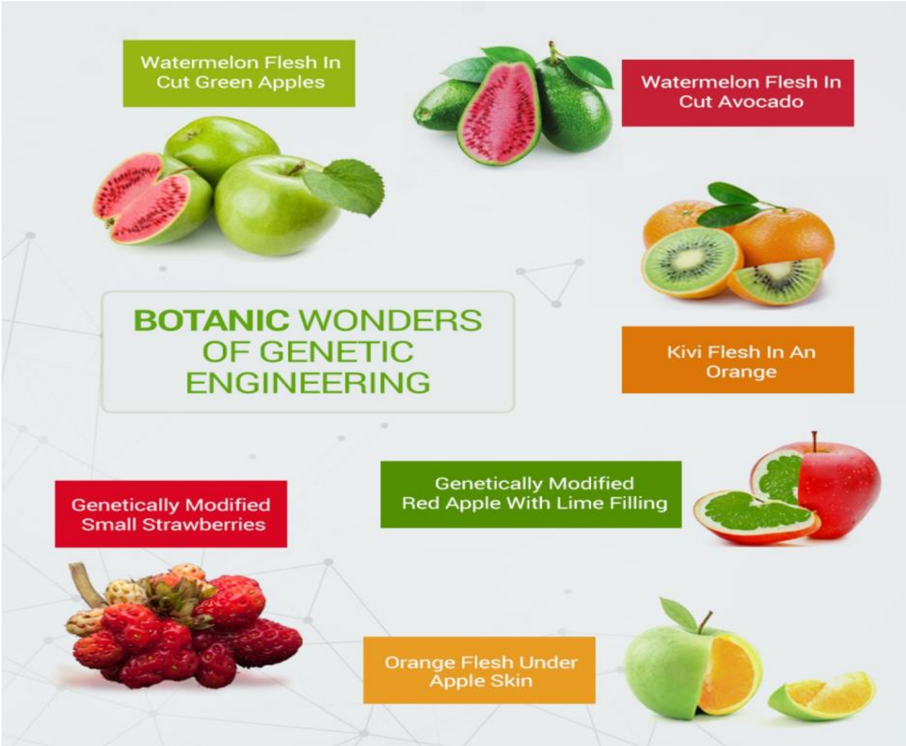
This usage is closely related to the use of DNA in criminal investigations detailed above. Indeed, some criminal investigations have been solved when DNA from crime scenes has matched relatives of the guilty individual.

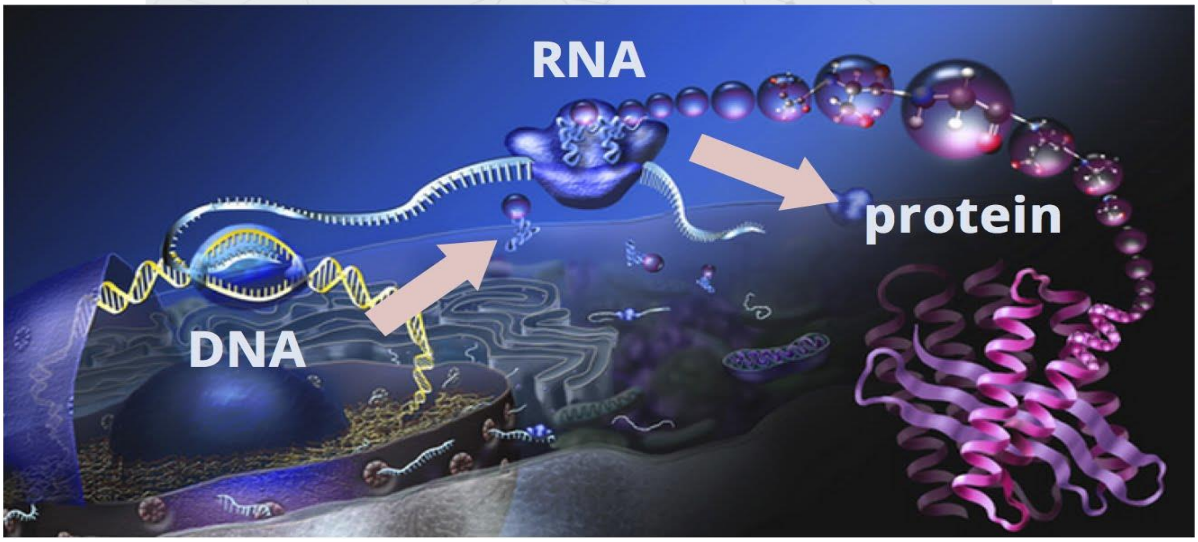
Exercise 8. Explain the notion.

DNA noun - deoxyribonucleic acid, a self-replicating material which is present in nearly all living organisms as the main constituent of chromosomes. It is the carrier of genetic information.

Each molecule of DNA consists of two strands coiled round each other to form a double helix, a structure like a spiral ladder. Each rung of the ladder consists of a pair of chemical groups called bases (of which there are four types), which combine in specific pairs so that the sequence on one strand of the double helix is complementary to that on the other: it is the specific sequence of bases which constitutes the genetic information. The fundamental and distinctive characteristics or qualities of someone or something, especially when regarded as unchangeable




Watermelon Flesh In Cut Green Apples
Watermelon Flesh In Cut Avocado
BOTANIC WONDERS OF GENETIC ENGINEERING
Kivi Flesh In An Orange
Genetically Modified Small Strawberries
Genetically Modified Red Apple With Lime Filling
Orange Flesh Under Apple Skin


RNA
protein
DNA

UNIT III. INFECTIOUS DISEASES

INTRODUCTION

Many infectious diseases that killed by the millions were greatly reduced in the 20th century, with one notable achievement being the eradication of smallpox, and considerable progress being made toward the eradication of polio (polio eradication being expected to be completed within the first decade of the 21st century) and Guinea Worm Disease.

Other diseases, such as diphtheria, typhoid fever, tuberculosis and whooping cough were greatly reduced throughout the world due to childhood immunization programs, improved sanitation, and the use of antibiotics. Malaria, even though easily treatable, is still a major killer in poor countries.

In the USA the death rate from pneumonia and influenza fell 93% in the 20th century; bronchitis was once responsible for 3% of deaths in America – that figure has fallen to nearly 0.1%.

Two major pandemics occurred in the 20th century: an outbreak of a severe strain of influenza (the Spanish Flu) which killed some 25 million or more people in 1918-1919, and the appearance of AIDS in the 1980s on. AIDS is transmitted by a virus, and viral diseases can usually only be overcome by vaccination. An effective AIDS vaccine has eluded researchers so far.

Anti-viral drugs have been developed, but they are too expensive for most people suffering from AIDS in highly affected areas, such as India and sub-saharan Africa. In addition to these major pandemics, there have been several minor pandemics resulting from different strains of the influenza virus: the Asian Flu of 1957 and the Hong Kong Flu of 1968 being the most notable. Currently, there is concern about the appearance of antibiotic-resistant strains of infectious organisms. It is believed that the overuse of antibiotics, including their use in Animal husbandry, contributes to this development.

Exercise 1. Describe achievements in Public Health, 1900-1999: Control of infectious diseases

Deaths from infectious diseases have declined markedly in the United States during the 20th century. This decline contributed to a sharp drop in infant and child mortality (1,2) and to the 29.2-year increase in life expectancy. In 1900, 30.4% of all deaths occurred among children aged less than 5 years; in 1997, that % age was only 1.4%. In 1900, the three leading causes of death were pneumonia, tuberculosis (TB), and diarrhea and enteritis, which (together with diphtheria) caused one third of all deaths. Of these deaths, 40% were among children aged less than 5 years. In 1997, heart disease and cancers accounted for 54.7% of all deaths, with 4.5% attributable to pneumonia, influenza, and human immunodeficiency virus (HIV) infection.

Despite this overall progress, one of the most devastating epidemics in human history occurred during the 20th century: the 1918 influenza pandemic that resulted in 20 million deaths, including 500,000 in the United States, in less than 1 year – more than have died in as short a time during any war or famine in the world. HIV infection, first recognized in 1981, has caused a pandemic that is still in progress, affecting 33 million people and causing an estimated 13.9 million deaths.

These episodes illustrate the volatility of infectious disease death rates and the unpredictability of disease emergence. Public health action to control infectious diseases in the 20th century is based on the 19th century discovery of microorganisms as the cause of many serious diseases.

Disease control resulted from improvements in sanitation and hygiene, the discovery of antibiotics, and the implementation of universal childhood vaccination programs.

Scientific and technologic advances played a major role in each of these areas and are the foundation for today's disease surveillance and control systems. Scientific findings have contributed to a new understanding of the evolving relation between humans and microbes.

***Exercise 2. Explain the stages of infectious diseases control with* sanitation & hygiene.**

The 19th century shift in population from country to city that accompanied industrialization and immigration led to overcrowding in poor housing served by inadequate or nonexistent public water supplies and waste-disposal systems. These conditions resulted in repeated outbreaks of cholera, dysentery, TB, typhoid fever, influenza, yellow fever, and malaria.

By 1900, however, the incidence of many of these diseases had begun to decline because of public health improvements, implementation of which continued into the 20th century. Local, state, and federal efforts to improve sanitation and hygiene reinforced the concept of collective "public health" action (e.g., to prevent infection by providing clean drinking water).

By 1900, 40 of the 45 states had established health departments. The first county health departments were established in 1908. From the 1930s through the 1950s, state and local health departments made substantial progress in disease prevention activities, including sewage disposal, water treatment, food safety, organized solid waste disposal, and public education about hygienic practices (e.g., foodhandling and handwashing).

Chlorination and other treatments of drinking water began in the early 1900s and became widespread public health practices, further decreasing the incidence of waterborne diseases.

The incidence of TB also declined as improvements in housing reduced crowding and TB-control programs were initiated. In 1900, 194 of every 100,000 U.S. residents died from TB; most were residents of urban areas. In 1940 (before the introduction of antibiotic therapy), TB remained a leading cause of death, but the crude death rate had decreased to 46 per 100,000 persons.

Animal and pest control also contributed to disease reduction. Nationally sponsored, state-coordinated vaccination and animal-control programs eliminated dog-to-dog transmission of rabies.

Malaria, once endemic throughout the southeastern United States, was reduced to negligible levels by the late 1940s; regional mosquito-control programs played an important role in these efforts.

Plague also diminished; the U.S. Marine Hospital Service (which later became the Public Health Service) led quarantine and ship inspection activities and rodent and vector-control operations.

The last major rat-associated outbreak of plague in the United States occurred during 1924-1925 in Los Angeles. This outbreak included the last identified instance of human-to-human transmission of plague in this country.

Exercise 3. Explain the score of notion «vaccination».

Strategic vaccination campaigns have virtually eliminated diseases that previously were common in the United States, including diphtheria, tetanus, poliomyelitis, smallpox, measles, mumps, rubella, and *Haemophilus influenzae* type b meningitis. With the licensure of the combined diphtheria and tetanus toxoids and pertussis vaccine in 1949, state and local health departments instituted vaccination programs, aimed primarily at poor children.

In 1955, the introduction of the Salk poliovirus vaccine led to federal funding of state and local childhood vaccination programs. In 1962, a federally coordinated vaccination program was established through the passage of the Vaccination Assistance Act--landmark legislation that has been renewed continuously and now supports the purchase and administration of a full range of childhood vaccines.

The success of vaccination programs in the United States and Europe inspired the 20th-century concept of "disease eradication" – the idea that a selected disease could be eradicated from all human populations through global cooperation.

In 1977, after a decade-long campaign involving 33 nations, smallpox was eradicated worldwide – approximately a decade after it had been eliminated from the United States and the rest of the Western Hemisphere. Polio and dracunculiasis may be eradicated by 2000.

Exercise 4. Choose the keywords that best convey the gist of the information.

Exercise 5. Add some in formation and make up a small report and give a talk in class.

Exercise 6. Characterize the role of antibiotics and other antimicrobial medicines.

Penicillin was developed into a widely available medical product that provided quick and complete treatment of previously incurable bacterial illnesses, with a wider range of targets and fewer side effects than sulfa drugs. Discovered fortuitously in 1928, penicillin was not developed for medical use until the 1940s, when it was produced in substantial quantities and used by the U.S. military to treat sick and wounded soldiers. Antibiotics have been in civilian use for 57 years and have saved the lives of persons with streptococcal and staphylococcal infections, gonorrhea, syphilis, and other infections. Drugs also have been developed to treat viral diseases (herpes and HIV infection); fungal diseases (e.g., candidiasis and histoplasmosis); and parasitic diseases (e.g., malaria).

The microbiologist Selman Waksman led much of the early research in discovering antibiotics.

However, the emergence of drug resistance in many organisms is reversing some of the therapeutic miracles of the last 50 years and underscores the importance of disease prevention.

Exercise 7. Define technologic advances in detecting and monitoring infectious diseases.

Technologic changes that increased capacity for detecting, diagnosing, and monitoring infectious diseases included development early in the century of serologic testing and more recently the development of molecular assays based on nucleic acid and antibody probes. The use of computers and electronic forms of communication enhanced the ability to gather, analyze, and disseminate disease surveillance data.

Exercise 8. Expound the essentials of serologic testing.

Serologic testing came into use in the 1910s and has become a basic tool to diagnose and control many infectious diseases. Syphilis and gonorrhea, for example, were widespread early in the century and were difficult to diagnose, especially during the latent stages.

The advent of serologic testing for syphilis helped provide a more accurate description of this public health problem and facilitated diagnosis of infection. For example, in New York City, serologic testing in 1901 indicated that 5% -19% of all men had syphilitic infections.

The first virus isolation techniques came into use at the turn of the century. They involved straining infected material through successively smaller sieves and inoculating test animals or plants to show the purified substance retained disease-causing activity. The first "filtered" viruses were tobacco mosaic virus (1882) and foot-and-mouth disease virus of cattle (1898). The U.S. Army Command under Walter Reed filtered yellow fever virus in 1900. The subsequent development of cell culture in the 1930s paved the way for large-scale production of live or heat-killed viral vaccines.

Negative staining techniques for visualizing viruses under the electron microscope were available by the early 1960s. During the last quarter of the 20th century, molecular biology has provided powerful new tools to detect and characterize infectious pathogens. The use of nucleic acid hybridization and sequencing techniques has made it possible to characterize the causative agents of previously unknown diseases (hepatitis C, human ehrlichiosis, hantavirus pulmonary syndrome, acquired immunodeficiency syndrome [AIDS], and Nipah virus disease).

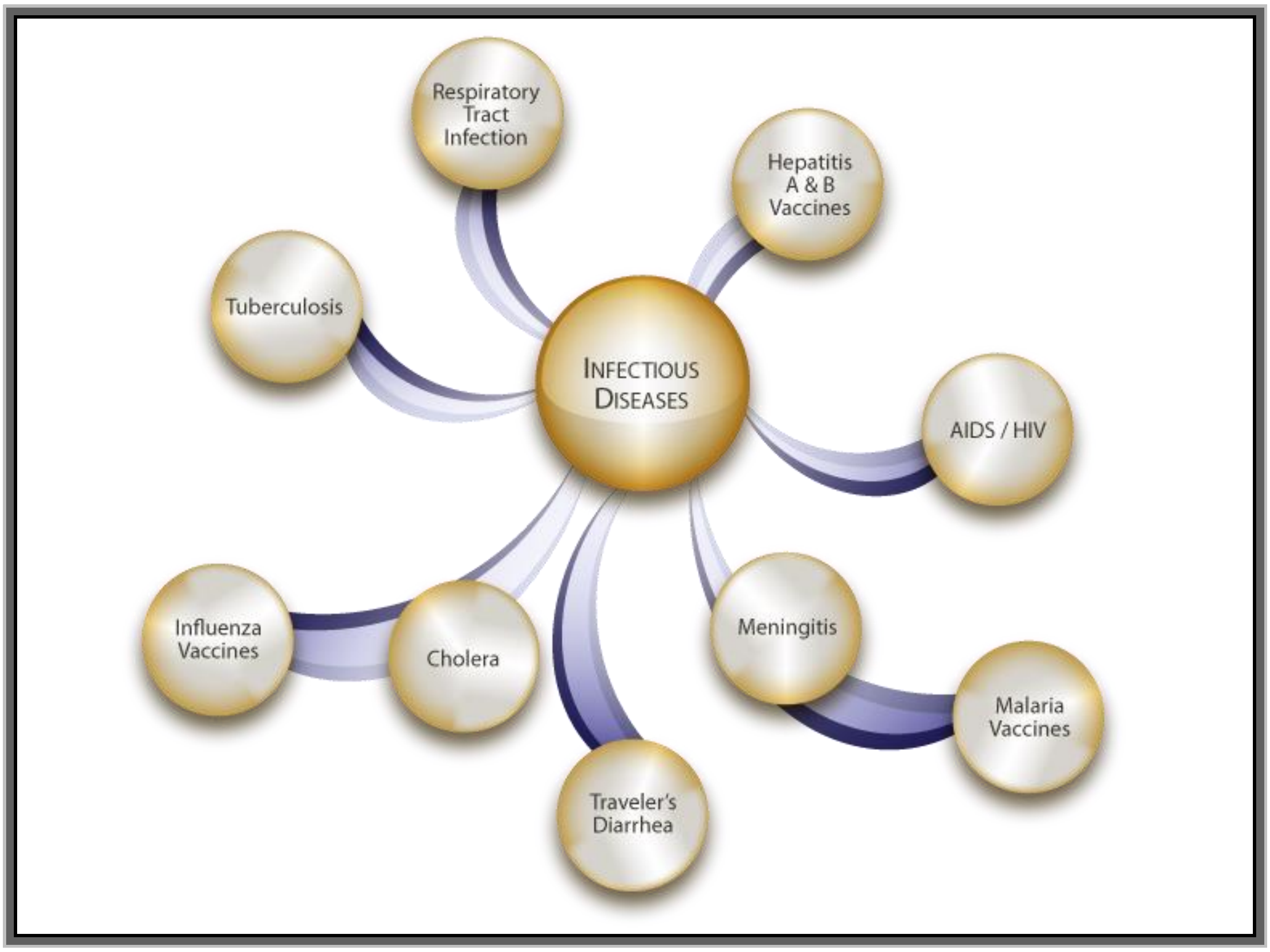
Molecular tools have enhanced capacity to track the transmission of new threats and find new ways to prevent and treat them. Had AIDS emerged 100 years ago, when laboratory-based diagnostic methods were in their infancy, the disease might have remained a mysterious syndrome for many decades. Moreover, the drugs used to treat HIV-infected persons and prevent perinatal transmission (e.g., replication analogs and protease inhibitors) were developed based on a modern understanding of retroviral replication at the molecular level.

Exercise 9. Make up some dialogues from the information above.

Exercise 10. Render the main idea of the information.

Exercise 11. Add some information & make up a small report and give a talk in class.

Exercise 12. Read the information & pick up the essential details in the form of quick notes.



Exercise 13. Try to understand the story on life and work of S. A. Waksman, Ph.D.

In 1943, Selman Abraham Waksman (July 22, 1888-August 16, 1973) led a team of Rutgers University researchers that isolated streptomycin, the first antibioticeffective against tuberculosis (TB) in humans. In 1952, Waksman received the Nobel Prize for this discovery.

Waksman grew up in the small Russian village of Novaya Priluka. In 1910, he settled in New Jersey, where a cousin operated a small farm. An interest in scientific farming brought him to nearby Rutgers College of Agriculture, where he earned a bachelor's degree in science in 1915 and a master's degree a year later. He completed his doctorate at the University of California, Berkeley, in 2 years, and returned to Rutgers to take a position as lecturer in soil microbiology. Waksman preferred the term "microbiology" to the conventional "bacteriology" because "not the bacteria but the fungi and the actinomycetes formed my major interests among the microorganisms".

By the 1930s, he was a leading figure in microbiology, attracting talented graduate students, including Rene, Dubos, whose work led to the discovery in 1939 of gramicidin, the first clinically useful topical antibiotic. Dubos' success and the introduction of penicillin prompted Waksman to put his graduate students and assistants to work looking for antibiotics.

In 1943, a Waksman student, Albert Schatz, isolated streptomycin. In 1944, clinical trials demonstrated the drug's effectiveness against gram-negative bacteria. Despite substantial problems with toxicity and drug resistance, streptomycin soon formed the foundation of multidrug therapies for TB. With the introduction and use of antibiotics, mortality of TB was reduced drastically.

In the USA, from 1945 to 1955, TB mortality decreased from 39.9 deaths per 100,000 population to 9.1. Around the world, TB remained a substantial health problem, but until the emergence of multidrug-resistant TB, many shared Waksman's optimism, expressed in 1964, that "the final chapter of the battle against tuberculosis appears to be athand".

Exercise 14. Give the main idea of the story on the first American civilian saved by penicillin.

The first U.S. civilian whose life was saved by penicillin died in June 1999 at the age of 90 years. In March 1942, a 33-year-old woman was hospitalized for a month with a life-threatening streptococcal infection at a New Haven, Connecticut, hospital. She was delirious, and her temperature reached almost 107 F (41.6 C). Treatments with sulfa drugs, blood transfusions, and surgery had no effect. As a last resort, her doctors injected her with a tiny amount of an obscure experimental drug called penicillin. Her hospital chart, now at the Smithsonian Institution, indicates a sharp overnight drop in temperature; by the next day she was no longer delirious. She survived to marry, raise a family, and meet Sir Alexander Fleming, the scientist who discovered penicillin.

In 1945, Fleming was awarded the Nobel Prize in Physiology and Medicine, along with Ernst Chain and Howard Florey, who helped develop penicillin into a widely available medical product.

Exercise 15. Describe new modes of disease transmissions by 20th-century technology.

The bacteria that cause legionnaires disease have been spread through modern ventilation systems. Human immunodeficiency virus and hepatitis C virus have been spread through transfusions of unscreened blood. Foodborne diseases, such as salmonellosis have been spread on centrally processed foods distributed simultaneously to many states or countries. Airplanes have replaced ships as major vehicles of international disease spread. More people are traveling to tropical rain forests and other wilderness habitat that are reservoirs for insects and animals that harbor unknown infectious agents. This incursion is due to economic development and an expanded tourist trade that caters to persons who wish to visit undeveloped areas.

In the USA, increasing suburbanization and the reversion of agricultural land to secondary growth forest has brought people into contact with deer that carry ticks infected with the causative agent of Lyme disease, and has brought household pets into contact with rabies-infected raccoons.

The increased development and use of antimicrobial agents has hastened the development of drug resistance. People whose immunologic and other host defenses have been impaired by modern medical treatments (e.g., bone marrow or solid organ transplants, chemotherapy, chronic corticosteroid therapy, renal dialysis, or indwelling medical devices) are more likely to acquire opportunistic infections.

CHALLENGES FOR THE 21ST CENTURY

Success in reducing morbidity and mortality from infectious diseases during the first three quarters of the 20th century led to complacency about the need for continued research into treatment and control of infectious microbes.

However, the appearance of AIDS, the re-emergence of TB (including multidrug-resistant strains), and an overall increase in infectious disease mortality during the 1980s and early 1990s provide additional evidence that as long as microbes can evolve, new diseases will appear.

The emergence of new diseases underscores the importance of disease prevention through continual monitoring of underlying factors that may encourage the emergence or re-emergence of diseases. Molecular genetics has provided a new appreciation of the remarkable ability of microbes to evolve, adapt, and develop drug resistance in an unpredictable and dynamic fashion. Resistance genes are transmitted from one bacterium to another on plasmids, and viruses evolve through replication errors and reassortment of gene segments and by jumping species barriers.

Recent examples of microbial evolution include the emergence of a virulent strain of avian influenza in Hong Kong (1997-98); the multidrug-resistant W strain of *M. tuberculosis* in the USA in 1991; and *Staphylococcus aureus* with reduced susceptibility to vancomycin in Japan in 1996 and the United States in 1997. For continued success in controlling infectious diseases, the U.S. public health system must prepare to address diverse challenges, including the emergence of new infectious diseases, the re-emergence of old diseases (sometimes in drug-resistant forms), large foodborne outbreaks, and acts of bioterrorism.

Ongoing research on the possible role of infectious agents in causing or intensifying certain chronic diseases (including diabetes mellitus type 1, some cancers, and heart conditions also is imperative. Continued protection of health requires improved capacity for disease surveillance and outbreak response at the local, state, federal, and global levels; the development and dissemination of new laboratory and epidemiologic methods; continued antimicrobial and vaccine development; and ongoing research into environmental factors that facilitate disease emergence.

20th-century sees dramatic drop in infectious diseases and great strides in the control of communicable diseases. The average American is now expected to live an average of 29 years longer than in 1900. At the turn of the century, over 30 % of all deaths were among children less than five years old.

In 2007, that figure dropped to around 1.4 %. In the beginning of this century, tuberculosis, pneumonia and diarrhea were the leading causes of death. In 2007, heart disease and cancer accounted for the majority of deaths, and these were mostly among the elderly.

According to the report, improved sanitary conditions, water purification, hygiene, and the discovery of antibiotics are together responsible for the dramatic drop in infectious diseases. However, the report states that despite the breakthroughs in most areas, this century has also seen "one of the most devastating epidemics in human history... the 1918 influenza pandemic."

The epidemic claimed 20 million lives worldwide, and half a million in the USA. The report also stated that some diseases cannot be foreseen. It sites the outbreak if HIV as an example. HIV has infected over 33 million people around the world, and claimed around 14 million lives.

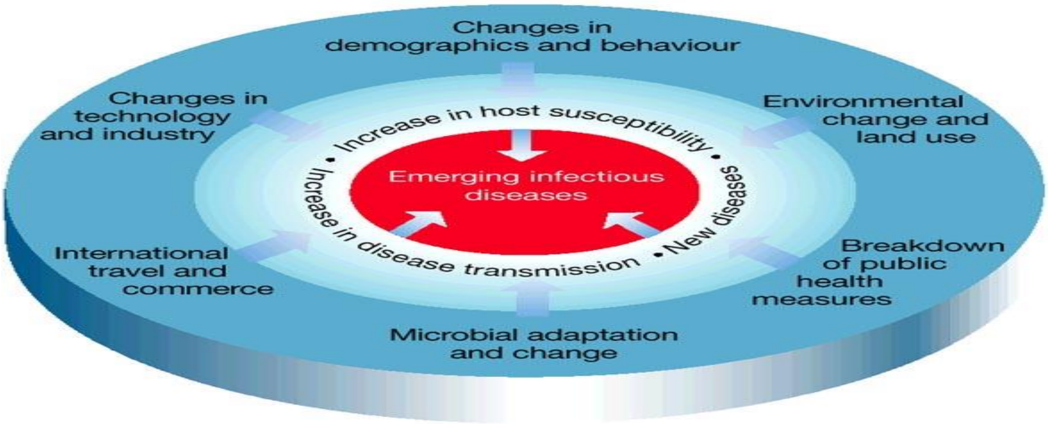
The report warns that US public health system must be vigilant and that "the emergence of new diseases underscores the importance of disease prevention through continual monitoring of underlying factors that may encourage (such) emergence or re-emergence."

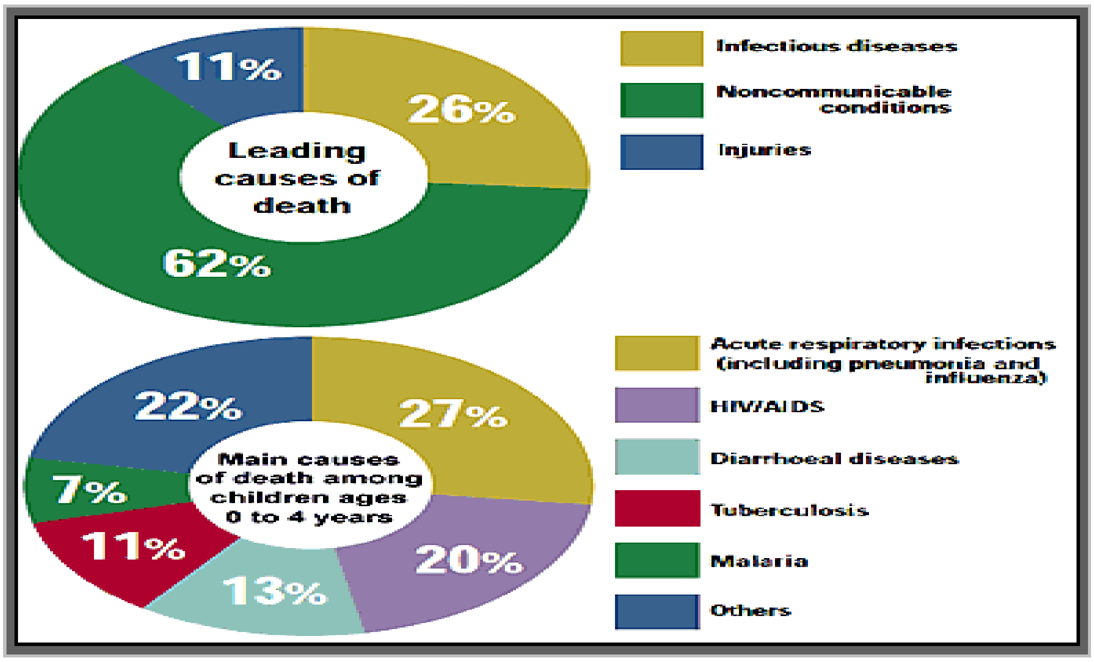
Exercise 1. Desribe challenges for the 21st century.

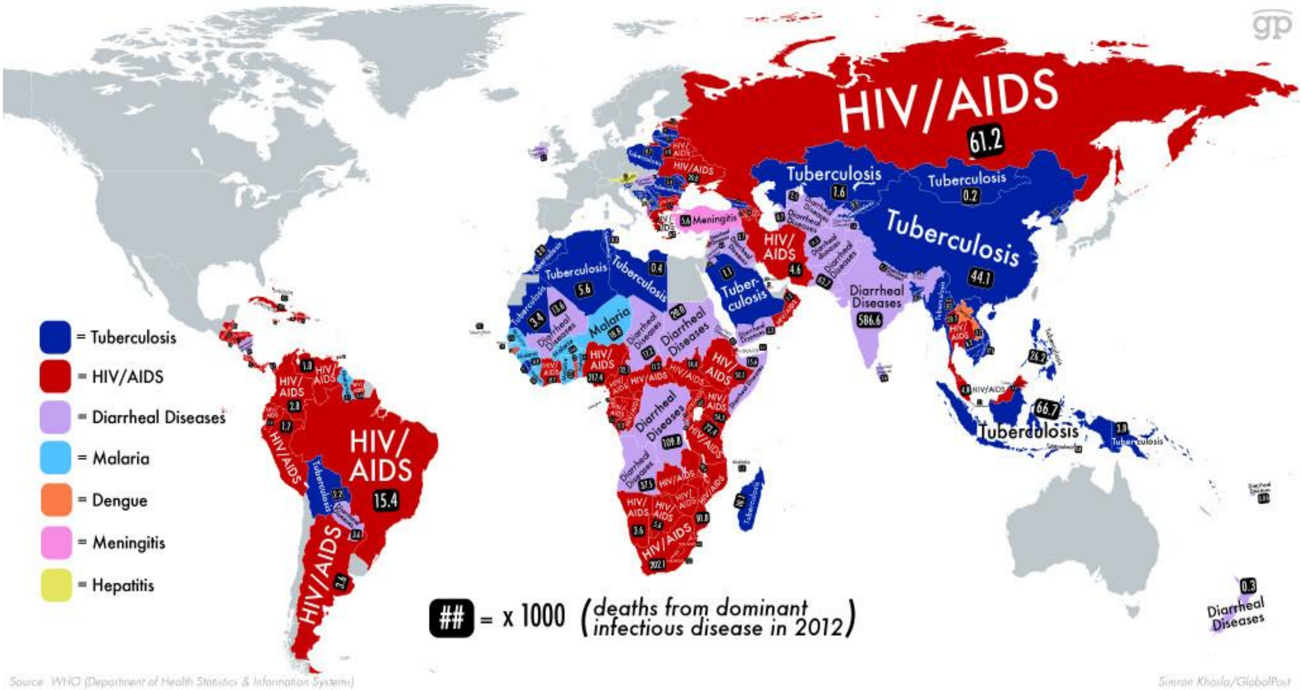
Exercise 2. Make up some dialogues from the information above.

Exercise 3. Add some in formation and make up a small report and give a talk in class.

Exercise 4. Add some information & make up a small report and give a talk in class.


Changes in demographics and behaviour
Changes in technology and industry
Environmental change and land use
Increase in host susceptibility
Emerging infectious diseases
Increase in disease transmission
New diseases
International travel and commerce
Breakdown of public health measures
Microbial adaptation and change


11%
26%
Leading causes of death
62%
Infectious diseases
Noncommunicable conditions
Injuries
22%
27%
7%
Main causes of death among children ages 0 to 4 years
11%
20%
13%
Acute respiratory infections (including pneumonia and influenza)
HIV/AIDS
Diarrhoeal diseases
Tuberculosis
Malaria
Others


gp
HIV/AIDS
61.2
Tuberculosis
44.1
Diarrheal Diseases
586.6
Tuberculosis
66.7
HIV/AIDS
15.4
= Tuberculosis
= HIV/AIDS
= Diarrheal Diseases
= Malaria
= Dengue
= Meningitis
= Hepatitis
= x 1000 (deaths from dominant infectious disease in 2012)
Source: WHO (Department of Health Statistics & Information Systems)
Simran Khosla/GlobalPost

EPIDEMIC

In epidemiology, an **epidemic** (from Greek *epi-* upon + *demos* people) occurs when new cases of a certain disease, in a given human population, and during a given period, substantially exceed what is "expected," based on recent experience (the number of new cases in the population during a specified period of time is called the "incidence rate").

(An epizootic is the analogous circumstance within an animal population.) In recent usages, the disease is not required to be communicable; examples include cancer or heart disease. Another example includes the infamous Black Plague of the Middle Ages.

Classification

Defining an epidemic can be subjective, depending in part on what is "expected". An epidemic may be restricted to one locale (an outbreak), more general (an "epidemic") or even global (pandemic). Because it is based on what is "expected" or thought normal, a few cases of a very rare disease may be classified as an "epidemic," while many cases of a common disease (common cold) would not.

Endemic diseases

Common diseases that occur at a constant but relatively low rate in the population are said to be "endemic." An example of an endemic disease is malaria in some parts of Africa (Liberia) in which a large portion of the population is expected to get malaria at some point in their lifetime. Another is the bubonic plague or "Black Death" that swept through Europe in the 1340s, killing millions.

Syndemics

The term "syndemic" refers to interacting epidemics that increase the health burden of affected populations. Social conditions that heighten the health risk of populations (e.g. poverty, discrimination and stigmatization, and marginalization) by increasing stress, malnutrition, interpersonal violence, and the experience of deprivation, increase the clustering of epidemic diseases and the likelihood of their interacting.

Non-infectious disease usage

The term "epidemic" is often used in a sense to refer to widespread and growing societal problems, for example, in discussions of obesity or drug addiction. It can also be used metaphorically to relate a type of problem like those mentioned above.

Factors stimulating new epidemics

Alterations in agricultural practices and land useage

- Changes in society and human demographics
- Poor population health (e.g., malnutrition, high prevalence of HIV)
- Hospitals and medical procedures
- Evolution of the pathogen (e.g., increased virulence, drug resistance)
- Contamination of water supplies and food sources
- International travel
- Failure of public health programs
- International trade
- Climate change

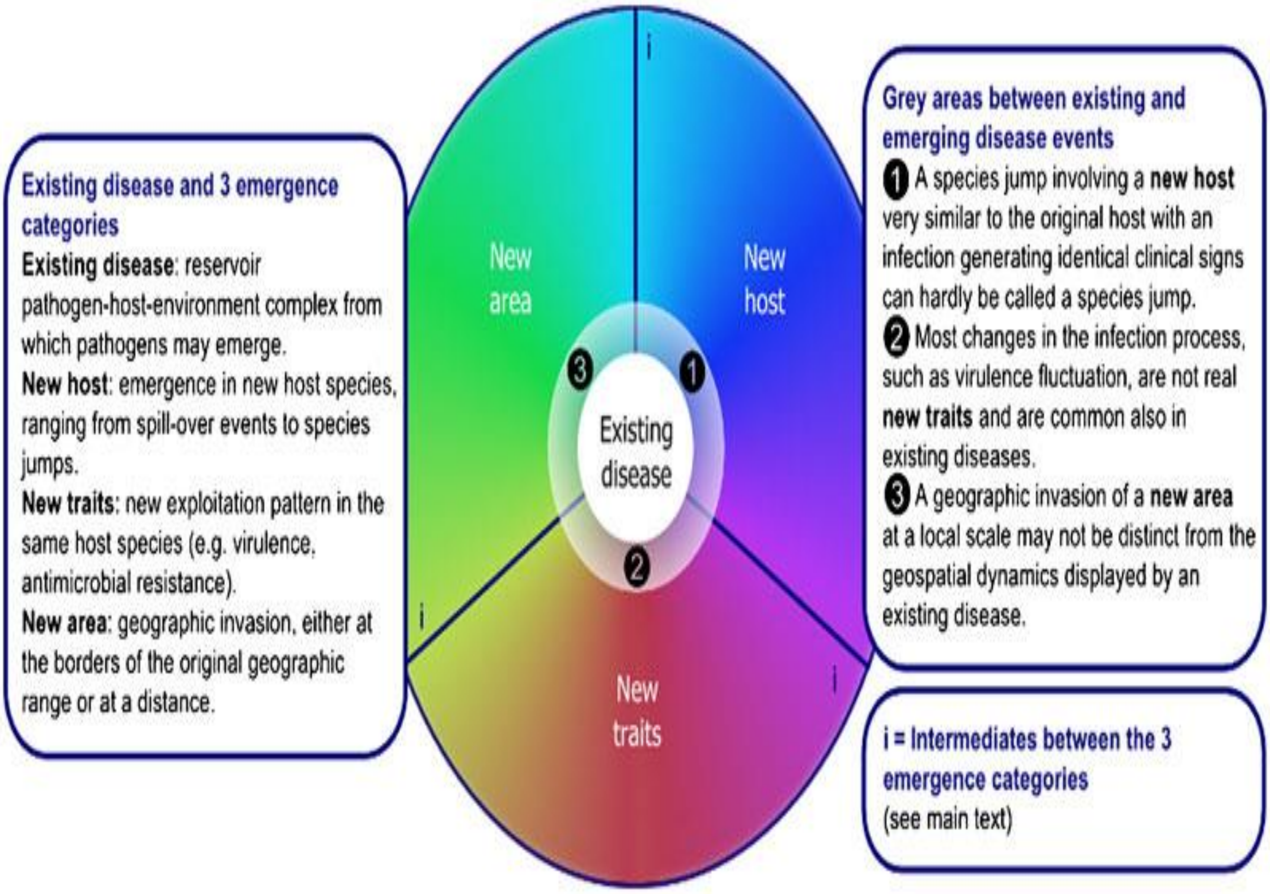
Several other factors have also been mentioned in different reports, such as the report by professor Andy Dobson and the report by professor Akilesh Mishra.These include : reduced levels of biodiversity (e.g. through environmental destruction) and bad urban planning.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Add some information & make up a small report and give a talk in class.

Exercise 3. Read the information & pick up the essential details in the form of quick notes.


Legionellosis
E. coli 0157
Lassa fever
E. coli 0157
West Nile virus
North America
980,000
West Nile virus
Lyme disease
Western Europe
570,000
Lyme disease
Eastern Europe/Central Asia
1,200,000
East Asia and Pacific
1,200,000
North Africa/Middle East
550,000
South/Southeast Asia
6,000,000
E. coli 0157
Caribbean
440,000
Hantavirus
SARS
Dengue virus
Dengue virus
Avian influenza
Cholera
West Nile virus
Ebola
Sub-saharan Africa
29,400,000
Drug-resistant malaria
Latin America
1,500,000
Australia/New Zealand
15,000
Legionellosis
Ebola
Drug-resistant malaria


Existing disease and 3 emergence categories
Existing disease: reservoir pathogen-host-environment complex from which pathogens may emerge.
New host: emergence in new host species, ranging from spill-over events to species jumps.
New traits: new exploitation pattern in the same host species (e.g. virulence, antimicrobial resistance).
New area: geographic invasion, either at the borders of the original geographic range or at a distance.
New area
New host
New traits
Existing disease
1
2
3
i
i
i
Grey areas between existing and emerging disease events
1 A species jump involving a new host very similar to the original host with an infection generating identical clinical signs can hardly be called a species jump.
2 Most changes in the infection process, such as virulence fluctuation, are not real new traits and are common also in existing diseases.
3 A geographic invasion of a new area at a local scale may not be distinct from the geospatial dynamics displayed by an existing disease.
i = Intermediates between the 3 emergence categories
(see main text)

PANDEMIC

A **pandemic** is an epidemic of infectious disease that is spreading through human populations across a large region; for instance a continent, or even worldwide. A widespread endemic disease that is stable in terms of how many people are getting sick from it is not a pandemic. Further, flu pandemics exclude seasonal flu. Throughout history there have been a number of pandemics, such as smallpox and tuberculosis. More recent pandemics include the HIV pandemic and the 2009 flu pandemic.

Definition & stages

According to the World Health Organization, a pandemic can start when three conditions have been met:

- emergence of a disease new to a population;
- agents infect humans, causing serious illness; and
- agents spread easily and sustainably among humans.

A disease or condition is not a pandemic merely because it is widespread or kills many people; it must also be infectious. For instance, cancer is responsible for many deaths but is not considered a pandemic because the disease is not infectious or contagious.

In a virtual press conference in May 2009 on the influenza pandemic Dr. Keiji Fukuda, Assistant Director-General and Interim for Health Security and Environment, WHO said "An easy way to think about pandemic ... is to say: a pandemic is a global outbreak. Then you might ask yourself: "What is a global outbreak"? Global outbreak means that we see both spread of the agent ... and then we see disease activities in addition to the spread of the virus."

In planning for a possible influenza pandemic the WHO published a document on pandemic preparedness guidance in1999, revised in 2005 and during the 2009 outbreak, defining phases and appropriate actions for each phase in an aide memoire entitled WHO pandemic phase descriptions and main actions by phase. All versions of this document refer to influenza. The phases are defined by the spread of the disease; virulence and mortality are not mentioned.

CURRENT PANDEMICS

2009 influenza A/H1N1

The 2009 outbreak of a new strain of Influenza A virus subtype H1N1 created concerns that a new pandemic was occurring. In the latter half of April, 2009, the World Health Organization's pandemic alert level was sequentially increased from three to five that the pandemic level had been raised to its highest level, level six. This was the first pandemic on this level since 1968. The H1N1 strain was indeed a pandemic, having nearly 30,000 confirmed cases worldwide.

HIV went directly from Africa to Haiti, then spread to the United States and much of the rest of the world beginning around 1969. HIV, the virus that causes AIDS, is currently a pandemic, with infection rates as high as 25% in southern and eastern Africa. In 2006 the HIV prevalence rate among pregnant women in South Africa was 29.1%. Effective education about safer sexual practices and bloodborne infection precautions training have helped to slow down infection rates in several African countries sponsoring national education programs. Infection rates are rising again in Asia and the Americas. AIDS could kill 31 mln. people in India and 18 million in China by 2025, according to projections by U.N. population researchers. AIDS death toll in Africa may reach 90-100 mln. by 2025.

Exercise 1. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

HISTORY OF EPIDEMICS

There have been a number of significant pandemics recorded in human history, generally zoonoses which came about with domestication of animals, such as influenza and tuberculosis.

There have been a number of particularly significant epidemics that deserve mention above the "mere" destruction of cities:

- Plague of Athens, 430 BC. Typhoid fever killed a quarter of the Athenian troops, and a quarter of the population over four years. This disease fatally weakened the dominance of Athens, but the sheer virulence of the disease prevented its wider spread; i.e. it killed off its hosts at a rate faster than they could spread it.

The exact cause of the plague was unknown for many years. In January 2006, researchers from the University of Athens analyzed teeth recovered from a mass grave underneath the city, and confirmed the presence of bacteria responsible for typhoid.

- Antonine Plague, 165–180. Possibly smallpox brought to the Italian peninsula by soldiers returning from the Near East; it killed a quarter of those infected, and up to five million in all. At the height of a second outbreak, the Plague of Cyprian (251–266), which may have been the same disease, 5,000 people a day were said to be dying in Rome.
- Plague of Justinian, from 541 to 750, was the first recorded outbreak of the bubonic plague. It started in Egypt, and reached Constantinople the following spring, killing (according to the Byzantine chronicler Procopius) 10,000 a day at its height, and perhaps 40% of the city's inhabitants. The plague went on to eliminate a quarter to a half of the human population that it struck throughout the known world. It caused Europe's population to drop by around 50% between 550 and 700.
- Black Death, started 1300s. The total number of deaths worldwide is estimated at 75 million people. Eight hundred years after the last outbreak, the plague returned to Europe. Starting in Asia, the disease reached Mediterranean and western Europe in 1348 (possibly from Italian merchants fleeing fighting in the Crimea), and killed an estimated 20 to 30 million Europeans in six years; a third of the total population, and up to a half in the worst-affected urban areas.

It was the first of a cycle of European plague epidemics that continued until the 18th century. During this period, more than 100 plague epidemics swept across Europe.

In England, for example, epidemics would continue in 2- to 5-year cycles from 1361 to 1480. By the 1370s, England's population was reduced by 50%. The Great Plague of London of 1665-66 was the last major outbreak of the plague in England. The disease killed an estimated 100,000 people, 20% of London's population.

- Third Pandemic, started in China in the middle of the 19th century, spreading plague to all inhabited continents and killing 10 million people in India alone. During this pandemic, the United States saw its first case of plague in 1900 in San Francisco. Today, isolated cases of plague are still found in the western USA.

Encounters between European explorers and populations in the rest of the world often introduced local epidemics of extraordinary virulence. Disease killed the entire native (Guanches) population of the Canary Islands in the 16th century. Half the native population of Hispaniola in 1518 was killed by smallpox. Smallpox also ravaged Mexico in the 1520s, killing 150,000 in Tenochtitlán alone, including the emperor, and Peru in the 1530s, aiding the European conquerors.

Historically, measles was very prevalent throughout the world, as it is highly contagious. According to the National Immunization Program, 90% of people were infected with measles by age 15. Before the vaccine was introduced in 1963, there were an estimated 3-4 million cases in the U.S. each year. In roughly the last 150 years, measles has been estimated to have killed about 200 million people worldwide.

In 2000 alone, measles killed some 777,000 worldwide. There were some 40 million cases of measles globally that year.

Measles is an endemic disease, meaning that it has been continually present in a community, and many people develop resistance. In populations that have not been exposed to measles, exposure to a new disease can be devastating.

In 1529, a measles outbreak in Cuba killed two-thirds of the natives who had previously survived smallpox. The disease had ravaged Mexico, Central America, and the Inca civilization. Measles killed a further two million Mexican natives in the 1600s. In 1618-1619, smallpox wiped out 90% of the Massachusetts Bay Native Americans. During the 1770s, smallpox killed at least 30% of the Pacific Northwest Native Americans.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Explain the score of smallpox epidemics.

Smallpox is a highly contagious disease caused by the Variola virus. The disease killed an estimated 400,000 Europeans per year during the closing years of the 18th century. During the 20th century, it is estimated that smallpox was responsible for 300-500 million deaths.

As recently as early 1950s an estimated 50 million cases of smallpox occurred in the world each year. After successful vaccination campaigns throughout the 19th and 20th centuries, the WHO certified the eradication of smallpox in December 1979. To this day, smallpox is the only human infectious disease to have been completely eradicated. Smallpox epidemics in 1780-1782 and 1837-1838 brought devastation and drastic depopulation among the Plains Indians. Some believe that the death of up to 95% of the Native American population of the New World was caused by Old World diseases such as smallpox, measles, and influenza.

Over the centuries, the Europeans had developed high degrees of immunity to these diseases, while the indigenous peoples had no such immunity. Smallpox devastated the native population of Australia, killing around 50% of Indigenous Australians in the early years of British colonisation. It also killed many New Zealand Māori. As late as 1848-49, as many as 40,000 out of 150,000 Hawaiians are estimated to have died of measles, whooping cough and influenza.

Introduced diseases, notably smallpox, nearly wiped out the native population of Easter Island. In 1875, measles killed over 40,000 Fijians, approximately one-third of the population. The disease decimated the Andamanese population. Ainu population decreased drastically in the 19th century, due in large part to infectious diseases brought by Japanese settlers pouring into Hokkaido.

Disease killed more British soldiers in India than war. Between 1736 and 1834 only some 10% of East India Company's officers survived to take the final voyage home. As early as 1803, the Spanish Crown organized a mission (the Balmis expedition) to transport the smallpox vaccine to the Spanish colonies, and establish mass vaccination programs there. By 1832, the federal government of the United States established a smallpox vaccination program for Native Americans.

From the beginning of the 20th century onwards, the elimination or control of disease in tropical countries became a driving force for all colonial powers.

Exercise 3. Summarize the information briefly in English.

TYPES OF EPIDEMIC

Syphilis

Researchers concluded that syphilis was carried from the New World to Europe after Columbus' voyages. The findings suggested Europeans could have carried the nonvenereal tropical bacteria home, where the organisms may have mutated into a more deadly form in the different conditions of Europe.

The disease was more frequently fatal than it is today. Syphilis was a major killer in Europe during the Renaissance. Between 1602 and 1796, the Dutch East India Company sent almost a million Europeans to work in the Asia. Ultimately, only less than one-third made their way back to Europe.

The majority died of diseases. The sleeping sickness epidemic in Africa was arrested due to mobile teams systematically screening millions of people at risk. In the 20th century, the world saw the biggest increase in its population in human history due to lessening of the mortality rate in many countries due to medical advances. The world population has grown from 1.6 billion in 1900 to an estimated 6.7 billion today.

Cholera pandemic

- First cholera pandemic 1816-1826. Previously restricted to the Indian subcontinent, the pandemic began in Bengal, then spread across India by 1820. 10,000 British troops and countless Indians died during this pandemic. It extended as far as China, Indonesia (where more than 100,000 people succumbed on the island of Java alone) and the Caspian Sea before receding. Deaths in India between 1817 and 1860 are estimated to have exceeded 15 million persons. Another 23 million died between 1865 and 1917. Russian deaths during a similar time period exceeded 2 million.
- Second cholera pandemic 1829-1851. Reached Russia, Hungary (about 100,000 deaths) and Germany in 1831, London in 1832 (more than 55,000 persons died in the United Kingdom), France, Canada (Ontario), and USA (New York) in the same year, and the Pacific coast of North America by 1834.

A two-year outbreak began in England and Wales in 1848 and claimed 52,000 lives. It is believed that over 150,000 Americans died of cholera between 1832 and 1849.

- Third pandemic 1852-1860. Mainly affected Russia, with over a million deaths. In 1852, cholera spread east to Indonesia and later invaded China and Japan in 1854. The Philippines were infected in 1858 and Korea in 1859. In 1859, an outbreak in Bengal once again led to the transmission of the disease to Iran, Iraq, Arabia and Russia.
- Fourth pandemic 1863-1875. Spread mostly in Europe and Africa. At least 30,000 of the 90,000 Mecca pilgrims fell victim to the disease. Cholera claimed 90,000 lives in Russia in 1866.
- In 1866, there was an outbreak in North America. It killed some 50,000 Americans.
- Fifth pandemic 1881-1896. The 1883-1887 epidemic cost 250,000 lives in Europe and at least 50,000 in Americas. Cholera claimed 267,890 lives in Russia (1892); 120,000 in Spain; 90,000 in Japan and 60,000 in Persia.
- In 1892, cholera contaminated the water supply of Hamburg, and caused 8606 deaths.
- Sixth pandemic 1899-1923. Had little effect in Europe because of advances in public health, but Russia was badly affected again (more than 500,000 people dying of cholera during the first quarter of the 20th century). The sixth pandemic killed more than 800,000 in India.
- The 1902-1904 cholera epidemic claimed over 200,000 lives in the Philippines. 27 epidemics were recorded during pilgrimages to Mecca from the 19th century to 1930, and more than 20,000 pilgrims died of cholera during the 1907-08 hajj.
- Seventh pandemic 1962-66 began in Indonesia, called El Tor after the strain, and reached Bangladesh in 1963, India in 1964, and the USSR in 1966.

Influenza

The Greek physician Hippocrates first described influenza in 412 B.C.

- The first influenza pandemic was recorded in 1580 and since then influenza pandemics occurred every 10 to 30 years.
- Influenza pandemics in 1729-1730, 1732-1733, 1781-1782, 1830, 1833-1834, 1847-1848.
- The "Asiatic Flu", 1889–1890, was first reported in May 1889 in Bukhara, Uzbekistan. By October, it had reached Tomsk and the Caucasus. It rapidly spread west and hit North America in December 1889, South America in February-April 1890, India in February-March 1890, and Australia in March-April 1890. It was purportedly caused by the H2N8 type of flu virus. It had a very high attack and mortality rate. About 1 million people died in this pandemic."
- The "Spanish flu", 1918–1919. First identified early in March 1918 in US troops training at Camp Funston, Kansas. By October 1918, it had spread to become a world-wide pandemic on all continents, and eventually infected an estimated one third of the world's population (or ≈500 million persons). Unusually deadly and virulent, it ended nearly as quickly as it began, vanishing completely within 18 months. In six months, some 50 million were dead; some estimates put the total of those killed worldwide at over twice that number. An estimated 17 million died in India, 675,000 in the United States and 200,000 in the UK.

The virus was recently reconstructed by scientists at the CDC studying remains preserved by the Alaskan permafrost. They identified it as a type of H1N1 virus.

- The "Asian Flu", 1957-58. An H2N2 virus caused about 70,000 deaths in the United States. First identified in China in late February 1957, the Asian flu spread to the United States by June 1957. It caused about 2 million deaths globally.
- The "Hong Kong Flu", 1968-69. An H3N2 caused about 34,000 deaths in the USA. This virus was first detected in Hong Kong in early 1968, and spread to the USA later that year. This pandemic of 1968 and 1969 killed an estimated one million people worldwide. Influenza A (H3N2) viruses still circulate today.

Typhus

Typhus is sometimes called "camp fever" ("gaol fever","ship fever") because of its pattern of flaring up in times of strife. Emerging during the Crusades, it had its first impact in Europe in 1489, in Spain. During fighting between the Christian Spaniards and the Muslims in Granada, the Spanish lost 3,000 to war casualties, and 20,000 to typhus.

In 1528, the French lost 18,000 troops in Italy, and lost supremacy in Italy to the Spanish. In 1542, 30,000 soldiers died of typhus while fighting the Ottomans in the Balkans.

During the Thirty Years' War (1618–1648), an estimated 8 million Germans were wiped out by bubonic plague and typhus fever. The disease also played a major role in the destruction of Napoleon's *Grande Armee* in Russia in 1812.

Felix Markham thinks that 450,000 soldiers crossed the Neman on 25 June 1812, of whom less than 40,000 recrossed in anything like a recognizable military formation. In early 1813 Napoleon raised a new army of 500,000 to replace his Russian losses. In the campaign of that year over 219,000 of Napoleon's soldiers were to die of typhus. Typhus played a major factor in the Irish Potato Famine. During the World War I, typhus epidemics have killed over 150,000 in Serbia. There were about 25 million infections and 3 million deaths from epidemic typhus in Russia from 1918 to 1922. Typhus also killed numerous prisoners in the Nazi concentration camps and Soviet prisoner of war camps during World War II. (3.5 mln. out of 5.7 mln.)

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Make up some dialogues from the information above.

Exercise 3. Generate all events which are in the text.

Tuberculosis

One-third of the world's current population has been infected with *tuberculosis*, and new infections occur at a rate of one per second. About one in ten of these latent infections will eventually progress to active disease, which, if left untreated, kills more than half of its victims.

Annually, 8 million people become ill with tuberculosis, and 2 million people die from the disease worldwide.In the 19th century, tuberculosis killed an estimated one-quarter of the adult population of Europe; and by 1918 one in six deaths in France were still caused by TB.

By the late 19th century, 70 to 90% of the urban populations of Europe and North America were infected with *M. tuberculosis*, and about 40% of working-class deaths in cities were from TB.

During the 20th century, tuberculosis killed approximately 100 million people. TB is still one of the most important health problems in the developing world.

Leprosy

Leprosy, also known as Hansen's Disease, is caused by a bacillus, *Mycobacterium leprae*. It is a chronic disease with an incubation period of up to five years. Since 1985, 15 million people worldwide have been cured of leprosy. In 2002, 763,917 new cases were detected. It is estimated that there are between one and two million people permanently disabled because of leprosy. Historically, leprosy has affected mankind since at least 600 BC, and was well-recognized in the civilizations of ancient China, Egypt and India. During the High Middle Ages, Western Europe witnessed an unprecedented outbreak of leprosy. Numerous *leprosaria*, or leper hospitals, sprang up in the Middle Ages; Matthew Paris estimated that in the early 13th century there were 19,000 across Europe.

Malaria

Malaria is widespread in tropical and subtropical regions, including parts of the Americas, Asia, and Africa. Each year, there are approximately 350–500 million cases of malaria. Drug resistance poses a growing problem in the treatment of malaria in the 21st century, since resistance is now common against all classes of antimalarial drugs, with the exception of the artemisinins.

Malaria was once common in most of Europe and North America, where it is now for all purposes non-existent. Malaria may have contributed to the decline of the Roman Empire. The disease became known as "Roman fever". *Plasmodium falciparum* became a real threat to colonists and indigenous people alike when it was introduced into the Americas along with the slave trade.

Malaria devastated the Jamestown colony and regularly ravaged the South and Midwest. By 1830 it had reached the Pacific Northwest. During the American Civil War, there were over 1.2 million cases of malaria among soldiers of both sides. The southern U.S. continued to be afflicted with millions of cases of malaria into the 1930s.

Yellow fever

Yellow fever has been a source of several devastating epidemics. Cities as far north as New York, Philadelphia, and Boston were hit with epidemics. In 1793, the largest yellow fever epidemic in U.S. history killed as many as 5,000 people in Philadelphia – roughly 10% of the population. About half of the residents had fled the city, including President G. Washington. Approximately 300,000 people died from yellow fever in Spain during the 19th century. In colonial times, West Africa became known as "the white man's grave" because of malaria and yellow fever.

Exercise 4. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

CONCERN ABOUT POSSIBLE FUTURE PANDEMICS

There are a number of unknown diseases that were extremely serious but have now vanished, so the etiology of these diseases cannot be established. The cause of English Sweat in 16th-century England, which struck people down in an instant and was more greatly feared than even the bubonic plague, is still unknown.

Some Viral Hemorrhagic Fever causing agents like Lassa fever, Rift Valley fever, Marburg virus, Ebola virus and Bolivian hemorrhagic fever are highly contagious and deadly diseases, with the theoretical potential to become pandemics. Their ability to spread efficiently enough to cause a pandemic is limited, however, as transmission of these viruses requires close contact with the infected vector, and the vector only has a short time before death or serious illness.

Furthermore, the short time between a vector becoming infectious and the onset of symptoms allows medical professionals to quickly quarantine vectors, and prevent them from carrying the pathogen elsewhere. Genetic mutations could occur, which could elevate their potential for causing widespread harm; thus close observation by contagious disease specialists is merited.

Antibiotic-resistant microorganisms, sometimes referred to as "superbugs", may contribute to the re-emergence of diseases which are currently well-controlled. For example, cases of tuberculosis that are resistant to traditionally effective treatments remain a cause of great concern to health professionals.

Every year, nearly half a million new cases of multidrug-resistant tuberculosis (MDR-TB) are estimated to occur worldwide. After India, China has the highest rate of multidrug-resistant TB.

The World Health Organization (WHO) reports that approximately 50 million people worldwide are infected with MDR TB, with 79 % of those cases resistant to three or more antibiotics. In 2005, 124 cases of MDR TB were reported in the United States. Extensively drug-resistant tuberculosis (XDR TB) was identified in Africa in 2006, and subsequently discovered to exist in 49 countries, including the USA. About 40,000 new cases of XDR-TB emerge every year, the WHO estimates.

The plague bacterium *Yersinia pestis* could develop drug-resistance and become a major health threat. Plague epidemics have occurred throughout human history, causing over 200 million deaths worldwide. The ability to resist many of the antibiotics used against plague has been found so far in only a single case of the disease in Madagascar.

In the past 20 years, common bacteria including Staphylococcus aureus, Serratia marcescens and Enterococcus, have developed resistance to various antibiotics such as vancomycin, as well as whole classes of antibiotics, such as the aminoglycosides and cephalosporins. Antibiotic-resistant organisms have become an important cause of healthcare-associated (nosocomial) infections (HAI).

Infections caused by community-acquired strains of methicillin-resistant *Staphylococcus aureus* (MRSA) in otherwise healthy individuals have become more frequent in recent years. Inappropriate antibiotic treatment and overuse of antibiotics have been a contributing factor to the emergence of resistant bacteria. The problem is further exacerbated by self-prescribing of antibiotics by individuals without the guidelines of a qualified clinician and the non-therapeutic use of antibiotics as growth promoters in agriculture.

In 2003, there were concerns that Severe Acute Respiratory Syndrome (SARS), a new and highly contagious form of atypical pneumonia, might become pandemic. It is caused by a coronavirus dubbed SARS-CoV. Rapid action by national and international health authorities such as the World Health Organization helped to slow transmission and eventually broke the chain of transmission.

That ended the localized epidemics before they could become a pandemic. However, the disease has not been eradicated. It could re-emerge. This warrants monitoring and reporting of suspicious cases of atypical pneumonia. Wild aquatic birds are the natural hosts for a range of influenza A viruses. Occasionally, viruses are transmitted from these species to other species, and may then cause outbreaks in domestic poultry or (rarely) give rise to a human pandemic.

In February 2004, avian influenza virus was detected in birds in Vietnam, increasing fears of the emergence of new variant strains.

It is feared that if the avian influenza virus combines with a human influenza virus (in a bird or a human), the new subtype created could be both highly contagious and highly lethal in humans. Such a subtype could cause a global influenza pandemic, similar to the Spanish Flu, or the lower mortality pandemics such as the Asian Flu and the Hong Kong Flu.

From October 2004 to February 2005, some 3,700 test kits of the 1957 Asian Flu virus were accidentally spread around the world from a lab in the US.

In May 2005, scientists urgently call nations to prepare for a global influenza pandemic that could strike as much as 20% of the world's population.

In October 2005, cases of the avian flu (the deadly strain H5N1) were identified in Turkey. EU Health Commissioner Markos Kyprianou said: "We have received now confirmation that the virus found in Turkey is an avian flu H5N1 virus. There is a direct relationship with viruses found in Russia, Mongolia and China." Cases of bird flu were also identified shortly thereafter in Romania, and then Greece. Possible cases of the virus have also been found in Croatia, Bulgaria and the UK.

By November 2007, numerous confirmed cases of the H5N1 strain had been identified across Europe. However, by the end of October only 59 people had died as a result of H5N1 which was atypical of previous influenza pandemics.

Avian flu cannot yet be categorized as a "pandemic", because the virus cannot yet cause sustained and efficient human-to-human transmission. Cases so far are recognized to have been transmitted from bird to human, but as of December 2006 there have been very few (if any) cases of proven human-to-human transmission. Regular influenza viruses establish infection by attaching to receptors in the throat and lungs, but the avian influenza virus can only attach to receptors located deep in the lungs of humans, requiring close, prolonged contact with infected patients, and thus limiting person-to-person transmission.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Translate the words and phrases into Russian drawing up sentences with them.

Pain, spasm of pain, stab of pain, twinge of pain, to allay (alleviate, ease, relieve, soothe) pain, to be in chronic pain, to bear (endure, stand, take) pain, to cause pain, to feel (experience, suffer) pain, to feel a pang of pain, to inflict pain on, to remove pain, pains and penalties, to have one's labour for one's pains, no pain, no gain, under pain of death, to save one's pains, to take pains, be at pains, acute pain, chest pain, dull pain, excruciating pain, pain barrier, piercing pain, stabbing pain, throbbing pain, to pain smb.'s feelings, to be at pains, to feel no pain, to give smb. a pain in the ass, to give smb. a pain in the neck, on pain of smth., to put out of pain, under pains and penalties of law, under pain of punishment, upon the pains, pain and suffering, pain control, pain in deglutition, (joints), pain killer.

Exercise 3. Make up some dialogues from the information above.

Exercise 4. Analyze the information and use it in practice.

Exercise 5. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

BIOLOGICAL WARFARE

In 1346, the bodies of Mongol warriors who had died of plague were thrown over the walls of the besieged Crimean city of Kaffa (now Theodosia). After a protracted siege, during which the Mongol army under Jani Beg was suffering the disease, they catapulted the infected corpses over the city walls to infect the inhabitants. It has been speculated that this operation may have been responsible for the advent of the Black Death in Europe.

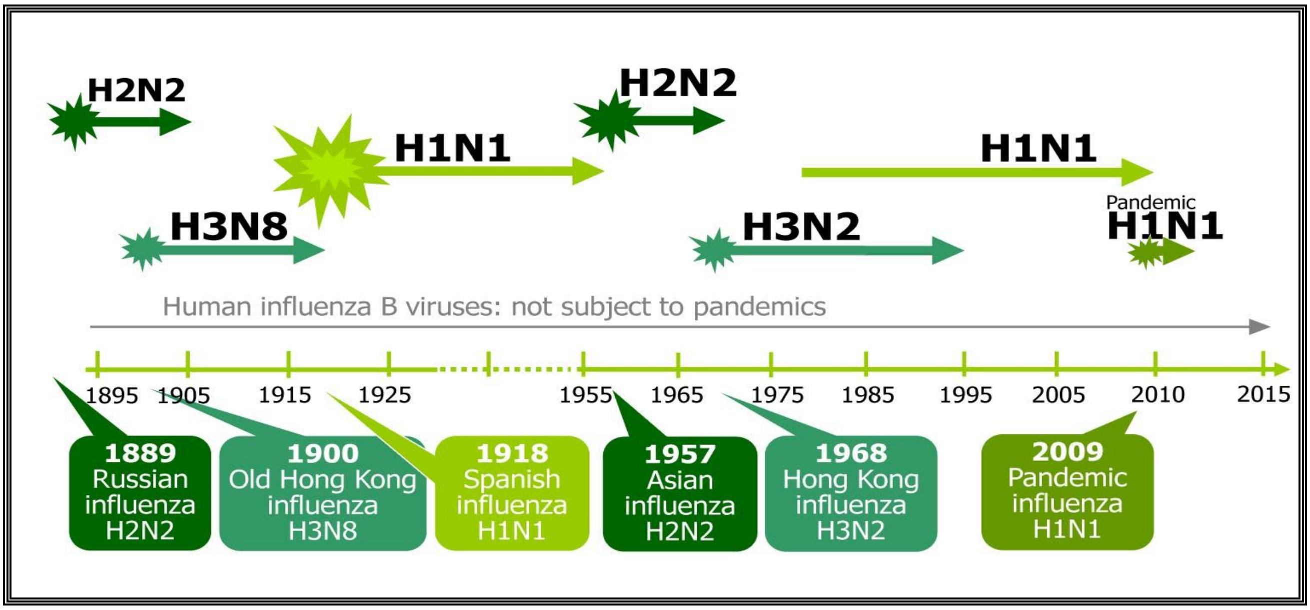
The Native American population was decimated after contact with the Old World due to the introduction of many different fatal diseases. There is, however, only one documented case of germ warfare, involving British commander Jeffrey Amherst and Swiss-British officer Colonel Henry Bouquet, whose correspondence included a reference to the idea of giving smallpox-infected blankets to Indians as part of an incident known as Pontiac's Rebellion which occurred during the Siege of Fort Pitt (1763) late in the French and Indian War. It is uncertain whether this documented British attempt successfully infected the Indians.

During the Sino-Japanese War (1937-1945), Unit 731 of the Imperial Japanese Army conducted human experimentation on thousands, mostly Chinese. In military campaigns, the Japanese army used biological weapons on Chinese soldiers and civilians.

Plague fleas, infected clothing, and infected supplies encased in bombs were dropped on various targets. The resulting cholera, anthrax, and plague were estimated to have killed around 400,000 Chinese civilians. Diseases considered for weaponization, or known to be weaponized include anthrax, ebola, Marburg virus, plague, cholera, typhus, Rocky Mountain spotted fever, tularemia, brucellosis, Q fever, machupo, Coccidioides mycosis, Glanders, Melioidosis, Shigella, Psittacosis, Japanese B encephalitis, Rift Valley fever, yellow fever, and smallpox.

Spores of weaponized anthrax were accidentally released from a military facility near the Soviet closed city of Sverdlovsk in 1979. The Sverdlovsk anthrax leak is sometimes called "biological Chernobyl". China possibly suffered a serious accident at one of its biological weapons plants in the late 1980s. The Soviets suspected that two separate epidemics of hemorrhagic fever that swept the region in the late 1980s were caused by an accident in a lab where Chinese scientists were weaponizing viral diseases. In January 2009, an Al-Qaeda training camp in Algeria had been wiped out by the plague, killing approximately 40 Islamic extremists. Experts said that the group was developing biological weapons.

Exercise 1. Analyze the biological warfare.



Recorded human pandemic influenza

HISTORY OF PLAGUES

Plagues retain an important place in human history. Humanity has always been vulnerable to and fearful of infectious disease, which has wrought misery, devastation, and havoc throughout the world since ancient times. Times of pestilence have interrupted human affairs and brought great suffering which, in historic times, has often been described and reported in detail.

Outbreaks result in extreme loss of life and damage to institutions and economies. In early cities, large populations were concentrated into crowded communities that often had limited access to fresh water and unregulated disposal of waste. In these communities, waves of disease, whatever the agent of infection, created terror and panic.

Accounts of armies that were depleted or defeated by bouts of infection stretch back to the ancient world, and epidemics have frequently ruined the plans and ambitions of military leaders.

Two well-known examples of the impact of disease on history are the Black Death, which periodically visited various peoples throughout Asia and Europe between the 14th-17th centuries, and the overwhelming pandemics of measles and smallpox, as well as other Eurasian diseases, which Europeans brought to people in the New World.

Both of these devastating occurrences were made more severe by the fact that each population was "biologically naïve". When a population that has been relatively isolated is exposed to a new disease or a group of new diseases, it has no inborn resistance; the human body succumbs at a much higher rate, resulting in what is known as a "virgin soil" epidemic.

During the disease outbreak of the Middle Ages, the single word "plague" was associated with a disease which reached epidemic and even pandemic proportions in Asia and Europe. The general consensus is that this was caused by bubonic plague and its variants, disease of the lymphatic system caused by the bacillus *Yersinia pestis*, which can be spread by fleas from rodents to humans.

However, recent investigations have suggested otherwise, with some research suggesting that the ongoing outbreaks were caused by a viral hemorrhagic disease, perhaps similar to Ebola. The disease was known in isolated pockets in Asia but had rarely been seen west of the Byzantine empire.

Sweeping outbreaks in Medieval Europe drastically decreased the population, disrupting several vital civilizations and are considered to have significantly altered the course of human affairs.

Before the European arrival, the Americas had been largely isolated from the Eurasian-African landmass. First large-scale contacts between Europeans and native people of the American continents brought overwhelming pandemics of measles and smallpox, as well as other Eurasian diseases.

These diseases spread rapidly among native peoples, often ahead of actual contact with Europeans, and led to a drastic drop in population and the collapse of American cultures.

Smallpox and other diseases invaded and crippled the Aztec and Inca civilizations in Central and South America in the 16th century. This disease, with loss of population and death of military and social leaders, contributed to the downfall of both American empires and the subjugation of American peoples to Europeans. A devastating smallpox epidemic, likely spread to the New World by European cod fisherman, in 1610 was the only reason that the land chosen for the Plymouth Colony was not inhabited when the pilgrim settlers arrived and, in fact, the resulting weakness and instability of the various New England native tribes is likely the only reason the Colony was able to survive and eventually thrive there.

Exercise 1. Analyze the role of plagues in history.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 2. Read the list of historical plagues and remember it.

In human history, the term "plague" refers to an epidemic disease causing a high rate of mortality, i.e. a pestilence. An epidemic – disease outbreaks that strike a large number of people in an area at the same time – may also become a pandemic when it spreads over a wide geographical area or throughout many countries. Bubonic plague, typhus, smallpox, cholera, yellow fever, influenza, scarlet fever, malaria, diphtheria, and poliomyelitis are some infectious diseases that have resulted in epidemic or pandemic outbreaks. Plagues of disease are a major factor in the development of human civilization, impacting and altering the course of wars, migrations, population growth, urbanization, industry, and cultural development. The term carries such extreme connotations that it is often synonymous with a "calamity", projecting an image of a disastrous evil or affliction.

Exercise 3. Pay attention to major plague outbreaks.

Diseases, however, passed in both directions; syphilis was carried back from the Americas and swept through the European population, killing large numbers. The danger posed by epidemic disease has not been eliminated by modern health and hygiene practices. The ever-enlarging human population, rapid international transportation, developing resistance to medication by known disease agents, insect resistance to insecticides, and medical complacency have all generated new strains of old diseases and increased the possibility of epidemics caused by emerging new diseases.

This list contains famous or well-documented outbreaks of plagues or disease. They are examined in individual entries:

- Great Plague of Athens (430–427 BC)
- Antonine Plague (165–180)
- Plague of Cyprian (250)
- Plague of Justinian (541–542)
- Plague of Emmaus (18 A.H. / 639 A.D.)
- Plague of Constantinople (747–748)
- The "Black Death" of 1347–1351
  - Great Plague of England (1348–1350)
  - Great Plague of Ireland (1348–1351)
  - Great Plague of Scotland (1348–1350)
  - Great Plague of Portugal, the so called Peste Negra (black plague) (1348–1348?)
  - Great Plague of Russia (1349–1353)
- Great Plague of Iceland (1402–1404)
- American Epidemics (Results of Columbian Exchange) (1492-1950s?)
- Plague of 1575, Italy, Sicily and segments of Northern Europe (1571–1576)
- London Plague (1592–1594)
- Italian Plague of 1629–1631 or Great Plague of Milan (1629–1631)
- Plague causing the end of the Ming Dynasty in China (1641-1644)
- Great Plague of Seville (1649)
- Great Plague of London (1665–1666)
- Great Plague of Vienna (1679–1670s)
- Great Plague of Marseille (1720–1722)
- Russian plague of 1770-1772
- The Third Pandemic, originated in China (1855–1950s)
- 1994 plague epidemic in Surat

One of the earliest documented plagues is the Amarna Period plague (14th century B.C.) in Egypt, which may be the cause of the sudden abandonment of the city of Akhet-Aten (today El-Amarna). Bubonic plague, polio and influenza have been suggested as its causal agent. The epidemic spread through the Middle East.

Exercise 4. Choose the keywords that best convey the gist of the information.

Exercise 5. Translate the words and phrases into Russian drawing up sentences with them.

Plague (pestilence), Siberian plague, bubonic plague; pneumonic plague, septicemic plague, the ten plagues of Egypt, plague of grasshoppers (rats), to avoid smb. like a plague, plague bacillus, plague pneumonia, plague serum, plague spot, plague spot of sin and imperfection, plague-infected (plagued), plaguesome, plagu(e)y, plague on it!

Exercise 6. Analyze the notion «bubonic plague».

Bubonic plague is the best known manifestation of the bacterial disease plague, caused by the Gram-negative bacterium *Yersinia pestis* (formerly known as *Pasteurella pestis*). It belongs to the family Enterobacteriaceae. The term "bubonic plague" was often used synonymously for plague, but it does in fact refer specifically to an infection that enters through the skin and travels through the lymphatics, as is often seen in flea-borne infections. Bubonic plague kills about half of infected patients in 3-7 days without treatment, and may be the Black Death that swept through Europe in the 1340s, killing tens of millions. The bubonic plague is an infection of the lymphatic system, usually resulting from the bite of an infected flea, the rat flea. The fleas are often found on rodents, such as rats and mice, and seek out other prey when their rodent hosts die.

The bacteria form aggregates in the gut of infected fleas and this results in the flea regurgitating ingested blood, which is now infected, into the bite site of a rodent or human host.

Once established, bacteria rapidly spread to the lymph nodes and multiply. Yersinia pestis bacilli can resist phagocytosis and even reproduce inside phagocytes and kill them. As the disease progresses, the lymph nodes can haemorrhage and become swollen and necrotic. Bubonic plague can progress to lethal septicemic plague in some cases. The plague is also known to spread to the lungs and become the disease known as the pneumonic plague. This form of the disease is highly infectious as the bacteria can be transmitted in droplets emitted when coughing or sneezing.

Exercise 7. Describe the symptoms of the disease.

The most famous symptom of bubonic plague is painful, swollen lymph glands, called buboes.

These are commonly found in the armpits, groin or neck. The bubonic plague was the first step of the ongoing plague. Two other forms of the plague, pneumonic and septicemic, resulted after a patient with the bubonic plague developed pneumonia or blood poisoning. The Pneumonic plague was the most infectious, as, unlike the bubonic or septicemic, it induced coughing, which allowed person-to-person spread. Other symptoms include spots on the skin that are red at first and then turn black, heavy breathing, continuous blood vomiting, aching limbs, coughing, and terrible pain. The pain is usually caused by the actual decaying, or decomposing, of the skin while the person is still alive.

Exercise 8. Translate the sentences into Russian.

1. I felt a sharp pain in my lower back. 2. She was writhing in pain, bathed in perspiration. 3. She cannot stand any pain. 4. She experienced constant pain. 5. He is such a pain in the neck. 6. This practice of changing the clocks twice a year is a real pain. Many of us take the best part of a week to recover, especially in the spring when we "lose an hour". 7. My head doesn't pain me now. 8. Nothing pains like the truth. 9. She's a real pain. 10. This job is getting to be such a pain.

Exercise 9. Make up some dialogues from the information above.

Exercise 10. Analyze the role of plagues in history.

№	Activity			
	Event	When	Where	Score
1.				

HISTORICAL STAGES

The deadly disease has claimed nearly 200 million lives (although there is some debate as to whether all of the plagues attributed to it are in fact the same disease). The first recorded epidemic ravaged the Byzantine Empire during the sixth century, and was named the Plague of Justinian after emperor Justinian I, who was infected but survived. The most infamous and devastating instance of the plague was the Black Death, which killed a quarter to half of the population of Europe.

The Black Death is thought to have originated in the Gobi Desert. Carried by the fleas on rats, it spread along trade routes and reached the Crimea in 1346. In 1347 it spread to Constantinople and then Alexandria, killing thousands every day, and soon arrived in Western Europe.

It is thought that the name Black Death comes from the fact that the tissue turns a distinctive black color during necrosis, or from the general gloominess surrounding the plague.

The next few centuries were marked by several local outbreaks of lesser severity. The Great Plague of London, 1665-1666, and the Great Plague of Vienna, 1679, were the last major outbreaks of the bubonic plague in Europe. The plague resurfaced in the mid-19th century; like the Black Death, the Third Pandemic began in Central Asia. The disease killed millions in China and India and then spread worldwide. The outbreak continued into the early 20th century.

In 1897, Pune in British India, was severely affected by the outbreak.

The government responded to the plague with a Committee system that used the military to perpetrate repression and tyranny as it tackled the pandemic. Nationalists publicly berated the government. On 22 June 1897, two young brahmins, the Chapekar brothers, shot and killed two British officers, the Committee chairman and his military escort.

This act has been considered a landmark event in India's struggle for freedom as well as the worst violence against political authority seen in the world during the third plague pandemic.

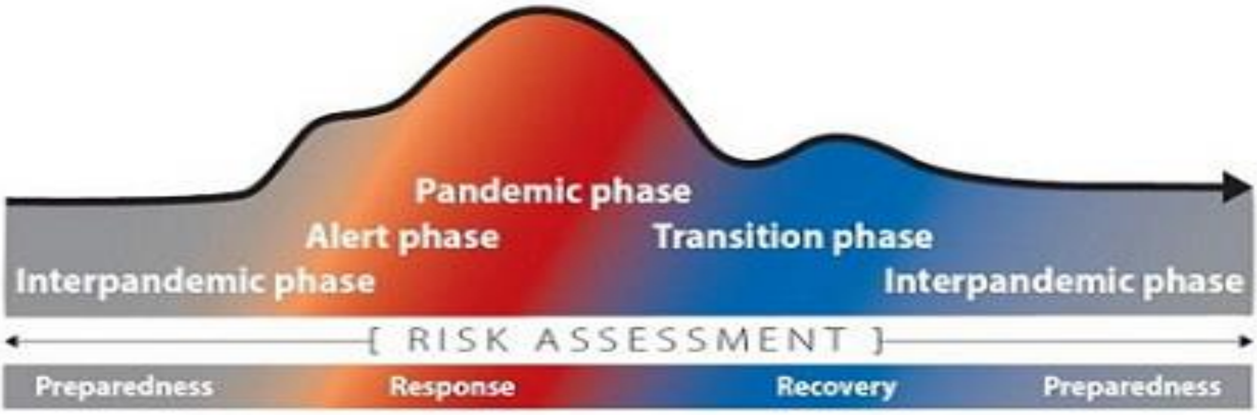
Plague was used during the Second Sino-Japanese War as a bacteriological weapon by the Imperial Japanese Army. These weapons were provided by Shirō Ishii's units and used in experiments on humans before being used on the field.

For example, in 1940, the Imperial Japanese Army Air Service bombed Ningbo with fleas carrying the bubonic plague. During the Khabarovsk War Crime Trials the accused, such as Major General Kiyashi Kawashima, testified that, in 1941, some 40 members of Unit 731 air-dropped plague-contaminated fleas on Changde. These operations caused epidemic plague outbreaks.

In modern times, several classes of antibiotics are effective in treating bubonic plague. These include the aminoglycosides streptomycin and gentamicin, the tetracyclines tetracycline and doxycycline and the fluoroquinolone ciprofloxacin. Patients with plague in the modern era usually recover completely with prompt diagnosis and treatment.

Exercise 1. Define the historical stages.

Exercise 2. Add some in formation and make up a small report and give a talk in class.



1918 FLU PANDEMIC

Two American Red Cross nurses demonstrate treatment practices during the influenza pandemic of 1918. The 1918 flu pandemic (commonly referred to as the Spanish Flu) was an influenza pandemic that spread to nearly every part of the world. It was caused by an unusually virulent and deadly influenza A virus strain of subtype H1N1. Historical and epidemiological data are inadequate to identify the geographic origin of the virus. Most of its victims were healthy young adults, in contrast to most influenza outbreaks which predominantly affect juvenile, elderly, or otherwise weakened patients.

The flu pandemic has also been implicated in the sudden outbreak of encephalitis lethargica in the 1920s. The pandemic lasted from March 1918 to June 1920, spreading even to the Arctic and remote Pacific islands. It is estimated that anywhere from 50 to 100 million people were killed worldwide which is from three to seven times the casualties of the First World War (15 million).

An estimated 50 million people, about 3% of the world's population (approximately 1.6 billion at the time), died of the disease. An estimated 500 million, or 1/3 were infected. Scientists have used tissue samples from frozen victims to reproduce the virus for study. Given the strain's extreme virulence there has been controversy regarding the wisdom of such research. Among the conclusions of this research is that the virus kills via a cytokine storm (overreaction of the body's immune system) which explains its unusually severe nature and the concentrated age profile of its victims.

The strong immune systems of young adults ravaged the body, whereas the weaker immune systems of children and middle-aged adults caused fewer deaths. The global mortality rate from the 1918/1919 pandemic is not known, but it is estimated that 10% to 20% of those who were infected died. With about a third of the world population infected, this case-fatality ratio means that 3% to 6% of the entire global population died. Influenza may have killed as many as 25 million in its first 25 weeks.

Older estimates say it killed 40-50 million people while current estimates say 50-100 million people worldwide were killed. This pandemic has been described as "the greatest medical holocaust in history" and may have killed more people than the Black Death.

As many as 17 million died in India, about 5% of India's population at the time. In Japan, 23 million people were affected, and 390,000 died. In the U.S., about 28% of the population suffered, and 500,000 to 675,000 died. In Britain as many as 250,000 died; in France more than 400,000.

In Canada approximately 50,000 died. Entire villages perished in Alaska and southern Africa Ras Tafari (the future Haile Selassie) was one of the first Ethiopians who contracted influenza but survived, although many of his subjects did not; estimates for the fatalities in the capital city, Addis Ababa, range from 5,000 to 10,000, with some experts opining that the number was even higher, while in British Somaliland one official there estimated that 7% of the native population died from influenza. In Dutch East Indies (now Indonesia), around 1.5 million assumed died from 30 million inhabitants.

In Australia an estimated 12,000 people died and in the Fiji Islands, 14% of the population died during only two weeks, and in Western Samoa 22%. This huge death toll was caused by an extremely high infection rate of up to 50% and the extreme severity of the symptoms, suspected to be caused by cytokine storms. Indeed, symptoms in 1918 were so unusual that initially influenza was misdiagnosed as dengue, cholera, or typhoid. One observer wrote, "One of the most striking of the complications was hemorrhage from mucous membranes, especially from the nose, stomach, and intestine.

Bleeding from the ears and petechial hemorrhages in the skin also occurred." The majority of deaths were from bacterial pneumonia, a secondary infection caused by influenza, but the virus also killed people directly, causing massive hemorrhages and edema in the lung. The unusually severe disease killed between 2 and 20% of those infected, as opposed to the more usual flu epidemic mortality rate of 0.1%. Another unusual feature of this pandemic was that it mostly killed young adults, with 99% of pandemic influenza deaths occurring in people under 65, and more than half in young adults 20 to 40 years old. This is unusual since influenza is normally most deadly to the very young (under age 2) and the very old (over age 70).

It may have been due to partial protection caused by exposure to a previous Russian flu pandemic of 1889. Although the first cases of the disease were registered in the continental U.S, and the rest of Europe long before getting to Spain, the 1918 Flu received its nickname "Spanish flu" because Spain, a neutral country in WWI, had no special censorship for news against the disease and its consequences. Hence the most reliable news on the disease came from Spain, giving the false impression that Spain was the most – if not the only – affected zone. While World War I did not cause the flu, the close troop quarters and massive troop movements hastened the pandemic and probably increased transmission, augmented mutation and may have increased the lethality of the virus.

Some researchers speculate that the soldiers' immune systems were weakened by malnourishment as well as the stresses of combat and chemical attacks, increasing their susceptibility to the disease.

Price-Smith has made the controversial argument that the virus helped tip the balance of power in the latter days of the war towards the Allied cause. Specifically, he provides data that the viral waves hit the Central Powers before they hit the Allied powers, and that both morbidity and mortality in Germany and Austria were considerably higher than in Britain and France.

A large factor of worldwide flu occurrence was increased travel. Modern transportation systems made it easier for soldiers, sailors, and civilian travelers to spread the disease quickly to communities worldwide. Some scholars have theorized that the flu probably originated in the Far East. Dr. C. Hannoun, leading expert of the 1918 flu for the Institut Pasteur, theorized that the former virus was likely to have come from China, mutated in the USA and spread to Europe's battlefields, and the world using Allied soldiers and sailors as main spreaders. Hannoun considered several other theories of origin, such as Spain, Kansas, and Brest, as being possible but not likely. Historian Alfred W. Crosby observed that the flu seems to have originated in Kansas.

Political scientist Andrew Price-Smith suggested that the influenza had earlier origins, beginning in Austria in the spring of 1917. Popular writer John Barry echoed Crosby described Kansas as the likely point of origin. In the USA the disease was first observed at Kansas in 1918.

In August 1918, a more virulent strain appeared simultaneously in Brest, France, in Freetown, Sierra Leone, and in the U.S. at Boston, Massachusetts. The Allies of World War I came to call it the Spanish flu, primarily because the pandemic received greater press attention after it moved from France to Spain in November 1918. Spain was not involved in the war and had not imposed wartime censorship. Investigative work by a British team, led by virologist John Oxford has suggested that a principal British troop staging camp in Etaples, France was at the center of the 1918 flu pandemic, or was the location of a significant precursor virus.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Describe devastated communities.

Even in areas where mortality was low, so many people were incapacitated that much of everyday life stopped. Some communities closed all stores or required customers to leave their orders outside. There were many reports of places where the health-care workers could not tend the sick nor the grave-diggers bury the dead because they too were ill.

Mass graves were dug by steam shovel and bodies buried without coffins in many places. Several Pacific island territories were particularly hard-hit. The pandemic reached them from New Zealand, which was too slow to implement measures to prevent ships carrying the flu from leaving its ports. From New Zealand the flu reached Tonga (killing 8% of the population), Nauru (16%) and Fiji (5%, 9,000 people). Worst affected was Western Samoa, a territory then under New Zealand military administration.

A crippling 90% of the population was infected; 30% of adult men, 22% of adult women and 10% of children were killed. By contrast, the flu was kept away from American Samoa by a commander who imposed a blockade. In New Zealand itself 8,573 deaths were attributed to the 1918 pandemic influenza, resulting in a total population fatality rate of 7.4 per thousand (0.74%).

Exercise* 3. *Analyze the patterns of fatality.

The influenza strain was unusual in that this pandemic killed many young adults and otherwise healthy victims; typical influenzas kill mostly weak individuals, such as infants (aged 0-2 years), the elderly, and the immunocompromised. Older adults may have had some immunity from the earlier Russian flu pandemic of 1889. Another oddity was that the outbreak was widespread in the summer and autumn (in the Northern Hemisphere); influenza is usually worse in winter. In fast-progressing cases, mortality was primarily from pneumonia, by virus-induced pulmonary consolidation.

Slower-progressing cases featured secondary bacterial pneumonias, and there may have been neural involvement that led to mental disorders in some cases. Some deaths resulted from malnourishment and even animal attacks in overwhelmed communities.

The second wave of the 1918 pandemic was much deadlier than the first. The first wave had resembled typical flu epidemics; those most at risk were the sick and elderly, while younger, healthier people recovered easily. But in August, when the second wave began in France, Sierra Leone and the United States, the virus had mutated to a much deadlier form.

This has been attributed to the circumstances of the First World War. In civilian life evolutionary pressures favour a mild strain: those who get really sick stay home, and those mildly ill continue with their lives, go to work and go shopping, preferentially spreading the mild strain.

In the trenches the evolutionary pressures were reversed: soldiers with a mild strain remained where they were, while the severely ill were sent on crowded trains to crowded field hospitals, spreading the deadlier virus. So the second wave began and flu quickly spread around the world again. It was the same flu, in that most of those who recovered from first-wave infections were immune, but it was now far more deadly. Consequently, during modern pandemics, health officials pay attention when the virus reaches places with social upheaval, looking for deadlier strains of the virus.

Exercise 4. Name less affected areas.

In Japan, 257,363 deaths were attributed to influenza by July 1919, giving an estimated 0.425% mortality rate, much lower than nearly all other Asian countries for which data are available.

The Japanese government severely restricted maritime travel to and from the home islands when the pandemic struck. In the Pacific, American Samoa and the French colony of New Caledonia also succeeded in preventing even a single death from influenza through effective quarantines. In Australia, nearly 12,000 perished. After the lethal second wave struck in the autumn of 1918, the disease died down abruptly. New cases almost dropped to nothing after the peak in the second wave. In Philadelphia for example, 4,597 people died in the week ending October 16, but by November 11 influenza had almost disappeared from the city.

One explanation for the rapid decline of the lethality of the disease is that doctors simply got better at preventing and treating the pneumonia which developed after the victims had contracted the virus, although John Barry states in his book that researchers have found no evidence to support this. Another theory holds that the 1918 virus mutated extremely rapidly to a less lethal strain. This is a common occurrence with influenza viruses: there is a general tendency for pathogenic viruses to become less lethal with time, providing more living hosts.

***Exercise 5. Translate the sentences into Russian*.**

1. He's been a real pain lately. 2. Your aunt is feeling no pain now. She slipped away before dawn. 3. He was carried out of the room evidently feeling no pain. 4. It is a well-established fact that I give her a pain in the neck. 5. Idle folk take the most pains. 6. Now, you know the pains and penalties you are liable to, and I need not dilate upon them... . 7. It was disconcerting to have taken pains to spare someone else's feelings only to find they didn't exist. 8. He was not going to lose what he had taken such pains to obtain. 9. She was writhing in pain, bathed in perspiration. 10. She cannot stand any pain. 11. She experienced constant pain. 12. She is at pains to point out how much work she has done.

SPANISH FLU RESEARCH

Centers for Disease Control and Prevention's Dr. Terrence Tumpey examining a reconstructed version of the 1918 flu. One theory is that the virus strain originated at Fort Riley, Kansas, by two genetic mechanisms – genetic drift and antigenic shift – in viruses in poultry and swine which the fort bred for food; the soldiers were then sent from Fort Riley to different places around the world, where they spread the disease. However, evidence from a recent reconstruction of the virus suggests that it jumped directly from birds to humans, without traveling through swine. This suggestion is slightly controversial, and other research suggests that the strain originated in a mammalian species.

An effort to recreate the 1918 flu strain (a subtype of avian strain H1N1) was a collaboration among the Armed Forces Institute of Pathology, Southeast Poultry Research Laboratory and Mount Sinai School of Medicine in New York City; the effort resulted in the announcement (on October 5, 2005) that the group had successfully determined the virus's genetic sequence, using historic tissue samples recovered by pathologist Johan Hultin from a female flu victim buried in the Alaskan permafrost and samples preserved from American soldiers.

On January 18, 2007, Kobasa et al. reported that monkeys (Macaca fascicularis) infected with the recreated strain exhibited classic symptoms of the 1918 pandemic and died from a cytokine storm – an overreaction of the immune system.

This may explain why the 1918 flu had its surprising effect on younger, healthier people, as a person with a stronger immune system would potentially have a stronger overreaction. On September 16, 2008, the body of Yorkshireman Sir Mark Sykes was exhumed to study the RNA of the Spanish flu virus in efforts to understand the genetic structure of modern H5N1 bird flu. Sykes had been buried in 1919 in a lead coffin which scientists hope will have helped preserve the virus.

In December 2008, research by Yoshihiro Kawaoka of the University of Wisconsin linked the presence of three specific genes (termed PA, PB1, and PB2) and a nucleoprotein derived from 1918 flu samples to the ability of the flu virus to invade the lungs and cause pneumonia. The combination triggered similar symptoms in animal testing. The original date of appearance of this virus is not clear.

An estimated date for its appearance in mammalian hosts has been put at the period 1882-1913. This ancestor virus diverged about 1913-1915 into two clades which gave rise to the classical swine and human H1N1 influenza lineages. The last common ancestor of human strains dates to between February 1917 and April 1918. Because pigs are more readily infected with avian influenza viruses than are humans, it is likely that they were the original recipient of the virus. This in turn suggests that the virus was introduced into humans sometime between 1913 and 1918.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Make up some dialogues from the information above.

Exercise 3. Remember the information.

20th century outbreaks:

1918 Spanish Flu	1976 Swine Flu scare
1957 Asian Flu	1977 Russian Flu scare
1968 Hong Kong Flu	1987 Avian Flu scare

Exercise 4. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 5. Analyze 2009 flu pandemic.

2009 flu pandemic data

Area	Confirmed deaths	Increase in last 7 days
Worldwide (total)	**6,021**	**+686 (11%)†**
European Union & EFTA	292	+54 (18%)
Other European countries & Central Asia	6	+6 (100%)
Mediterranean and Middle East	181	+31 (17%)
Africa	108	+2 (2%)
North America	1,421	+474 (33%)†
Central America and Caribbean	166	+6 (4%)
South America	2,693	+34 (1%)
Northeast Asia and South Asia	586	+54 (9%)
Southeast Asia	357	+25 (7%)
Australia and Pacific	211	+0 (0%)
Source: ECDC – October 29, 2009		

The 2009 flu pandemic is a global outbreak of a new strain of influenza A virus subtype H1N1, termed Pandemic H1N1/09 virus by the World Health Organization (WHO), that was first identified in April 2009. The disease has also been termed 2009 H1N1 Flu by the U.S. Centers for Disease Control and Prevention (CDC), and colloquially called swine flu.

The outbreak was first observed in Mexico, with evidence that there had been an ongoing epidemic for months before it was officially recognized as such. The Mexican government soon closed most of Mexico City's public and private offices and facilities to contain the spread of the virus. As the virus quickly spread globally, clinics were overwhelmed by testing and treating patients, and the WHO and the CDC eventually stopped counting all cases and focused instead on tracking major outbreaks.

On June 11, 2009, WHO declared the outbreak to be a pandemic. Only mild symptoms are experienced by the overwhelming majority of victims, but there are exceptions. Some persons are in higher risk groups, such as those with asthma, diabetes, obesity, heart disease, children with neurodevelopmental conditions, or persons who are pregnant or have a weakened immune system.

And there are small subsets of patients, even among young persons previously healthy, in which the patient rapidly develops severe pneumonia, typically 3 to 5 days after initial onset of symptoms. Deterioration can be very rapid, with many patients progressing to respiratory failure within 24 hours, requiring intensive care and ventilation support. There is a somewhat different pattern in which a child, including a child who is generally quite healthy, seems to be recovering and then relapses with high fever. This can be a secondary infection of bacterial pneumonia, which needs treatment with antibiotics. Like other influenza viruses, novel H1N1 influenza is typically contracted by inhaling air that has been contaminated by an infected person coughing or sneezing, or by touching one's nose or mouth with hands that have previously touched contaminated surfaces and have not been disinfected. Symptoms, which last up to a week, are similar to those of seasonal flu, and can include fever, sneezing, sore throat, cough, headache, and muscle or joint pains.

Exercise 6. Explain the cultural impact.

In the United States, the United Kingdom and other countries, despite the relatively high morbidity and mortality rates that resulted from the epidemic in 1918-1919, the Spanish flu began to fade from public awareness over the decades until the arrival of news about bird flu and other pandemics in the 1990s and 2000s. This has led some historians to label the Spanish flu a "forgotten pandemic".Several theories have been offered as to why the Spanish flu may have been "forgotten" by historians and the public over so many years.

These include the rapid pace of the pandemic, previous familiarity with pandemic disease in the late 19th and early 20th centuries, and the distraction of the First World War. Another explanation involves the age group affected by the disease. The majority of fatalities, from both the war and the epidemic, were among young adults. The deaths caused by the flu may have been overlooked due to the large numbers of deaths of young men in the war or as a result of injuries. When people read the obituaries of the era, they saw the war or post-war deaths and the deaths from the influenza side by side. Particularly in Europe, where the war's toll was extremely high, the flu may not have had a great, separate, psychological impact, or may have seemed a mere "extension" of the war's tragedies.

The duration of the pandemic and the war could have also played a role: the disease would usually only affect a certain area for a month before leaving, while the war, which most expected to end quickly, had lasted for four years by the time the pandemic struck. This left little time for the disease to have a significant impact on the economy. During this time period pandemic outbreaks were not uncommon: typhoid, yellow fever, diphtheria, and cholera all occurred near the same time period. These outbreaks probably lessened the significance of the influenza pandemic for the public.

Exercise 7. Follow the historical context.

Annual influenza epidemics are estimated to affect 5-15% of the global population. Although most cases are mild, these epidemics still cause severe illness in 3-5 million people and 250,000–500,000 deaths worldwide. On average 41,400 people die each year in the USA based on data collected between 1979 and 2001. In industrialized countries, severe illness and deaths occur mainly in the high-risk populations of infants, the elderly, and chronically ill patients, although the swine flu outbreak (as well as the 1918 Spanish flu) differs in its tendency to affect younger, healthier people.

In addition to these annual epidemics, Influenza A virus strains caused three global pandemics during the 20th century: the Spanish flu in 1918, Asian flu in 1957, and Hong Kong flu in 1968-69. These virus strains had undergone major genetic changes for which the population did not possess significant immunity. Recent genetic analysis has revealed that three-quarters, or six out of the eight genetic segments of the 2009 flu pandemic strain arose from the North American swine flu strains circulating since 1998, when a new strain was first identified on a factory farm in North Carolina, and which was the first-ever reported triple-hybrid flu virus.

The great majority of deaths in the 1918 flu pandemic were the result of secondary bacterial pneumonia. The influenza virus damaged the lining of the bronchial tubes and lungs of victims, allowing common bacteria from the nose and throat to infect their lungs. Subsequent pandemics have had many fewer fatalities due to the development of antibiotic medicines that can treat pneumonia.

The influenza virus has also caused several pandemic threats over the past century, including the pseudo-pandemic of 1947, the 1976 swine flu outbreak, and the 1977 Russian flu, all caused by the H1N1 subtype. The world has been at an increased level of alert since the SARS epidemic in Southeast Asia. The level of preparedness was further increased and sustained with the advent of the H5N1 bird flu outbreaks because of H5N1's high fatality rate, although the strains currently prevalent have limited human-to-human transmission (anthroponotic) capability, or epidemicity.

People who contracted flu before 1957 appeared to have some immunity to H1N1. Dr. Daniel Jernigan of the CDC has stated: everyone over 52 is not immune, since Americans and Mexicans older than that have died of the new flu."

Exercise 8. Pay attention to initial outbreaks.

It is not known where the virus originated. Analyses in scientific journals have suggested that the H1N1 strain responsible for the current outbreak first evolved in September 2008, and circulated among humans for several months before being identified as a new strain of flu.

The virus was first reported in two US children in March 2009, but health officials have reported that it apparently infected people as early as January 2009 in Mexico. The outbreak was first detected in Mexico City on March 18, 2009; immediately after the outbreak was officially announced, Mexico requested material support from the US, and within days of the outbreak Mexico City was "effectively shut down". Some countries canceled flights to Mexico while others halted trade.

Calls to close the border to contain the spread were rejected. Mexico already had hundreds of cases before the outbreak was officially recognized, and was therefore in the midst of a "silent epidemic". As a result, Mexico was reporting only the most serious cases, possibly leading to a skewed initial estimate of the case fatality rate."

The new strain was first identified by the CDC in two children, neither of whom had been in contact with pigs. The first case, from San Diego County, California, was confirmed from clinical specimens (nasopharyngeal swab) examined by the CDC on April 14, 2009.

A second case, from nearby Imperial County, California, was confirmed on April 17. The patient in the first confirmed case had flu symptoms including fever and cough on clinical exam on March 30, and the second on March 28. It was not identified as a new strain in Mexico until April 24.

On April 27, the European Union health commissioner advised Europeans to postpone nonessential travel to the United States or Mexico. This followed the discovery of the first confirmed case in Spain. On May 6, 2009, the Public Health Agency of Canada announced that their National Microbiology Laboratory (NML) had mapped the genetic code of the swine flu virus, the first time that was done.

In England, the National Health Service launched a website, the National Pandemic Flu Service, allowing patients to self-assess and get an authorization number for antiviral medication.

The system was expected to reduce the burden on general practitioners. US officials observed that six years of worrying about H5N1 avian flu did much to prepare for the current swine flu outbreak, noting that after H5N1 emerged in Asia, ultimately killing about 60% of the few hundred people infected by it over the years, many countries took steps to try to prevent any similar crisis from spreading further.

The CDC and other American governmental agencies used the summer lull to take stock of the United States's response to the new H1N1 flu and attempt to patch any gaps in the public health safety net before flu season started in early autumn. Preparations included planning a second influenza vaccination program in addition to the one for seasonal influenza, and improving coordination between federal, state, and local governments and private health providers.

On October 24, 2009, USA President Obama declared H1N1 flu a national emergency, granting Secretary of Health and Human Services Kathleen Sebelius power to authorize waivers as individual medical facilities request them. More fully, the declaration does "hereby find and proclaim that, given that the rapid increase in illness across the Nation may overburden health care resources and that the temporary waiver of certain standard Federal requirements may be warranted in order to enable U.S. health care facilities to implement emergency operations plans, the 2009 H1N1 influenza pandemic in the USA constitutes a national emergency."

Exercise 9. Analyze the information, which is in the highlight, and use it in practice.

Exercise 10. Make up some dialogues from the information above.

Exercise 11. Write a small essay on the topic.

Exercise 12. Add some information & make up a small report and give a talk in class.

VIRUS CHARACTERISTICS

The virus is a novel strain of influenza, and existing vaccines against seasonal flu provide no protection. A study at the US Centers for Disease Control and Prevention, published in May 2009, found that children had no preexisting immunity to the new strain but that adults, particularly those over 60, had some degree of immunity.

Children showed no cross-reactive antibody reaction to the new strain, adults aged 18 to 64 had 6-9%, and older adults 33%. It was also determined that the strain contained genes from five different flu viruses: North American swine influenza, North American avian influenza, human influenza, and two swine influenza viruses typically found in Asia and Europe.

Further analysis showed that several proteins of the virus are most similar to strains that cause mild symptoms in humans, leading virologist Wendy Barclay to suggest on 1 May 2009 that the initial indications are that the virus was unlikely to cause severe symptoms for most people.

In July 2009, the CDC noted that most infections were mild, similar to seasonal flu, recovery tended to be fairly quick, and deaths to date had been only a fraction of the number of people who die every year from seasonal flu. The 1918 flu epidemic began with a wave of mild cases in the spring, followed by more deadly waves in the autumn, eventually killing hundreds of thousands in the United States. Researchers from the University of Maryland mixed swine flu and seasonal flu and concluded that the swine flu was unlikely to get more lethal.

And, for more regarding the probable or possible history of Novel H1N1, a July 9, 2009, New England Journal of Medicine article states: "H1N2 and other subtypes are descendants of the triple-reassortant swine H3N2 viruses isolated in North America. They have spread in swine hosts around the globe and have been found to infect humans.

The segments coding for the neuraminidase and the matrix proteins of the new human H1N1 virus are, however, distantly related to swine viruses isolated in Europe in the early 1990s." Spread of 2009 H1N1 virus is thought to occur in the same way that seasonal flu spreads. The basic reproduction number (the average number of other individuals each infected individual will infect in a population that has no immunity to the disease) for the 2009 novel H1N1 is estimated to be 1.75.

The symptoms of swine flu are similar to other influenzas, and may include a fever, coughing (typically a "dry cough"), headaches, pain in the muscles or joints, sore throat, chills, fatigue, and runny nose. Diarrhea, vomiting, and neurological problems were also reported in some cases.

People at higher risk of serious complications include people age 65 and older, children younger than 5 years old, children with neurodevelopmental conditions, pregnant women, and people of any age with underlying medical conditions, such as asthma, diabetes, obesity, heart disease, or a weakened immune system. Most hospitalizations in the US were people with such underlying conditions, according to the CDC.

A New England Journal of Medicine article on hospitalized United States H1N1 patients from April to mid-June found that 40% of them had chest X-rays consistent with pneumonia. If the same pattern holds from the 1957-58 pandemic, then approximately two-thirds of these patients had viral pneumonia and one-third had bacterial pneumonia. However, antiviral medication was received by only 73% of the patients, whereas 97% received antibiotics. It is recommended that such patients receive both.

A study from Australia and New Zealand estimated that the demand for ICU beds due to viral pneumonia was much higher during the pandemic than in previous influenza seasons. A Canadian study reported that intensive care capacity in Winnipeg, Manitoba was "seriously challenged" at the peak of the outbreak, with full occupancy of all regional ICU beds. The average age of ICU patients was 32, 40, and 44 years in Canada, Australia/New Zealand, and Mexico respectively.

In adults, shortness of breath, pain in the chest or abdomen, sudden dizziness, or confusion may require emergency care.

In both children and adults, persistent vomiting or the return of flu-like symptoms that include a fever and cough may require medical attention. If it follows the same pattern as in children, a relapse with high fever may in fact be pneumonia.

As with the seasonal flu, certain symptoms may require emergency medical attention. In children, signs of respiratory distress include blue lips and skin, dehydration, rapid breathing, excessive sleeping, seizures, and significant irritability including a lack of desire to be held.

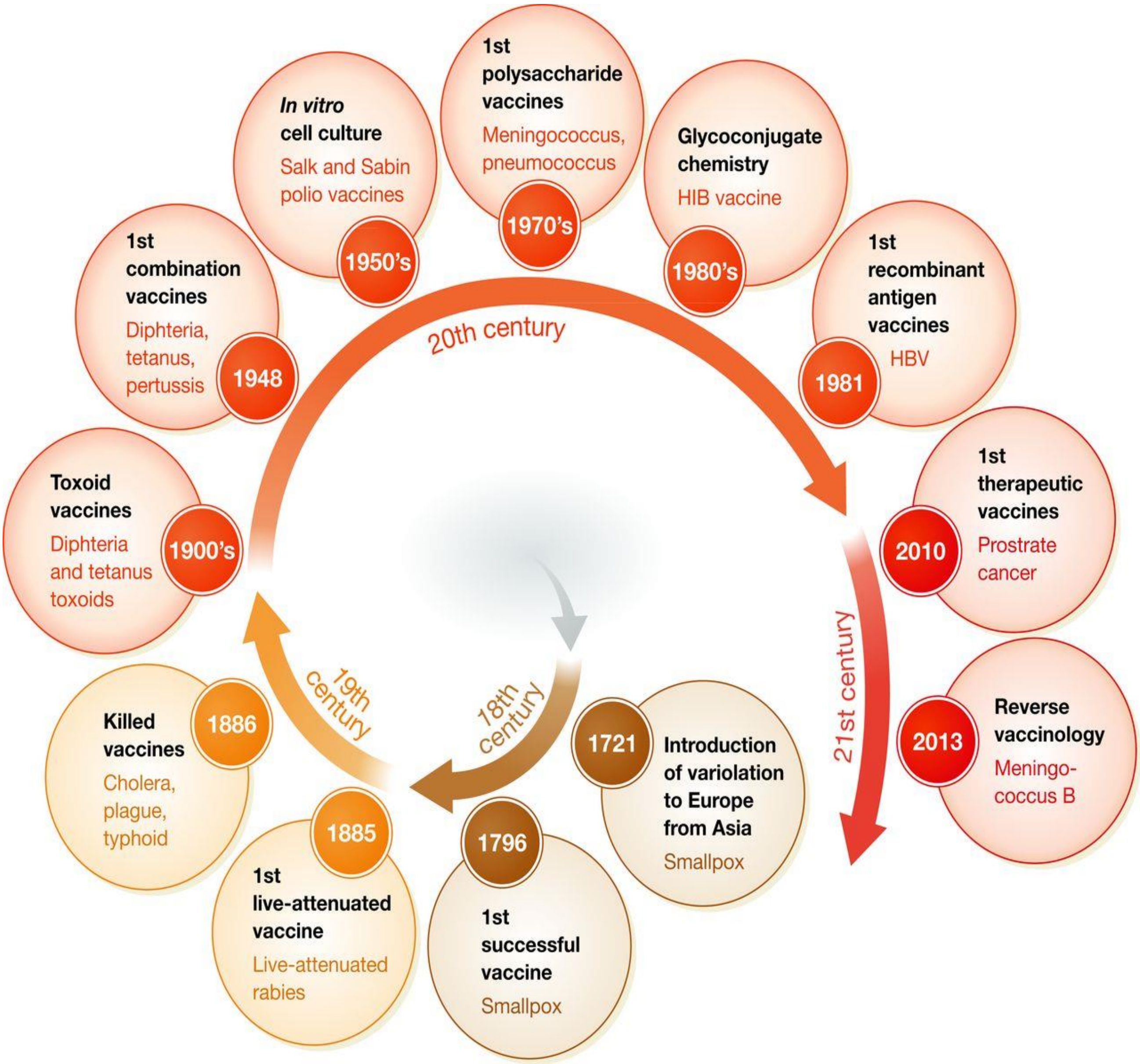
Although "too early" to tell for certain, Dr. Frieden has noted that so far the swine flu "seems to be taking a heavier toll among chronically ill children than the seasonal flu usually does."

Of the children who have died so far, nearly two-thirds had pre-existing nervous system disorders, such as cerebral palsy, muscular dystrophy, or developmental delays.

"Children with nerve and muscle problems may be at especially high risk for complications," the CDC report stated. In children without chronic health problems, it is a warning sign if they seem to recover from the flu but then relapse with a high fever, Dr. Frieden added.

The relapse may be bacterial pneumonia, which must be treated with antibiotics. Researchers in Australia and New Zealand have reaffirmed that infants under the age of 1 year have the highest risk of developing severe illness from swine flu.

Exercise 1. Describe virus characteristics.



METHODS OF VACCINATION & PREVENTION

The pandemic is expected to peak by mid-winter in the Northern hemisphere.

The CDC recommended that initial vaccine doses should go to priority groups such as pregnant women, people who live with or care for babies under six months old, children six months to four years old and health-care workers.

In the UK, the NHS recommended vaccine priority go to people over six months old who were clinically at risk for seasonal flu, pregnant women, and households of people with compromised immunity. Although it was initially thought that two injections would be required, clinical trials showed that the new vaccine protects adults "with only one dose instead of two", and so the limited vaccine supplies would go twice as far as had been predicted. Costs would also be lowered by having a "more efficient vaccine". For children under the age of 10, two administrations of the vaccine, spaced 21 days apart, are recommended. The seasonal flu will still require a separate vaccination.

Health officials worldwide were also concerned because the virus was new and could easily mutate and become more virulent, even though most flu symptoms were mild and lasted only a few days without treatment. Officials also urged communities, businesses and individuals to make contingency plans for possible school closures, multiple employee absences for illness, surges of patients in hospitals and other effects of potentially widespread outbreaks.

To combat the virus, the WHO and the US government geared up for a massive vaccination campaign in late 2009, one not seen since Jonas Salk discovered the polio vaccine in 1955.

The Mayo Clinic suggested personal measures to avoid seasonal flu infection were applicable to the 2009 pandemic: vaccination when available, thorough and frequent hand-washing, a balanced diet with fresh fruits and vegetables, whole grains, and lean protein, sufficient sleep, regular exercise, and avoiding crowds. Smoking raises the risk of contracting influenza, as well as producing more severe disease symptoms. The leading health agencies stressed that eating properly cooked pork or other food products derived from pigs would not cause flu.

Thermal imaging camera & screen, photo-graphed in an airport terminal in Greece. Thermal imaging can detect elevated body temperature, one of the signs of the virus. The WHO stated that countries should focus on mitigating the effect of the virus. It did not recommend closing borders or restricting travel. The Chinese government announced that visitors returning from flu-affected areas who experienced flu-like symptoms within two weeks would be quarantined.

On May 2, 2009, China suspended flights from Tijuana to Shanghai. The president of the Association of Flight Attendants told that all flight attendants should be given training in how to handle a person with flu and help in communicating to passengers the importance of keeping clean hands. She said that they need to be provided gloves and facemasks to deal with flu-stricken passengers.

Researchers add that airlines should also ensure that passenger cabins are always properly ventilated, including during flight delays in which passengers are kept aboard the plane. But he also adds that although the aviation industry in the US, along with the CDC, have tried to reassure passengers that air travel is safe, they have so far done too little to try to limit infection risks.

US airlines had made no major changes as of the beginning of June 2009, but continued standing practices that included looking for passengers with symptoms of flu, measles, or other infections, and relying on in-flight air filters to ensure that aircraft were sanitized. Masks were not generally provided by airlines and the CDC did not recommend that airline crews wear them.

Some non-US airlines, mostly Asian ones, including Singapore Airlines, China Eastern Airlines, China Southern Airlines, Cathay Pacific, and Mexicana Airlines, took measures such as stepping up cabin cleaning, installing state-of-the-art air filters, and allowing in-flight staff to wear face masks.

Exercise 1. Analyze the information, which is in the highlight, and use it in practice.

Exercise 2. Define methords of vaccination and prevention.

Exercise 3. Answer the questions.

1. When is the pandemic expected to peak? 2. What did the CDC recommend? 3. What did the NHS recommend in the UK? 3. What were health officials worldwide were concerned? 4. When did the WHO and the US government gear up to combat the virus? 5. What measures did some non-US airlines take?

Exercise 4. Read the article on closing of schools and summarize it.

The swine flu outbreak has led to numerous precautionary school closures in several countries. Rather than closing schools, the CDC recommended in August that students and school workers with flu symptoms should stay home for either seven days total, or until 24 hours after symptoms subside – whichever is longer.

The CDC also recommended that colleges should consider suspending fall 2009 classes if the virus begins to cause severe illness in a significantly larger share of students than last spring. They have additionally urged schools to suspend any rules, including penalizing late papers or missed classes, or requiring a doctor's note, to enforce "self-isolation" and prevent students from venturing out while ill; schools were advised to set aside a room for people developing flu-like symptoms while they wait to go home and that surgical masks be used for ill students or staff and those caring for them.

In California, school districts and universities are on alert and working with health officials to launch education campaigns. Many planned to stockpile medical supplies and discuss worst-case scenarios, including plans to provide lessons and meals for low-income children in case elementary and secondary schools close. University of California campuses were stockpiling supplies, from paper masks and hand sanitizer to food and water. To help prepare for contingencies, University of Maryland School of Medicine professor of pediatrics James C. King Jr. suggests that every county should create an "influenza action team" to be run by the local health department, parents, and school administrators.

US government officials are especially concerned about schools because the swine flu virus appears to disproportionately affect young and school-age people, between ages 6 months to 24 years of age, making them one of the top priority groups when it comes to the new vaccine.

Exercise 5. Explain the facts about pigs and food safety.

The novel H1N1 virus is a type of swine influenza, derived originally from a strain that lived in pigs and this origin gave rise to the common name of "swine flu". This term is widely used by mass media. Despite this origin, however, the strain was transmitted between people and not from swine.

The United States Secretary of Agriculture made clear that despite its common name being "swine flu", there is no risk of contracting flu from eating cooked pork products. The virus has been found in American and Canadian hogs, as well as in hogs in Northern Ireland, Argentina, and Norway.

On April 27, Azerbaijan imposed a ban on the importation of animal husbandry products from America. The Indonesian government halted the importation of pigs and initiated the examination of 9 million pigs in Indonesia. The Egyptian government ordered the slaughter of all pigs in Egypt on April, 2009. The initial outbreak was called the "H1N1 influenza". The CDC began referring to it as "Novel Influenza A (H1N1)".

In the Netherlands, it was originally called "Pig Flu", but is now called "New Influenza A (H1N1)" by the national health institute, although the media and general population use the name "Mexican Flu". South Korea and Israel briefly considered calling it the "Mexican virus". Later, the South Korean press used "SI", short for "swine influenza". Taiwan suggested the names "H1N1 flu" or "new flu", which most local media adopted. The World Organization for Animal Health proposed the name "North American influenza". The European Commission adopted the term "novel flu virus".

Exercise 6. Digest the score of the information briefly in English.

Exercise 7. Render the main idea of the information.

Exercise 8. Add some information & make up a small report and give a talk in class.

Exercise 9. Read the article and work your recommendations on using of facial masks.

The CDC does not recommend use of face masks or respirators in non-health care settings, such as schools, workplaces, or public places, with a few exceptions: people who are ill with the virus should consider wearing one when around other people, and people who are at risk for severe illness while caring for someone with the flu. There is general uncertainty among health professionals about the value of wearing either facial masks or more expensive respirators to prevent infection. Masks may benefit people in close contact with infected persons but it was unknown whether they prevent swine flu infection.

Exercise 10. Draw up some advices on quarantines.

Countries have begun quarantining or have threatened to quarantine foreign visitors suspected of having or being in contact with others who may have been infected.

In May, the Chinese government confined 21 US students and three teachers to their hotel rooms. As a result, the US State Department issued a travel alert about China's anti-flu measures and was warning travelers about traveling to China if ill.

In Hong Kong, an entire hotel was quarantined with 240 guests. Australia ordered a cruise ship with 2,000 passengers to stay at sea because of a swine flu threat. Egyptian Muslims who went on the annual pilgrimage to Mecca risked being quarantined upon their return. Russia and Taiwan said they would quarantine visitors from areas where the flu is present who have fevers. Japan quarantined 47 airline passengers in a hotel for a week in mid-May, then in mid-June India suggested pre-screening "outbound" passengers from countries thought to have a high rate of infection.

The Mayo Clinic and Medline listed ways to help ease symptoms, including adequate liquid intake and rest, soup to ease congestion, and over-the-counter drugs to relieve pain.

Aspirin was a very effective way to treat fever in adults, although in children and adolescents, aspirin is contraindicated due to the risk of Reye's syndrome. While over-the-counter drugs relieve symptoms, they do not kill the virus.

Most patients were expected to recover without medical attention, although those with pre-existing or underlying medical conditions were more prone to complications. According to the CDC, antiviral drugs could be given to treat those who become severely ill, two of which were recommended for swine flu symptoms. To be most useful, they were to be given within two days of showing symptoms and "may shorten the illness by a day or so," according to the Mayo Clinic.

To help avoid shortages of these drugs, the CDC recommended Tamiflu treatment primarily for people hospitalized with swine flu; people at risk of serious flu complications due to underlying medical conditions; and patients at risk of serious flu complications. The WHO likewise recommended that Tamiflu only be given to particularly vulnerable people and noted that healthy people who catch mild to moderate cases of swine flu did not need the drug at all.

The CDC warned that the indiscriminate use of antiviral medications to prevent and treat influenza could ease the way for drug-resistant strains to emerge which would make the fight against the pandemic that much harder. In addition, a British report found that people often failed to complete a full course of the drug, a behavior which encouraged resistance.

Both medications could have caused side effects, including lightheadedness, nausea, vomiting, loss of appetite, and trouble breathing, and it was recommended that patients discuss possible side effects with their doctor before starting antiviral medication. Children were reported to be at increased risk of self-injury and confusion after taking Tamiflu.

The WHO warned against buying antiviral medications from online sources, estimating that half the drugs sold by online pharmacies without a physical address are counterfeit. Due to the possible development of severe viral pneumonia, the WHO recommended early treatment with antiviral drugs for patients that meet the treatment criteria.

Exercise 11. Summarize your findings on prevention and issue in a short presentation.

A CRITICAL SYSTEMS APPROACH TO PUBLIC HEALTH

The traditional biomedical approach to disease is characterized by an effort to diagnostically isolate, study, and treat diseases as if they were distinct entities that existed in nature separate from other diseases and independent of the social contexts in which they are found.

This approach proved useful historically in focusing medical attention on the immediate causes and biological expressions of disease and contributed, as a result, to the emergence of targeted modern biomedical treatments for specific diseases, some of which have been enormously successful.

As the compendium of knowledge on diseases has advanced it has become increasingly clear that diseases do not usually exist in isolation from other diseases and health conditions, that synergistic disease interactions are of considerable importance to disease course and consequence, and that the social conditions of disease sufferers are critical to understanding the clustering and spread of disease, its expression in signs and symptoms, and its health impact at the individual and population levels. Hence, there is growing interest in the health sciences on syndemics.

Interest in the syndemics perspective has been driven by growing evidence of the regularity of interactions among diseases and recognition that this interaction influences disease course, expression, severity, transmission, and diffusion. Several different kinds of interaction among diseases have been described, including both indirect (changes caused by one disease that facilitate another) and direct interface (disease act in direct tandem). Another type of syndemic relationship involves one disease enhancing the virulence of another. There is evidence that herpesvirus has this effect on HIV infection, with progression to full-blown AIDS being significantly accelerated by co-infection with herpesvirus. Similarly, in gum infection, periodontal bacteria may enhance the virulence of herpesvirus. Alternately, one disease can assist the physical transmission of another disease.

This appears to be the case, for example, with syphilis and HIV coinfection as a result of genital-tract ulceration caused by the former supporting sexual transmission of the latter.

Direct interaction of diseases is in the case of gene mixing among different types of pathogenic agents, as has been described thus far in various plant and animal species. Genetic exchange by recombination of genomic segments is an important process in RNA virus evolution, resulting often in important phenotypic changes that allow changes in the spread and strength of viral infection. Gene mixing among completely different types of pathogenic agents has also been described.

The frequency of gene reassortment among human pathogens is less clear than is the case among plant or some animal species but of significant potential concern as animal diseases adapt to human hosts – which they have been doing at an increasingly rapid pace – and as new diseases come into contact. In some cases, co-infection may open up multiple syndemic pathways. In studies of human populations, a lethal synergism has been identified between influenza virus and pneumococcus, a likely cause of excess mortality from secondary bacterial pneumonia during influenza epidemics.

There is a significant level of evidence indicating that the influenza virus alters the lungs in ways that increase the adherence, invasion and induction of disease by pneumococcus. But other consequential changes, such as alteration of the immune response which weakens the body’s ability to clear pneumococcus (or, alternately, by amplifying the inflammatory cascade), are also suggested by existing research.

Exercise 1. Choose the keywords that best convey the gist of the information.

Exercise 2. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

SYNDEMIC

Syndemic refers to the concentration of two or more diseases or other health conditions in a population in which there is some level of biological interaction among the diseases and health conditions that magnifies the negative health effects of one or more of the co-present diseases or health conditions. The notion that there can be two or more co-occurring diseases is, of course, not new, and is referred to as comorbidity among other terms. The differences between "comorbid" and "syndemic", however, are not merely semantic.

As Mustanski explain: "comorbidity research tends to focus on the nosological issues of boundaries and overlap of diagnoses, while syndemic research focuses on communities experiencing co-occurring epidemics that additively increase negative health consequences".

Consequently, it is possible for two afflictions to be comorbid, but not represent a syndemic (i.e., the disorders are not epidemic in the studied population or their co-occurrence is not accompanied by increased adverse health consequences). Thus, two (or more) diseases can be comorbid but no interaction occurs between them, while in other cases interaction occurs but it has beneficial rather than deleterious consequences.

Syndemic theory seeks to draw attention to and provide a framework for the analysis of adverse disease interactions, including their causes and consequences for human life and well-being.

Notably, syndemics tend to develop under conditions of health disparity, caused by poverty, stress, or structural violence, and contribute to a significant burden of illness in affected populations.

The term "syndemics" is further reserved to label the consequential interactions between co-present or sequential diseases in a population and between these diseases and the social conditions that contribute to their clustering within the population.

The term "syndemic" was developed and introduced by Merrill Singer, a medical anthropologist, in several articles in the mid-1990s and has since received growing attention and use among epidemiologists and medical anthropologists concerned with community health and the effects of social conditions and social inequality on health. Discussion of deleterious disease interactions raises a question about the possibility of an opposite kind of disease interaction, namely: are there counter syndemics, disease interactions that lower the burden of disease in a population below the sum effects of the individual diseases involved?

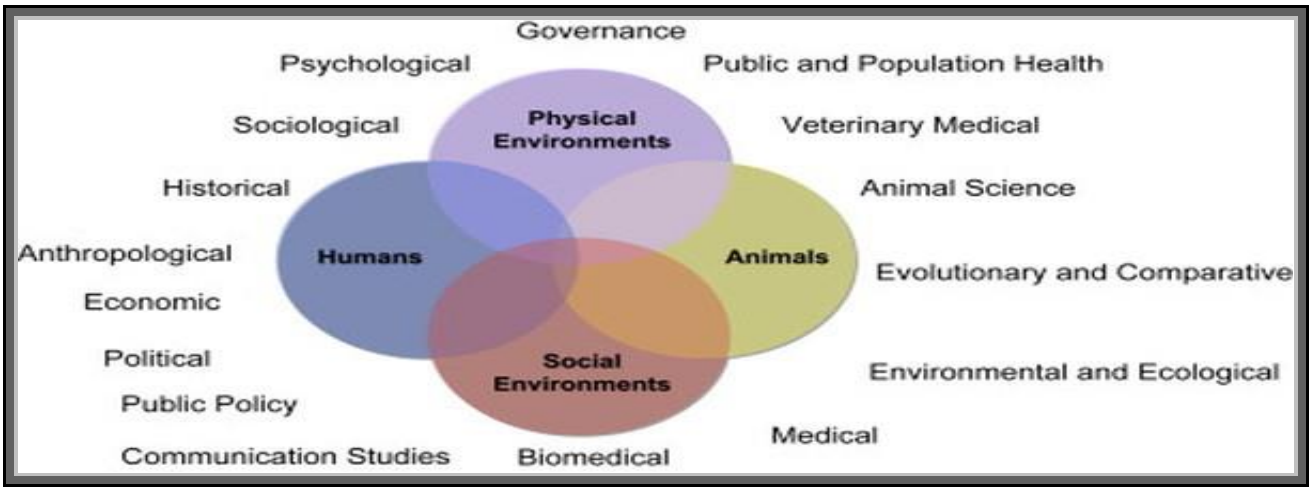
The discovery of counter-syndemics is important because such entities may suggest novel strategies for the prevention and treatment of disease. Recent research findings suggest that counter-syndemics do occur and are part of the complex world of co-morbidity.

William Moss and fellow researchers at the Johns Hopkins Bloomberg School of Public Health have found that human immunodeficiency virus is transiently suppressed during an acute measles infection. This finding was the product of a study of HIV-infected children living in Zambia. In the study, children who had measles, and reported various typical symptoms, including fever, rash, conjunctivitis, runny nose, and cough, had a significant drop in HIV levels detectable in the blood as compared to HIV-infected children who were not infected with measles. Several potential mechanisms could be responsible for the temporary suppression of HIV replication early in the course of a measles infection.

Exercise 1. Comment on the given details about syndemics.

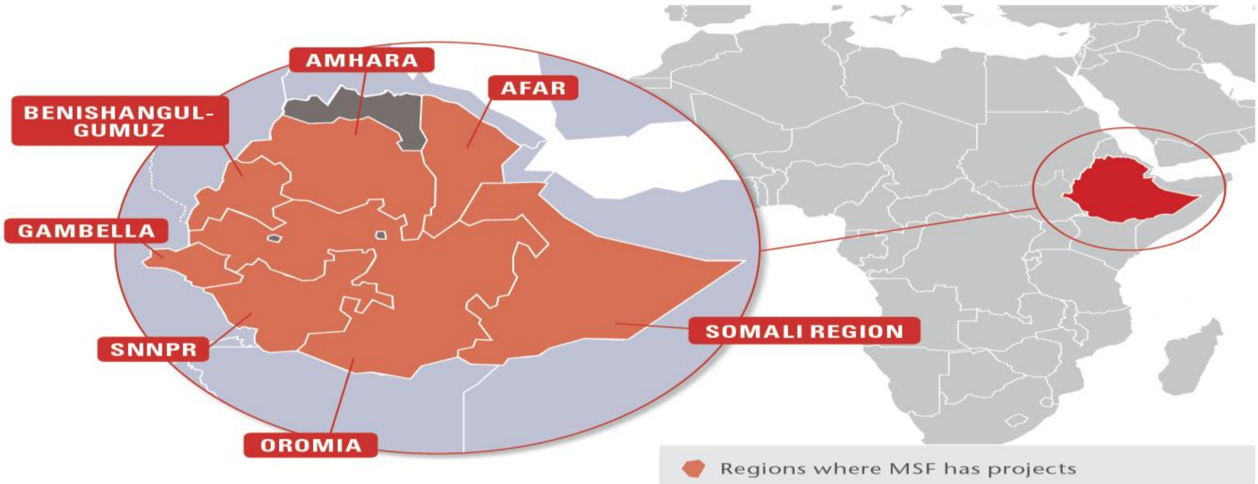
Exercise 2. Answer the questions.

1. What is syndemic like? 2. What is the difference between "comorbid" and "syndemic"? 3. What does Mustanski explain? 4. What does syndemic theory seek? 5. What do syndemics tend to develop? 6. What is the term *syndemics* further reserved to do? 7. Who developed and introduced the term "syndemic"? 8. What question does discussion of deleterious disease interactions raise? 9. Is the discovery of counter-syndemics important? Why? 10. What did William Moss and fellow researchers find? 11. What is responsible for the temporary suppression of HIV replication?



Exercise 3. Answer the questions.

1. What is the traditional biomedical approach to disease? 2. How can you define the disease? 3. How did this approach prove useful historically? 4. What became increasingly clear? Why? 5. Are the social conditions of disease sufferers critical to understanding the clustering and spread of disease? 6. How did Interest in the syndemics perspective drive? 7. What does another type of syndemic relationship involve? 8. Can one disease assist the physical transmission of another disease? 9. Is direct interaction of diseases in the case of gene mixing among different types of pathogenic agents? 10. Is genetic exchange by recombination of genomic segments an important process in RNA virus evolution? 11. When may co-infection open up multiple syndemic pathways? 12. What is a likely cause of excess mortality from secondary bacterial pneumonia during influenza epidemics? 13. Is there a significant level of evidence indicating that the influenza virus alters the lungs? 14. What was suggested the this research?



Exercise 4. Choose the keywords that best convey the gist of the information.

Exercise 5. Make up some dialogues from the information above.

Exercise 6. Write a small essay on the topic.

Exercise 7. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

INFLUENZA PANDEMICS

There were 3 influenza pandemics during the 20th century that caused widespread illness, mortality, social disruption, and significant economic losses. These occurred in 1918, 1957, and 1968.

In each case, mortality rates were determined primarily by five factors: the number of people who became infected, the virulence of the virus causing the pandemic, the speed of global spread, the underlying features and vulnerabilities of the most affected populations, and the effectiveness and timeliness of the prevention and treatment measures that were implemented. These factors unite a range of bio-social causal forces, including

- production, communication, and transportation technologies;
- the medical and public health infrastructures;
- the specific pathogens involved and the nature of their interactions with human hosts;
- the pre-existing health status of patients.

All of these, in turn, are shaped, to greater or somewhat lesser degree, by overarching political economic structures globally and locally. Epidemics, in short, including their emergence, course, and impact (and whether they become wide spread pandemics that exact a sorrowful toll on life and well-being) are sculpted by the configuration of human social relationships including prevailing patterns of social inequality. The 1957 pandemic was caused by the Asian influenza virus (known as the H2N2 strain), a novel influenza variety to which humans had not yet developed immunities.

The death toll of the 1957 pandemic is estimated to have been around two million globally, with approximately 70,000 deaths in the United States. A little over a decade later, the comparatively mild Hong Kong influenza pandemic erupted due to the spread of a virus strain (H3N2) that genetically was related to the more deadly form seen in 1957. The pandemic was responsible for about one million deaths around the world, almost 34,000 of which were in the United States.

In both of these pandemics, death may not have been due only to the primary viral infection, but also to secondary bacterial infections among influenza patients; in short, they were caused by a viral/bacterial syndemic. The worst of the 20 century influenza pandemics was the 1918 outbreak, which epidemiologists estimate was responsible for the deaths of between 40-100 million people worldwide, making it one of the most deadly events in human history. More people died of the so-called Spanish flu pandemic in the single year of 1918 than during all four-years of the Black Death scourge that lasted from 1347 to 1351 (although a significantly higher % age of the world's population died of the plague than of Spanish flu). It is estimated that between 20-40 % of the world's population became ill during the 1918 pandemic. The pandemic had devastating effects as disease spread along trade and shipping routes and other corridors of human movement until it had circled the globe. In places like India, the mortality rate reached 50 per 1,000 population. Arriving during the closing phase of the World War I, the pandemic had a significant impact on mobilized national armies. Half of U.S. soldiers who died in the "Great War" were victims of influenza not of enemy bombs and bullets. It is estimated that almost a¾ of a million Americans died during the pandemic. In part, the death toll during the pandemic was caused by viral pneumonia characterized by extensive bleeding in the lungs resulting in suffocation. Many victims died within 48 hours of the appearance of the first symptom. In fact, it was not uncommon for people who appeared to be quite healthy in the morning to have died by sunset.

Exercise 1. Read the text on the influenza syndemics and translate it in writing.

Exercise 2. Transfer the given information from the passages onto a table.

№	Activity			
	Event	When	Where	Score
1.				

Exercise 3. Analyze the intership between syndemics and the environment.

As a result of the floral changes produced by global warming, a significant escalation is occurring in global rates of allergies and asthma. Currently, allergic diseases constitute the sixth leading cause of chronic illness in the USA, impacting the lives of 17 % of the population.

Asthma, characterized by episodic inflammation and narrowing of small airway passages in the lungs, affects about 8 % of the U.S. population, but the rate of affected individuals has been steadily climbing in recent years, especially in low income, ethnic minority neighborhoods in cities.

Thus, in 1980 asthma was found to affect only about 3% of the U.S. population according to the U.S. Centers for Disease Control & Prevention. Asthma among children has been increasing at an even faster pace than among adults, with the % age of children with asthma going up from 3.6 % in 1980 to 9 % in 2005. Among ethnic minority populations, Puerto Ricans the rate of asthma is 125 % higher than non-Hispanic white people and 80 % higher than non-Hispanic black people.

The asthma prevalence among American Indians, Alaska Natives and black people is 25 % higher than white people. As is so often the case with health, including health conditions directly affected by global warming, the poor and marginalized suffer the gravest consequences.

Increases in rates of asthma have occurred despite improvements in air quality produced by the passage and enforcement of clean air legislation, such as both the Clean Air Act of 1963 and the Clean Air Act of 1990 in the USA. In other words, existing legislation and regulation have not kept pace with changing climatic conditions and their health consequences. Compounding the problem of air quality is the fact that air-borne pollens have been found to attach themselves to diesel particles from truck or other vehicular exhaust floating in the air, resulting in heightened rates of asthma in areas where busy roads bisect densely populated areas, most notably in poorer inner city areas.

Research by the American Cancer Society found that a six % increase in cardiopulmonary deaths occurs for every elevation of 10 in particulate matter concentration in the air.

Exhaust from the burning of diesel fuel is a complex mixture of vapors, gases, and fine particles, including over 40 known pollutants like nitrogen oxide and known or suspected carcinogenic substances such as benzene, arsenic, and formaldehyde. Exposure to diesel exhaust irritates the eyes, nose, throat and lungs, causing coughs, headaches, light headedness and nausea, while causing people with allergies to be more susceptible allergy triggers like dust or pollen.

Many particles in disease fuel are so tiny they are able to penetrate deep into the lungs when inhaled. Importantly, diesel fuel particles appear to have even greater immunologic effects in the presence of environmental allergens than they do alone. According Robert Pandya: "This immunologic evidence may help explain the epidemiologic studies indicating that children living along major trucking thoroughfares are at increased risk for asthmatic and allergic symptoms and are more likely to have objective evidence of respiratory dysfunction."

Importantly, the damaging effects of diesel fuel pollution appears to go significantly beyond playing a synergistic role in the development of asthma. Recent research suggests that exposure to a combination of microscopic diesel fuel particles among people with high blood cholesterol (i.e., low-density lipoprotein, LDL or "bad cholesterol") increases the risk for both heart attack and stroke significantly above levels found among those exposed to only one of these health risks.

Exercise 4. Read the information on future research on syndemics and try to understand.

Medical anthropologist, epidemiologists, and clinical researchers are just beginning to understand the nature of syndemics. There is a critical need for new research in this area. Important arenas of inquiry include the following: First, there is a need for studies that examine the processes by which syndemics emerge, including the specific sets of health and social conditions that foster the occurrence of multiple epidemics in a population and how syndemics function to produce specific kinds of health outcomes in populations.

Second, there is a need to better understand processes of interaction between specific diseases with each other and with health-related factors like malnutrition, structural violence, discrimination, stigmatization, and toxic environmental exposure that reflect oppressive social relationships.

Specifically, there is a need to identify all of the ways, directly and indirectly, that diseases can interact and have, as a result, enhanced impact on human health. Third there is a need for the development of an **eco-syndemic** understanding of the ways in which global warming is contributing to the spread of diseases to new areas and to the potential for new disease interactions.

Already it is clear that as a result of global warming infectious diseases such as West Nile Virus are spreading to new places. Similarly malaria is now found in new places because it is spread by particular mosquito species that are migrating to new locations as a result of changing climates.

As a consequence, diseases that did not often interact in the past – through co-infection of the same individuals within a population – may begin interacting more regularly.

Finally, there is a need for a better understanding of how the public health systems and communities can best respond to and limit the health consequences of syndemics.

Systems are needed to monitor the emergence of syndemics and to allow *early-bird* medical and public health responses designed to lessen their impact. Systematic ethno-epidemiological surveillance with populations subject to multiple social stressors must be one component of such a monitoring system. Current efforts by researchers at the CDC to expand the discussion of syndemics in public health discourse is an important step in the development of a funded research agenda that addresses these research needs. Given the nature of syndemics, this research requires a bio-cultural/social approach that attends to both clinical and social processes.

Exercise 5. Classificate the notion «bioterrorism».

A bioterrorism attack is the deliberate release of viruses, bacteria, or other germs (agents) used to cause illness or death in people, animals, or plants. These agents are typically found in nature, but it is possible that they could be changed to increase their ability to cause disease, make them resistant to current medicines, or to increase their ability to be spread into the environment.

Biological agents can be spread through the air, through water, or in food. Terrorists may use biological agents because they can be extremely difficult to detect and do not cause illness for several hours to several days. Some bioterrorism agents, like the smallpox virus, can be spread from person to person and some, like anthrax, cannot.

Bioterrorism is an attractive weapon because biological agents are relatively easy and inexpensive to obtain or produce, can be easily disseminated, and can cause widespread fear and panic beyond the actual physical damage they can cause.

HISTORY OF THE PHENOMINA

Military leaders have learned that, as a military asset, bioterrorism has some important limitations; it is difficult to employ a bioweapon in a way that only the enemy is affected and not friendly forces. A biological weapon is useful to terrorists mainly as a method of creating mass panic and disruption to a society. However, technologists such as Bill Joy have warned of the potential power which genetic engineering might place in the hands of future bio-terrorists. The use of agents that do not cause harm to humans but disrupt the economy have been discussed.

A highly relevant pathogen in this context is the foot-and-mouth disease (FMD) virus, which is capable of causing widespread economic damage and public concern (as witnessed in the 2001 and 2007 FMD outbreaks in the UK), whilst having almost no capacity to infect humans.

Biological terrorism dates as far back as ancient Roman civilization, when feces was thrown into faces of enemies. This early version of biological terrorism continued on into the 14^{th} century where the bubonic plague was used to infiltrate enemy cities, both by instilling the fear of infection in residences, in hopes that they would evacuate, and also to destroy defending forces that would not yield to the attack. The use of disease as a weapon in this stage of history exhibited a lack of control aggressors had over their own biological weapons. Primitive medical technology provided limited means of protection for the aggressor and a battle's surrounding geographical regions.

After the battle was won, the inability to contain enemies who escaped death led to widespread epidemics affecting not only the enemy forces, but also surrounding regions' inhabitants. Due to the use of these biological weapons, and the apparent lack of medical advancement necessary to defend surrounding regions from them, widespread epidemics such as the bubonic plague quickly moved across all of Europe, destroying a large portion of its population. The victims of biological terrorism in fact became weapons themselves. This was noted in the Middle Ages, but medical advancements had not progressed far enough to prevent the consequences of a weapons use.

Over time, biological warfare became more complex. Countries began to develop weapons which were much more effective, and much less likely to cause infection to the wrong party. One significant enhancement in biological weapon development was the first use of anthrax. Anthrax effectiveness was initially limited to victims of large dosages. This became a weapon of choice because it is easily transferred, has a high mortality rate, and could be easily obtained.

Variants of the anthrax bacterium can be found all around the world making it the biological weapon of choice in the early 19^{th} century. Another property of anthrax that helped fuel its use as a biological weapon is its poor ability to spread far beyond the targeted population.

By the time World War I began, attempts to use anthrax were directed at animal populations.

This was ineffective. Instead, the use of poisonous mustard gas became the biological weapon of choice. The sheer horror of its effects lead to a treaty called the Geneva Protocol of 1925.

The treaty was created to prevent the use of asphyxiating gas as a method of biological warfare. While this was a significant advancement toward the prevention of biological weapon use, the treaty said nothing about weapon development. Secretly, biological weapon development programs existed in many nations. While no documented instances of biological weapon use exist, it is believed that this was primarily due to the immaturity of the programs, and not the unwillingness to use them.

Following the start of World War I, Germany launched a biological sabotage campaign in the United States, Russia, Romania, and France. At that time, Anton Dilger lived in Germany, but in 1915 he was sent to the United States carrying cultures of glanders, a virulent disease of horses and mules.

Dilger set up a laboratory in his home in Chevy Chase, Maryland. He used stevedores working the docks in Baltimore to infect horses with glanders while they were waiting to be shipped to Britain.

Dilger was under suspicion as being a German agent, but was never arrested. Dilger eventually fled to Madrid, Spain, where he died during the Influenza Pandemic of 1918. In 1916, the Russians arrested a German agent with similar intentions.

Germany and its allies infected French cavalry horses and many of Russia's mules and horses on the Eastern Front. These actions hindered artillery and troop movements, as well as supply convoys. American biological weapon development began in 1942. President Franklin D. Roosevelt placed George W. Merck in charge of the effort to create a development program.

These programs continued until 1969, when by executive order President Richard Nixon shut down all programs related to American offensive use of biological weapons. Accusations of the use of biological weapons against North Korea were spread during the Vietnam war.

However it is believed hat those accusations were propaganda developed by the North Korean regime to villainize US Armed Forces. As the 1970s passed, global efforts to prevent the development of biological weapons and their use were widespread. In 1972 the prohibition of development, production and stockpiling biological weapons was developed. Americans allege that in the 1980's Iraq made substantial efforts to develop and stockpile large amounts of biological weapons.

By the end of the 80's Iraq allegedly had several sites dedicated to the research and development of biological warfare. The US accused Iraq of testing its findings in the late 80's.

The USA attacked Iraq precisely on this pretext though could not prove the existence of biological weapons or any WMDs in Iraq. Since that time, efforts to use biological warfare has been more apparent in small radical organizations attempting to create fear in the eyes of large groups.

Some efforts have been partially effective in creating fear, due to the lack of visibility associated with modern biological weapon use by small organizations.

1993 – Japan – Aum Shinrikyo anthrax release in Kameido. In June 1993 the religious group Aum Shinrikyo released Anthrax in Tokyo. Eye witnesses reported a foul odor. The attack was a total failure, infecting not a single person. This case shows how difficult it is to aerosolize Anthrax spores in high concentration.

1984 – USA – Rajneeshee bioterror attack. In 1984, followers of the Bhagwan Shree Rajneesh attempted to control a local election by incapacitating the local population. This was done by infecting salad bars in eleven restaurants, produce in grocery stores, doorknobs, and other public domains with Salmonella typhimurium bacteria in the city of The Dalles, Oregon. The attack infected 751 people with severe food poisoning. However, there were no fatalities. This incident was the first known bioterrorist attack in the United States in the 20th century.

2001 – USA – Anthrax Attacks. In September and October 2001, several cases of anthrax broke out in the United States in the 2001 anthrax attacks, caused deliberately. Letters laced with infectious anthrax were delivered to news media offices and the U.S Congress. The letters killed 5. Tests on the anthrax strain used in the attack pointed to a domestic source, possibly from the biological weapons program. Still the attacks provoked efforts to define biodefense and biosecurity, focused on unintentional or accidental impacts of agricultural and medical technologies.

Exercise 1. Analyze the history of the phenomina.

Exercise 2. Answer the questions.

1. When did biological terrorism date back? 2. What had happened by the time World War I? 3. When did American biological weapon development begin? 4. What are the stages of biological terrorism in 1960-1990s? 5. When did early version of biological terrorism continue on? 6. What did the use of disease as a weapon in this stage of history exhibit? 7. Primitive medical technology provided limited means of protection for the aggressor, didn't it? 8. Had medical advancements progressed far enough to prevent the consequences of a weapons use? 9. When were attempts to use anthrax directed at animal populations? 10. What led to a treaty called the Geneva Protocol of 1925? 11. Was the treaty created to prevent the use of asphyxiating gas as a method of biological warfare? 12. What country launched a biological sabotage campaign in the United States, Russia, Romania, and France? When was it? 13. When has efforts to use biological warfare been more apparent in small radical organizations? 14. Have any afforts been partially effective in creating fear?

GLOBALIZATION & DISEASES

Globalization, the flow of information, goods, capital and people across political and geographic boundaries, has also helped to spread some of the deadliest infectious diseases known to humans.

The spread of diseases across wide geographic scales has only increased through history.

In the current era of globalization the world is more interdependent than at any other time.

Efficient and inexpensive transportation has left few places inaccessible, and increased global trade in agricultural products has brought more and more people into contact with animal diseases that have subsequently jumped species barriers. It is believed that globalization began during the Age of Exploration. An increase in travel also helped spread diseases to natives of land who had not previously been exposed. When a native population is infected with a new disease, where no antibodies have been developed, the disease tends to run rampant within the population.

Etiology, the modern branch of science that deals with the causes of infectious disease, recognizes five major modes of disease transmission: airborne, waterborne, bloodborne, by direct contact, and through vector (insects or other creatures that carry germs from one species to another).

As humans began traveling over seas and across lands which were previously isolated research suggests that diseases have been spread by all five transmission modes.

The Age of Exploration generally refers to the period between the 15th and 17th centuries.

During this time technological advances in shipbuilding and navigation made it easier for nations to explore outside previous boundaries. Globalization has had many benefits new products to Europeans were discovered such as tea, silk and sugar when Europeans developed new trade routes around Africa to India and the Spice Islands, Asia, and eventually running into the Americas.

In addition to trading in goods, many nations began to trade in slavery. Trading in slaves helped to introduce new diseases to new locations.

During this time, different societies began to integrate, increasing the concentration of humans and animals in one place, and led to the emergence of new diseases. During this time sorcerers' and witch doctors' treatment of disease was often focused on magic and religion, and healing the entire body and soul, rather than focusing on a few symptoms like modern medicine. Early medicine often included the use of herbs, and meditation, and sometimes even trephining.

Severe diseases were often thought of as supernatural or magical. As a result, the destruction of the native peoples are more attributable to germs than to gunpowder. Over a period of four centuries, epidemic diseases wiped out as much as 90 % of the American indigenous populations.

In Europe during the age of exploration, diseases such as smallpox and tuberculosis had been around for centuries and people had developed antibodies to these and other diseases. When the Europeans traveled to new lands they carried these diseases with them.

When these diseases were introduced for the first time to new populations of humans the effects on the native populations were widespread and deadly. The Columbian Exchange, referring to Christopher Columbus's first contact with the native peoples of the Caribbean, began the trade of animals, and plants, and unwittingly began an exchange of diseases. Humans began to recognize the fact that germs and microbes exist in the 1800’s. Although, many scientists had ideas about germs through history, it wasn’t until Louis Pasteur spread his theory about germs.

Exercise 1. Explain the intership between globalization and diseases.

Exercise 2. Explain English notions in Russian.

Globalization – the process enabling financial and investment markets to operate internationally, largely as a result of deregulation and improved communications; the emergence since the 1980s of a single world market dominated by multinational companies, leading to a diminishing capacity for national governments to control their economies; the process by which a company, etc., expands to operate internationally.

To globalize – to put into effect or spread worldwide.

Global village – the whole world considered as being closely connected by modern telecommunications and as being interdependent economically, socially, and politically.

global disarmament – всеобщее разоружение

global war – мировая война

global network – всемирная сеть

global market – мировой рынок

global changes – перемены, носящие глобальный характер

to take a global view of smth. – смотреть на что-л. со всех точек зрения

Global Affairs – глобальные дела (проблемы)

Exercise 3. Review effects of globalization on disease in the modern world.

Modern modes of transportation allow more people and products to travel around the world at a faster pace, they also open the airways to the transcontinental movement of infectious disease vectors. One example of this occurring is West Nile Virus. It is believed that this disease reached the USA via "mosquitoes that crossed the ocean by riding in airplane wheel wells and arrived in New York City in 1999". With the use of air travel, people are able to go to foreign lands, contract a disease and not have any symptoms of illness until they get home, having exposed others to the disease along the way. As medicine has progressed, many vaccines and cures have been developed for some of the worst diseases (plague, syphilis, typhus, cholera, malaria) the world has encountered.

However, because the evolution of disease organisms is very rapid, even with vaccines we have difficulty providing full immunity to many diseases, and finding vaccines at all for some diseases remains extremely difficult. Without vaccines our global world remains vulnerable to infectious diseases. Evolution of disease presents a major threat in modern times.

Exercise 4. Give the explanation of the notion «transmission».

In medicine, **transmission** is the passing of a disease from an infected individual or group to a previously uninfected individual or group. The microorganisms (bacteria and viruses) that cause disease may be transmitted from one person to another by one or more of the following means:

- droplet contact – coughing or sneezing on another person
- direct physical contact – touching an infected person, including sexual contact
- indirect contact – usually by touching soil contamination or a contaminated surface
- airborne transmission – if the microorganism can remain in the air for long periods
- fecal-oral transmission – usually from contaminated food or water sources
- vector borne transmission – carried by insects or other animals

Microorganisms vary widely in the length of time that they can survive outside the human body, and so vary in how they are transmitted. Disease can be transmitted in two ways:

- *Horizontal disease transmission* – from one individual to another in the same generation (peers in the same age group). Horizontal transmission can occur by either direct contact (licking, touching, biting), or indirect contact (vectors or fomites that allow the transmission of disease without physical contact.
- *Vertical disease transmission* – passing a disease causing agent vertically from parent to offspring. Typically the mother transmits the disease by means of bodily fluid, and sometimes breast milk. In order to survive, microorganisms must have a way to be transmitted from one host to another.

Infectious agents are generally specialized for a particular method of transmission.

Taking an example from the respiratory route, from an evolutionary perspective a virus or bacteria that causes its host to develop coughing and sneezing symptoms has a great survival advantage – it is much more likely to be ejected from one host and carried to another. This is also the reason that many microorganisms cause diarrhea.

ENCLOSURES

MEDICAL SPECIALTIES

Following are some selected fields of medical specialties that don't directly fit into any of the above mentioned groups.

- Ophthalmology exclusively concerned with the eye and ocular adnexa, combining conservative and surgical therapy.
- Dermatology is concerned with the skin and its diseases. In the UK, dermatology is a subspecialty of general medicine.
- Emergency medicine is concerned with the diagnosis and treatment of acute or life-threatening conditions, including trauma, surgical, medical, pediatric, and psychiatric emergencies.
- Obstetrics and gynecology (often abbreviated as OB/GYN (American English) or Obs & Gynae (British English)) are concerned respectively with childbirth and the female reproductive and associated organs. Reproductive medicine and fertility medicine are generally practiced by gynecological specialists.
- Palliative care is a relatively modern branch of clinical medicine that deals with pain and symptom relief and emotional support in patients with terminal illnesses including cancer and heart failure.
- Pediatrics (AE) or paediatrics (BE) is devoted to the care of infants, children, and adolescents. Like internal medicine, there are many pediatric subspecialties for specific age ranges, organ systems, disease classes, and sites of care delivery.
- Physical medicine and rehabilitation (physiatry) is concerned with functional improvement after injury, illness, or congenital disorders.
- Psychiatry is the branch of medicine concerned with the bio-psycho-social study of the etiology, diagnosis, treatment and prevention of cognitive, perceptual, emotional and behavioral disorders. Related non-medical fields include psychotherapy and clinical psychology.

Interdisciplinary fields

Interdisciplinary sub-specialties of medicine are:

- General practice, family practice, family medicine or primary care is, in many countries, the first port-of-call for patients with non-emergency medical problems.
- Many other health science fields, e.g. dietetics
- Bioethics is a field of study which concerns the relationship between biology, science, medicine and ethics, philosophy and theology.
- Biomedical Engineering is a field dealing with the application of engineering principles to medical practice.
- Clinical pharmacology is concerned with how systems of therapeutics interact with patients.
- Conservation medicine studies the relationship between human and animal health, and environmental conditions. Also known as ecological medicine, environmental medicine, or medical geology.
- Disaster medicine deals with medical aspects of emergency preparedness, disaster mitigation and management.
- Diving medicine (or hyperbaric medicine) is the prevention and treatment of diving-related problems.
- Evolutionary medicine is a perspective on medicine derived through applying evolutionary theory.
- Forensic medicine deals with medical questions in legal context, such as determination of the time and cause of death.
- Gender-based medicine studies the biological and physiological differences between the human sexes and how that affects differences in disease.
- Hospital medicine is the general medical care of hospitalized patients. Physicians whose primary professional focus is hospital medicine are called hospitalists in the USA.
- Laser medicine involves the use of lasers in the diagnostics and/or treatment of various conditions.
- Medical humanities includes the humanities (literature, philosophy, ethics, history and religion), social science (anthropology, cultural studies, psychology, sociology), and the arts (literature, theater, film, and visual arts) and their application to medical education and practice.
- Medical informatics, medical computer science, medical information and eHealth are relatively recent fields that deal with the application of computers and information technology to medicine.

- Nosology is the classification of diseases for various purposes.
- Nosokinetics is the science/subject of measuring and modelling the process of care in health and social care systems.
- Pain management (called pain medicine) is the medical discipline concerned with the relief of pain.
- Preventive medicine is the branch of medicine concerned with preventing disease.
  - Community health or public health is an aspect of health services concerned with threats to the overall health of a community based on population health analysis.
  - Occupational medicine's principal role is the provision of health advice to organizations and individuals to ensure that the highest standards of health and safety at work can be achieved and maintained.
  - Aerospace medicine deals with medical problems related to flying and space travel.
- Osteopathic medicine, a branch of the U.S. medical profession.
- Pharmacogenomics is a form of individualized medicine.
- Sports medicine deals with the treatment and preventive care of athletes, amateur and professional. The team includes specialty physicians and surgeons, athletic trainers, physical therapists, coaches, other personnel, and, of course, the athlete.
- Therapeutics is the field, more commonly referenced in earlier periods of history, of the various remedies that can be used to treat disease and promote health.
- Travel medicine or emporiatrics deals with health problems of international travelers or travelers across highly different environments.
- Urgent care focuses on delivery of unscheduled, walk-in care outside of the hospital emergency department for injuries and illnesses that are not severe enough to require care in an emergency department. In some jurisdictions this function is combined with the emergency room.
- Veterinary medicine; veterinarians apply similar techniques as physicians to the care of animals.
- Wilderness medicine entails the practice of medicine in the wild, where conventional medical facilities may not be available.

TIME LINE

1812 – Napoleonic wars give rise to the military medical practice of triage in an effort to sort wounded soldiers in those to receive medical treatment and return to battle and those whose injuries are non-survivable. Dominique-Jean Larrey, a surgeon in the French emperor's army, not only conceived of taking care of the wounded on the battlefield, he also created the concept of ambulances, collecting the wounded in horse-drawn wagons and taking them to military hospitals.

1863 – International Red Cross founded in Geneva, Switzerland.

1873 – Clara Barton organizes the American Red Cross during the American Civil War.

1937 – President Franklin Roosevelt makes a public request by commercial radio for medical aid following a natural gas explosion in New London, Texas. This is the first presidential request for disaster medical assistance in United States history.

1955 – Col. Karl H. Houghton, M.D. addresses a convention of military surgeons and introduces the concept of disaster medicine.

1959 – Col. Joseph R. Schaeffer, M.D. reflecting the growing national concern over nuclear attacks on the United States civilian population initiates training for civilian physicians in the treatment of mass casualties for the effects of weapons of mass destruction creating the concept of medical surge capacity.

1961 – The American Medical Association, the American Hospital Association, the American College of Surgeons, the United States Public Health Service, the United States Office of Civil Defense and the Department of Health, Education and Welfare join Dr. Schaeffer in advancing civilian physician training for mass casualty and weapons of mass destruction treatment.

1962 – The North Atlantic Treaty Organization (NATO) publishes an official disaster medicine manual edited by Dr. Schaeffer.

1984 – The United States Public Health Service forms the first federal disaster medical response team in Washington, DC designated PHS-1

1986 – The United States Public Health System creates the National Disaster Medical System (NDMS) to provide disaster healthcare through National Medical Response Teams (NMRT), Disaster Medical Assistance Teams (DMAT), Disaster Veterinary Assistance Teams (VMAT) and Disaster Mortuary Operational Response Teams (DMORT). PH-1 becomes the first DMAT team.

1986 – A disaster medical response discussion group is created by NDMS team members and emergency medicine organizations in the United States. Healthcare professionals worldwide join the discussion group of the years to come.

1989 – The University of New Mexico creates the Center for Disaster Medicine, the first such medical center of excellence in the United States. Elsewhere in the world, similar centers are created at universities in London, Paris, Brussels and Bordeaux.

1992 – Hurricane Andrew, a category 5 hurricane strikes south Florida destroying the city of Homestead, Florida and initiation the largest disaster healthcare response to date.

1993 – On February 26, 1993 at 12:17 PM, a terrorist attack on the North Tower of the World Trade Center (the such attack on United States soil since World War II) increases interest in specialized education on the training disaster response for civilian physicians.

1998 – The American College of Contingency Planners (ACCP) is formed by the American Academy of Medical Administrators (AAMA) to provide certification and scholarly study in the area of medical contingency planning and healthcare disaster planning.

2001 – The September 11, 2001 attacks on the World Trade Center and the Pentagon is the largest loss of life resulting from an attack on American targets on United States soil since Peril Harbor. As a result, the need for disaster medicine is galvanized.

2001 – On October 29, 2001, President George W. Bush issues Homeland Security Presidential Directive 1 (HSPD-1) establishing the organization and operation of the Homeland Security Council.

2002 – On March 11, 2002, President Bush issues HSPD-3 establishing the Homeland Security Advisory System.

2002 – On December 11, 2002, President Bush issues HSPD-4 outlining the National Strategy to Combat Weapons of Mass Destruction

2003 – The American Medical Association in conjunction with the Medical College of Georgia and the University of Texas debut the National Disaster Life Support (NDLS) training program providing the first national certification in disaster medicine skills and education. NDLS training would later be referred to as the CPR of the 21st century.

2003 – In February, 2003 the American Association of Physician Specialists (AAPS) appoints an expert panel to explore the question of whether Disaster Medicine qualifies as a medical specialty.

2003 – On February 28, 2003, President Bush issues HSPD-5 outlining the system for management of domestic incidents (man-made and natural disasters). HSPD-5 mandated the creation and adoption of the National Response Plan (NRP).

2003 – On September 30, 2003, the National Response Plan was published and adopted by all Federal agencies.

2003 – On December 17, 2003, President Bush issues HSPD-8 outlining the new framework for national preparedness and creating the National Incident Management System (NIMS).

2004 – In February, 2004 the AAPS reports to the American Board of Physician Specialties (ABPS) that the expert panel, supported by the available literature and recent HSPD's has determined that there is a sufficient body of unique knowledge in Disaster Medicine to designate the field as a discrete specialty. ABPS empanels a board of certification to determine if board certification is appropriate in this new specialty.

2004 – On April 28, 2004, President Bush issues HSPD-10, also known as the plan for Biodefense for the 21st Century which calls for healthcare to implement surveillance and response capabilities to combat the treat of terrorism.

2004 – Hurricanes Charlie, Francis, Ivan and Jeanne batter the state of Florida resulting in the largest disaster medical response since Hurricane Andrew.

2005 – Hurricane Katrina batters the gulf coast of the United States destroying multiple coastal cities. For the first time in NDMS history, the entire NDMS system is deployed for a single disaster medical response. Among the many lessons learned in field operations following hurricane Katrina are the need for cellular autonomy under a central incident command structure and the creation of continuous integrated triage for the management of massive patient surge. The lessons learned in the hurricane Katrina response would be applied less than a month later following hurricane Rita and again following hurricane Wilma and the Indonesian tsunami.

2005 – In late October, 2005, the American Board of Disaster Medicine (ABODM) and the American Academy of Disaster Medicine (AADM) were formed for scholarly study, discussion and exchange in the field of disaster medicine as well as to oversee board certification in disaster medicine.

2006 – In June 2006, the Institute of Medicine published three reports on the state of emergency healthcare in the United States. Among the condemnations of emergency care is the lack of substantial improvement in disaster preparedness or cross silo coordination.

2006 – On September 17, 2006, the NIMS Integration Center publishes the NIMS Implementation Plan for Hospitals and Healthcare establishing a September 30, 2007 deadline for all hospitals and healthcare facilities to be NIMS compliant.

2007 – On January 31, 2007, President Bush issues HSPD-18 calling for the development and deployment of medical countermeasures against weapons of mass destruction.

2007 – On September 30, 2007, the NIMS Implementation Plan for Hospitals and Healthcare Facilities compliance deadline passes with fewer than 9% of all United States hospitals fully compliant and fewer than half of hospitals and healthcare facilities having made substantial progress towards compliance.

2007 – On October 18, 2007, President Bush issues HSPD-21 outlining an augmented plan for public health and disaster medical preparedness. HSPD-21 specifically calls for the creation of the discipline of disaster healthcare using the accepted definition of disaster medicine. HSPD-21 also calls on the Secretary of Health and Human Services (HHS) to use economic incentives including the Center for Medicare Services (CMS) to induce private medical organizations, hospitals and healthcare facilities to implement disaster healthcare programs and medical disaster preparedness programs.

MEDICAL INVENTIONS

7000 B.C.–1000 A.D.

- c. 7000 drill and bow drill, in Mehrgarh
- c. 7000 BC, dental drill, in Mehrgarh
- c. 7000 BC, surgery and dental surgery, in Mehrgarh
- c. 2600 BC, surgical suture, by Imhotep
- c. 2600 BC, pharmaceutical cream, by Imhotep
- c. 500 BC, cosmetic surgery, by Sushruta
- c. 500 BC, plastic surgery, by Sushruta
- c. 400 BC, Hippocratic bench, by Hippocrates
- c. 750 AD, inoculation and variolation, by Madhav
- c. 1000, cataract extraction and hypodermic needle, by Ammar ibn Ali al-Mawsili
- c. 1000, injection and syringe, by Ammar ibn Ali al-Mawsili
- c. 1000, adhesive bandage and plaster, by Abu al-Qasim al-Zahrawi
- c. 1000, cotton dressing and bandage, by Abu al-Qasim al-Zahrawi
- c. 1000, catgut, by Abu al-Qasim al-Zahrawi
- c. 1000, curette, by Abu al-Qasim al-Zahrawi
- c. 1000, forceps, by Abu al-Qasim al-Zahrawi
- c. 1000, ligature, by Abu al-Qasim al-Zahrawi
- c. 1000, retractor, by Abu al-Qasim al-Zahrawi
- c. 1000, scalpel, by Abu al-Qasim al-Zahrawi
- c. 1000, sound, by Abu al-Qasim al-Zahrawi
- c. 1000, surgical hook, by Abu al-Qasim al-Zahrawi
- c. 1000, surgical needle, by Abu al-Qasim al-Zahrawi

- c. 1000, surgical rod, by Abu al-Qasim al-Zahrawi
- c. 1000, surgical spoon, by Abu al-Qasim al-Zahrawi

1000 – present

- c. 1025, thermometer, by Avicenna (Ibn Sina)
- c. 1025, steam distillation, by Avicenna
- c. 1025, essential oil, by Avicenna
- c. 1150, inhalational anaesthetic, by Ibn Zuhr (Avenzoar)
- c. 1280, spectacles, in Italy
- 1540, artificial limb, by Ambroise Paré
- 1714, mercury thermometer, by Gabriel Fahrenheit
- 1792, ambulance, by Jean Dominique Larrey
- 1796, vaccination, by Edward Jenner
- 1816, stethoscope, by René Laennec
- 1817, dental plate, by Anthony Plantson
- 1827, endoscope, by Pierre Segalas
- 1846, general anaesthetic, by James Simpson
- 1851, ophthalmoscope, by Hermann von Helmholtz
- 1853, hypodermic syringe, by Alexander Wood
- 1865, antiseptic, by Joseph Lister
- 1885, rabies vaccination, chicken cholera vaccination by Louis Pasteur
- 1887, contact lens, by Adolf Fick
- 1895, X-ray, by Wilhelm Roentgen
- 1903, electrocardiograph, by Willem Einthoven
- 1905, sphygmomanometer by Nikolai Korotkov
- 1928, penicillin, by Alexander Fleming
- 1931, electron microscope by Ernst Ruska
- 1938, penicillin as an antibiotic, by Howard Florey and Ernst Chain
- 1957, artificial pacemaker, by Clarence Lillehei and Earl Bakken
- 1967, heart transplant, by Christian Barnard
- 1970, MRI and fMRI, by Paul Lauterbur and Peter Mansfield
- 1973, CAT scan, by Godfrey Hounsfield and Allan Cormack
- 1979, ultrasound scan, by Ian Donald
- 1982, artificial heart, by Robert Jarvik

Special history of medicine

- History of abortion
- History of alternative medicine
- History of anatomy
- History of brain imaging
- History of cancer chemotherapy
- History of cardiology
- History of condoms
- History of invasive and interventional cardiology
- History of endocrinology
- History of immunology
- History of intersex surgery
- History of internal medicine
- History of legal medicine
- History of microbiology
- History of mental illness
- History of neurology
- History of ophthalmology
- History of oto-rhino-laryngology
- History of pharmacology
- History of physiology
- History of psychiatry
- History of surgery
- History of traditional Chinese medicine
- History of veterinary medicine
- History of Islamic medieval ophthalmology
- Timeline of sexual orientation and medicine
- Timeline in Psychiatry

Museums & collections of health and medicine

- The London Museums of Health & Medicine
- Osler Library of the History of Medicine
- National Library of Medicine
- Thackray Museum Leeds, in a former workhouse of St James Hospital
- Wellcome Library History of Medicine
- The Center for the History of Medicine, Countway Library, Harvard Medical School (includes the Warren Anatomical Museum) in Boston, Massachusetts
- The Leprosy Museum in Bergen, Norway
- The Pavia Museum of History of Medicine

TIMELINE OF MEDICINE & MEDICAL TECHNOLOGY

Antiquity

- c. 2600s BC - Imhotep wrote texts on ancient Egyptian medicine describing diagnosis and treatment of 200 diseases in 3rd dynasty Egypt.
- c. 2596 BC[1] - The legendary date of composition of *Huangdi Neijing* (*Yellow Emperor's Classic of Internal Medicine*), which lays the framework for the basic theories of traditional Chinese medicine
- c. 1500 BC[1] - Saffron used as a medicine on the Aegean island of Thera in ancient Greece
- c. 500 BC[1] - Sushruta wrote Sushruta Samhita describing over 120 surgical instruments, 300 surgical procedures, classified human surgery in 8 categories and described cosmetic surgery in the Ayurvedic text
- c. 500 BC - Bian Que becomes the earliest physician known to use acupuncture and pulse diagnosis.
- 420 BC - Hippocrates of Cos maintains that diseases have natural causes and puts forth the Hippocratic Oath, marking the birth of medicine in the west.
- 300 BC - Charaka writes the Ayurvedic text *Charaka Samhita* which uses a rational approach to the causes and cure of disease and uses objective methods of clinical examination.
- 280 BC - Herophilus studies the nervous system and distinguishes between sensory and motor nerves
- 250 BC - Erasistratus studies the brain and distinguishes between the cerebrum and cerebellum
- 50-70 - Pedanius Dioscorides writes *De Materia Medica* - a precursor of modern pharmacopeias that was in use for almost 1600 years
- 180 - Galen studies the connection between paralysis and severance of the spinal cord
- 220 - Zhang Zhongjing publishes Shang Han Lun (On Cold Disease Damage), the oldest complete medical textbook in the world, focusing on diagnosis, treatment and prognosis.
- 215-282 - Life of Huangfu Mi, who wrote the Zhenjiu Jiayijing (The ABC Compendium of Acupuncture), the first textbook focusing solely on acupuncture.

Middle Ages

- 750 - Madhav writes the Ayurvedic text Nidana and lists diseases along with their causes, symptoms, complications.
- c. 800-873 - Al-Kindi (Alkindus) introduces quantification into medicine with his *De Gradibus*
- c. 830-870 - Hunayn ibn Ishaq translates Galen's works into Arabic
- c. 838-870 - Ali ibn Sahl Rabban al-Tabari, a pioneer of pediatrics and the field of child development, writes the first encyclopedia of medicine.
- c. 865-925 - Rhazes pioneers pediatrics, makes the first clear distinction between smallpox and measles. He also writes the *Doubts about Galen*, where he refutes Galen's theory of humorism using an experiment.
- 1000 - Abulcasis establishes surgery as a profession of in his *Kitab al-Tasrif*, which remains a standard textbook in Muslim and European universities until the 16th century. The book first introduced the plaster, inhalant anesthesia, and many surgical instruments, including the first instruments unique to women, as well as the surgical uses of catgut and forceps, the ligature, surgical needle, scalpel, curette, retractor, surgical spoon, sound, surgical hook, surgical rod, specula, and bone saw.
- 1021 - Alhazen completes his *Book of Optics*, which made important advances in ophthalmology and eye surgery, as it correctly explained the process of visual perception for the first time.
- c. 1030 - Avicenna writes *The Book of Healing* and *The Canon of Medicine*, in which he establishes experimental medicine and evidence-based medicine. The *Canon* remains a standard textbook in Muslim and European universities until the 18th century.

The book's contributions to medicine includes the introduction of clinical trials, systematic experimentation and quantification in medicine and physiology, the discovery of contagious diseases, the distinction of mediastinitis from pleurisy, the contagious nature of phthisis, the distribution of diseases by water and soil, and the first careful descriptions of skin troubles, sexually transmitted diseases, perversions, and nervous ailments, as well the use of ice to treat fevers, and the separation of medicine from pharmacology, which was important to the development of the pharmaceutical sciences.

- 1100-1161 - Avenzoar invents the surgical procedure of tracheotomy in al-Andalus. He is also the first physician known to have carried out human dissections and postmortem autopsy, and proves that the skin disease scabies is caused by a parasite, which contradicted the erroneous theory of humorism. He was also the first to provide a real scientific etiology for the inflammatory diseases of the ear, and the first to clearly discuss the causes of stridor. Modern anesthesia was also developed in al-Andalus by the Muslim anesthesiologists Ibn Zuhr and Abulcasis. They were the first to utilize oral as well as inhalant anesthetics, and they performed hundreds of surgeries under inhalant anesthesia with the use of narcotic-soaked sponges which were placed over the face.
- 1242 - Ibn an-Nafis suggests that the right and left ventricles of the heart are separate and discovers the pulmonary circulation (the cycle involving the ventricles of the heart and the lungs) and coronary circulation, for which he is considered the pioneer of circulation theory and one of the greatest physiologists. He emphasized the rigours of verification by measurement, observation and experiment, and was an early proponent of experimental medicine, postmortem autopsy, and human dissection. He also discredited many other erroneous Avicennian and Galenic doctrines on the four humours, pulse bones, muscles, intestines, sensory organs, bilious canals, esophagus, stomach, and the anatomy of other parts of the human body. Ibn al-Nafis also drew diagrams to illustrate different body parts in his new physiological system.
- c. 1248 - Ibn al-Baitar wrote on botany and pharmacy, studied animal anatomy and medicine, and was a pioneer of veterinary medicine.
- 1249 - Roger Bacon writes about convex lens spectacles for treating long-sightedness
- 1300s - When the Black Death bubonic plague reached al-Andalus, Ibn Khatima hypothesized that infectious diseases are caused by microorganisms which enter the human body.
- 1313-1374 - Ibn Khatima wrote a treatise called *On the Plague*, in which he establishes the existence of contagion through "experience, investigation, the evidence of the senses and trustworthy reports." He also discovers that "transmission is affected through garments, vessels and earrings."
- 1403 - concave lens spectacles to treat myopia
- early 16th century: Paracelsus, an alchemist by trade, rejects occultism and pioneers the use of chemicals and minerals in medicine

1500 - 1800

- 1543 - Andreas Vesalius publishes De Fabrica Corporis Humani which corrects Greek medical errors and revolutionizes European medicine
- 1546 - Girolamo Fracastoro proposes that epidemic diseases are caused by transferable seedlike entities
- 1553 - Spanish physician Miguel Serveto describes the circulation of blood through the lungs and is accused of heresy by Catholics and Protestants alike; burned at the stake for heresy the same year at age 44
- 1556 - Amato Lusitano describes venous valves in the Ázigos vein
- 1559 - Realdo Colombo describes the circulation of blood through the lungs in detail
- 1563 - Garcia de Orta founds tropical medicine with his treatise on Indian diseases and treatments
- 1596 - Li Shizhen publishes Běncǎo Gāngmù or Compendium of Materia Medica, containing 1,892 distinct herbs and other materia medica. There are some 11,096 side prescriptions to treat common illness.
- 1603 - Girolamo Fabrici studies leg veins and notices that they have valves which allow blood to flow only toward the heart
- 1628 - William Harvey explains that the vein-artery system is a continuous loop and that the heart works like a pump to push blood in a one-way circuit through the body, in *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus*
- 1701 - Giacomo Pylarini gives the first smallpox innoculations in Europe. They were widely practised in the east before then.

- 1747 - James Lind discovers that citrus fruits prevent scurvy
- 1763 - Claudius Aymand performs the first successful appendectomy
- 1785 - William Withering publishes *"An Account of the Foxglove"* the first systematic description of digitalis in treating dropsy
- 1790s - Samuel Hahnemann rages against the prevalent practice of bloodletting as a universal cure and founds homeopathy
- 1796 - Edward Jenner develops a smallpox vaccination method

1800 - Present

- 1800 - Humphry Davy announces the anaesthetic properties of nitrous oxide
- 1816 - Rene Laennec invents the stethoscope
- 1818 - British obstetrician James Blundell performs the first successful human blood transfusion.
- 1842 - Crawford Long performs the first surgical operation using anaesthesia with ether
- 1847 - Ignaz Semmelweis discovers how to prevent puerperal, childbed fever, a blood infection passed to women during childbirth by their doctors. The fever killed one-third of mothers in hospitals of the time.
- 1849 - Elizabeth Blackwell is the first woman to gain a medical degree
- 1855 - first rubber condom[20]
- 1867 - Lister publishes *Antiseptic Principle of the Practice of Surgery*, based partly on Pasteur's work.
- 1870 - Louis Pasteur and Robert Koch establish the germ theory of disease
- 1879 - first vaccine for cholera
- 1881 - Louis Pasteur develops an anthrax vaccine
- 1882 - Louis Pasteur develops a rabies vaccine
- 1890 - Emil von Behring discovers antitoxins and uses them to develop tetanus and diphtheria vaccines
- 1895 - Wilhelm Conrad Röntgen discovers medical use of X-rays in medical imaging
- 1901 - Karl Landsteiner discovers the existence of different human blood types
- 1901 - Alois Alzheimer identifies the first case of what becomes known as Alzheimer's disease
- 1906 - Frederick Hopkins suggests the existence of vitamins that a lack of vitamins causes scurvy and rickets
- 1907 - Paul Ehrlich develops a chemotherapeutic cure for sleeping sickness
- 1908 - Victor Horsley and R. Clarke invents the stereotactic method
- 1909 - First Intrauterine device described by Richard Richter.[21]
- 1917 - Julius Wagner-Jauregg discovers the malarial fever shock therapy for general paresis of the insane
- 1921 - Edward Mellanby discovers vitamin D and shows that its absence causes rickets
- 1921 - Frederick Banting and Charles Best discover insulin - important for the treatment of diabetes
- 1923 - First vaccine for Diphtheria
- 1926 - First vaccine for Pertussis
- 1927 - First vaccine for Tuberculosis
- 1927 - First vaccine for Tetanus
- 1928 - Alexander Fleming discovers penicillin
- 1929 - Hans Berger discovers human electroencephalography
- 1932 - Gerhard Domagk develops a chemotherapeutic cure for streptococcus
- 1933 - Manfred Sakel discovers insulin shock therapy
- 1935 - Ladislas J. Meduna discovers metrazol shock therapy
- 1935 - First vaccine for Yellow Fever
- 1936 - Egas Moniz discovers prefrontal lobotomy for treating mental diseases
- 1938 - Ugo Cerletti and Lucio Bini discover electroconvulsive therapy
- 1949 - First implant of intraocular lens, by Sir Harold Ridley
- 1952 - Jonas Salk develops the first polio vaccine
- 1957 - William Grey Walter invents the brain EEG topography (toposcope)
- 1960 - Invention of Cardiopulmonary resuscitation (CPR)
- 1960 - First combined oral contraceptive approved by the FDA[21]
- 1962 - First Oral Polio Vaccine
- 1964 - First vaccine for Measles
- 1965 - Frank Pantridge installs the first portable defibrillator

- 1967 - First vaccine for Mumps
- 1967 - Christiaan Barnard performs first human heart transplant
- 1970 - First vaccine for Rubella
- 1981 - First vaccine for Hepatitis B
- 1987 - Ben Carson, leading a 70-member medical team in Germany, was the first to separate occipital craniopagus twins.
- 1999 - Great Ormand Street Hospital discovers XLP (X-linked lymphoproliferative syndrome) and finds how to find it in children / adults.
- 2003 - Carlo Urbani, of Doctors without Borders alerted the WHO to the threat of the SARS virus, triggering the most effective response to an epidemic in history. Urbani succumbs to the disease himself in less than a month.
- 2005 - David Hartley in the UK sets up the XLP Research Trust to find a genetic cure for XLP.

GENERAL PRACTITIONER

A **general practitioner** or **GP** is a medical practitioner who provides primary care and specializes in family medicine. A general practitioner treats acute and chronic illnesses and provides preventive care and health education for all ages and both sexes. They have particular skills in treating people with multiple health issues and comorbidities. The term *general practitioner* or *GP* is common in Ireland, the United Kingdom, and several other Commonwealth countries. In these countries the word physician is largely reserved for certain other types of medical specialists, notably in internal medicine.

Brazil

General practice in Brazil is called *clínica geral* or *clínica médica*. Any physician is legally allowed to practice without any training after graduation in the medical school, but recent efforts by the government, the Brazilian Medical Association and the specialized Sociedade Brasileira de Clínica Médica are trying to demand also a specialist title for its practice, just like for others such as cardiology, endocrinology, etc. The majority of general practitioners in Brazil are located in the public health sector and consists mostly of young, recently graduated physicians.

The reason is that general practice is not very profitable and about 40% of Brazilian medical practitioners prefer to do specialized practice, instead. To do this, they are required to do medical residence of variable duration and submit to a board of medical examiners in order to get the title of specialist. Each medical society is in charge of organizing the examinations (which usually are carried out once a year) and granting the titles to those physicians who passed the requirements. The title is recognized by the Federal Council of Medicine (the Federal professional regulatory body), the Ministry of Education and the Ministry of Health.

Family medicine, on the other hand, has evolved only recently in Brazil as a separate specialization of general practice. It is a concept which was adapted from several community health models in Europe, such as in Italy, but particularly the one which was created successfully in Cuba, and which was felt to be the most adequate to Brazilian reality. Around 10 years ago, the government recognized that primary health care in Brazil was poorly organized and fraught with many problems, including a lack of attractiveness to young physicians, so a different approach, the Family Health Program was tried, initially with some failures, but later with increasing strength and coverage.

By spending a great deal of money in order to move the program forward, the Ministry of Health expanded and reinforced the public health care system, called Unified Health System by decentralizing its management to the states and municipalities, by demanding in the Federal Constitution that a minimum %age of the municipal budget should be spent in free health care to the population, and by setting up a new, multidisciplinary, family health-based system, the PSF.

It is essentially based on teams composed by one to four physicians (usually a GP, a gynecologist/obstetrician and a pediatrician), one to two dentists, several nurses and a number of so called Community Health Agents, who are trained lay persons who visit and have close contact with the families covered in a specific geographical location by the PSF team, in order to carry out preventative, educational and epidemiological work. Specific intensive training programs and recruiting efforts were set up in the country in order to form the PSF teams, which currently involve about 3,000 municipalities, with more than 45,000 teams already in operation; so that it can be considered one of the largest family health programs in the world.

Family medical practitioners per se are still a rare specialty in Brazil, as the profession is generally shunning it (although economical incentive is no longer a valid reason, since medical practitioners who work in the PSF units are generally well paid in comparison to primary health care physicians in the public sector. A few years ago a Brazilian Society of Family and Community Medicine was founded and has lobbied to have its own specialty title and board of examiners, but it has so far remained relatively small.

Canada

In Canada, just like in the United States, there have become two meanings for the term general practitioner. The Canadian specialty that is equivalent to the English general practitioner training program is family medicine which accounts for almost 40% of the residency positions for graduating students. Following four years in medical school, a resident will spend 2–3 years in an accredited family medicine program. At the end of this, residents are eligible to be examined for Certification in the College of Family Physicians of Canada. Many hospitals and health regions now require this certification.

To maintain their certificate, medical practitioners must document ongoing learning and upgrade activities to accumulate "MainPro" credits. Some practitioners add an extra year of training in emergency medicine and can thus be additionally certified as CCFP(EM). Extra training in anesthesia, surgery and obstetrics may also be recognized but this is not standardized across the country.

General practitioners in Canada do operate in private practice, in that they are not employees of the government. They either own their own practice or work for a privately owned practice.

However, the majority of GPs are remunerated via their provincial governments' publicly funded health insurance plans, via a variety of payment mechanisms, including fee-for-service, salaried positions, and alternate payment plans. There is increasing interest in the latter as a means to promote best practices within a managed economic environment. As standard office practice has become less financially viable in recent years, many FPs now pursue areas of special interest. In rural areas, the majority of FPs still provide a broad, well-rounded scope of practice. Manpower inequities in rural areas are now being addressed with some innovative training and inducement mechanisms. An imbalance between physician manpower and a growing patient load has resulted in orphan patients who find it difficult to access primary care, but this is not unique to Canada. Family Medicine is recently recognized as a Medical Specialty in Canada. Family Physicians who pass the Certification exam, CCFP, become Specialist in Family Medicine.

United States

All medical practitioners must hold a license to practice medicine in the United States. The only requirement is that the physician be enrolled in or have completed a year of training, more commonly called a rotating internship. There is generally 4 years of undergraduate college and 4 years of medical school prior to the internship. All licensed medical practitioners who complete a three-to ten-year residency are legally allowed to practice medicine in the state within which they are licensed.

The population of this type of medical practitioner is declining, however. Currently the United States Navy has many of these general practitioners, formally known as General Medical Officers, in active practice.

The US now holds a different definition for the term "general practitioner." The two terms "general practitioner" and "family practice" were synonymous prior to 1970. At that time both terms (if used within the US) referred to someone who completed medical school and the one-year required internship, and then worked as a "general family doctor." Completion of a post-graduate specialty training program or residency in family medicine was, at that time, not a requirement. A medical practitioner who specializes in "family medicine" must now complete a residency in family medicine, and must be eligible for board certification, which is required by many hospitals and health plans. It was not until the 1970s that family medicine (formerly known as family practice) was recognized as a specialty in the US.

Many licensed family medical practitioners in the United States after this change began to use the term "general practitioner" to refer to those practitioners who previously did not complete a family medicine residency.

Family medical practitioners (after completing medical school) must then complete three to four years of additional residency in family medicine. Three hundred hours of medical education within the prior six years is also required to be eligible to sit for the board certification exam; these hours are largely acquired during residency training. The existing general practitioners in the 1970s were given the choice to be grandfathered into the newly created specialty of Family Practice.

As well, an Academy of Family Practice was created and The Academy of General Practice was allowed to die. The prior system of graduating from medical school and completing one year of post-graduate training (rotating internship) was abolished. If one wanted to become a "house-call-making" type of physician, one needed to stay in the academic setting two or three more years.

Since many general practitioners were grandfathered into this specialty, the number of family practitioners initially grew significantly. However, the number of medical students graduating into Family Practice drastically declined. Logically, students felt that they could complete similar residencies in higher-paying specialities in the same amount of time. This produced more of the lower-cost and less-trained "medical extenders" such as physician assistants, nurse practitioners, etc.

Between 2003 and 2009 the board certification process changed in family medicine and all other American Specialty Boards to a continuous series of yearly competency tests on differing areas within the given specialty. The American Board of Family Medicine, as well as other specialty boards, now requires additional participation in continuous learning and self-assessment activities that enhance clinical knowledge, expertise and skills.

The Board has created a program called the "Maintenance of Certification Program for Family Physicians" (MC-FP) which requires family practitioners to continuously demonstrate proficiency in four areas of clinical practice: professionalism, self assessment/lifelong learning, cognitive expertise, and performance in practice. The American Academy of General Physicians, the only such organization representing general practitioners, it is also the only organization that provides a path for Board Certification in this specialty.

Through the American Board of General Practice, there is a specialty of "General Practice with Board Certification." These organizations also actively train physicians and educate physicians with a prescribed body of knowledge through the American College of General Medicine. The American Academy of General Physicians is actively involved in providing a pathway to "Board Certification" for a large number of General Practitioners produced by the medical colleges. These physicians have no other path to board certificate save going back into a residency program, which is not feasible in most cases due to a variety of reasons. The new system of academically trained "Specialist" Family Practitioners has indeed produced well-trained physicians. However, many feel that these physicians are less likely to go to smaller towns, and rural communities. Due to socio-economic conditions or circumstances as well as access to recent technology.

General Practitioners have in the past, and currently are being created by the present system of producing doctors, with no way to codify or "Board Certify" their competency for numerous reasons.

The American Board of General Physicians has been in existence for over 10 years. It is charged with certifying the quality of the physicians who have completed a prescribed course of study and practice and has no relation to the American Board of Specialties. Presently doctors Board Certified by the American Board of General Practice are accepted readily in large and small hospitals and medical centers as well as smaller community based hospitals. Prior to recent history most postgraduate education in the United States was accomplished using the mentor system. A physician would finish a rotating internship and move to some town and be taught by the local physicians the skills needed for that particular town. This allowed each community need's to be met by the teaching of the new general practitioner the skills needed in that community. This also allowed the new physician to start making a living and raising a family, etc.

General practitioners would be the surgeons, the obstetricians, and the internists for their given communities. Changes in demographics, the growing complexities of the developing bodies of knowledge made it necessary to produce more highly trained surgeons and other specialists. For many physicians it was a natural desire to want to be considered "specialists". What was not anticipated by many physicians is that an option to be a generalist would be abolished.

The general practice concept has always been based on creating a physician who can "do anything" that may be necessary for the patient’s life and welfare, as well as for the community. As well, the general practice movement promotes the continuing education of its doctors using the Internet-based information systems, community-based educational resources as well as academic center based resources.

There is currently a shortage of primary care physicians (and also other primary care providers) due to several factors, notably the lesser prestige associated with the young specialty, the lesser pay, and the increasingly frustrating practice environment. In the US physicians are increasingly forced to do more administrative work, and shoulder higher malpractice premiums.

Australia & New Zealand

General Practice in Australia and New Zealand has undergone many changes in training requirements over the past decade. The basic medical degree in Australia is the MBBS, and New Zealand the MBChB degree (Bachelor of Medicine, Bachelor of Surgery), which has traditionally been attained after completion of a six-year course. Over the last few years, an ever increasing number of four-year medical programs that require a previous bachelors degree have become more common and now account for up to half of all Australian medical graduates. After graduating, a one- or two-year internship (dependent on state) is required for registration before specialist training begins. For general practice training, the physician then applies to enter the three-year "Australasian General Practice Training Program", a combination of coursework and apprenticeship type training leading to the awarding of the FRACGP (Fellowship of the Royal Australian College of General Practitioners) or FRNZCGP (Fellowship of the Royal New Zealand College of General Practitioners), if successful.

Since 1996 this qualification or its equivalent has been required in order for the GP to access Medicare rebates as a general practitioner. Medicare is Australia's universal health insurance system, and without access to it, a practitioner cannot effectively work in private practice in Australia.

The Royal Australian College of General Practitioners also has a reciprocal agreement with the American Board of Family Medicine as the Australasian general practitioner training program is recognized as equivalent to the US family medicine residency programs in the United States. There is a shortage of GPs in rural areas and increasingly outer metropolitan areas of large cities, which has led to the utilization of overseas trained doctors (OTDs).

India

The basic medical degree in India is the MBBS/BAMS/BHMS, which is a four and a half year long course, followed by a one year compulsory rotatory internship. The internship requires the candidate to work in all the departments for a stipulated period of time to undergo hands on training in managing patients.

Any MBBS medical practitioner can appear for pre-post-graduate examinations (Pre-PG) at national, state or institute levels and gain entry to a MD (Doctor of Medicine), MS (Master of Surgery) or a Diploma course in a number of specializations including Internal Medicine (or General Medicine).

One can also opt to join the National Board of Examinations (NBE)'s fellowship for Family Medicine and other specializations at any of the NBE designated and recognized Health care center or hospital and appear for qualifying exams for fellowship to the National Board on successful completion of which, one is awarded the "Diplomate of National Board" degree and title.

Other than MBBS in mainstream medicine, there are several other courses available in alternative systems of medicine(other than allopathy). BAMS (Bachelors in Ayurveda Medicine & Surgery)is the main qualification in integrated system of medicine i.e. modern scientific medicine & ayurveda, BHMS (Bachelors in Homeopathic Medical Sciences) is the main qualifications in alternative systems of medicine, other than several Diploma courses which are available through Government and Private institutions both.

France

In France, the commonly called *docteur* is responsible for the long term care in a population. This implies prevention, education, care of the diseases and traumas that do not require a specialist, and orientation towards a specialist when necessary. They also follow the severe diseases day-to-day (between the acute crises that require the intervention of a specialist). They have a role in the survey of epidemics, a legal role and a role in the emergency care. They often go to a patient's home when the patient cannot come to the consulting room (especially in case of children or old people), and have to contribute to a night and week-end duty.

The studies consist of six years in the university (common to all medical specialties), and three years as a junior practitioner (*interne*).

- the first year (PCEM1, *premier cycle d'études médicales, première année*, often abbreviated to *P1* by students) is common with the dentists and midwifery; the rank at the final competitive examination determines in which branch the student can go on;
- the following two years, called *propédeutique*, are dedicated to the fundamental sciences: anatomy, human physiology, biochemistry, bacteriology, statistics...

- the three following years are called *externat* and are dedicated to the study of clinical medicine; they end with a classifying examination, the rank determines in which specialty (general medicine is one of them) the student can make his *internat*;
- the *internat* is three years of initial professional experience under the responsibility of a *senior*, the *interne* can prescribe, he can replace physicians, and usually works in a hospital.

This ends with a doctorate, a research work which usually consist of a statistical study of cases to propose a care strategy of a specific affection (in an epidemiological, diagnostic, or therapeutic point of view).

The Netherlands & Belgium

General practice in The Netherlands and Belgium is considered fairly advanced. The *huisarts* (literally: "home doctor") administers all first-line care, and makes required referrals. Many have a specialist interest, e.g. in palliative care.

In The Netherlands, training consists of three years of specialization after completion of internships. In Belgium, one year of lectures and two years of residency are required.

Spain

In Spain the commonly called works in multidisciplinary teams (pediatrics, nurses, social workers and others) on primary care centers. They are in most cases salary-based healthcare workers. Some of the specialist in family practice in Spain are forced to work in other countries (mainly UK, Portugal and France) due to lack of stable work.

United Kingdom

In the United Kingdom, doctors wishing to become GPs take at least 4 years training after medical school, which is usually an undergraduate course of five to six years (or a graduate course of four to six years) leading to the degrees of Bachelor of Medicine and Bachelor of Surgery (MB ChB/BS). Up until the year 2005, those wanting to become a General Practitioner of medicine had to do a minimum of the following postgraduate training:

- one year as a pre-registration house officer (PRHO) (formerly called a house officer), in which the trainee would usually spend 6 months on a general surgical ward and 6 months on a general medical ward in a hospital;
- two years as a senior house officer (SHO) - often on a General Practice Vocational Training Scheme (GP-VTS) in which the trainee would normally complete four 6-month jobs in hospital specialties such as obstetrics and gynaecology, paediatrics, geriatric medicine, accident and emergency or psychiatry;
- one year as a general practice registrar.

There are many arrangements under which general practitioners can work in the UK. While the main career aim is becoming a principal or partner in a GP surgery, many become salaried or non-principal GPs, work in hospitals in GP-led acute care units, or perform locum work.

Whichever of these roles they fill the vast majority of GPs receive most of their income from the National Health Service (NHS). Principals and partners in GP surgeries are self-employed, but they have contractual arrangements with the NHS which give them considerable predictability of income. The (MB ChB/BS) medical degree is entirely equivalent to the North American MD medical degree. Medical practitioners educated in the United States, Canada, Australia, New Zealand, Ireland, and Great Britain have more ability to move between the countries than other national systems.

HEALTH & DISEASES

Note: This material is a collection of English words and phrases for the topics Health, Human body, Diseases, Medical care. The material does not offer any suggestions or recommendations on how to stay healthy or treat diseases.

Примечание: Данный материал представляет собой подборку английских слов и фраз по темам Health, Human body, Diseases, Medical care. Данный материал не предлагает советов и рекомендаций о том, как оставаться здоровым или лечить болезни.

Healthy living

healthy living, healthy lifestyle, to be in good health, to feel well;

balanced diet, nutritious food, to have regular meals, to eat plenty of fruit and vegetables;
proteins, fats, carbohydrates, vitamins, minerals;
to be overweight, to go on a diet, to stay slim;
physical fitness, regular exercise, sports;
to do morning exercises, to exercise regularly, to play sports, to go swimming;
to feel well, to be in good health, to be physically fit, to be in good shape;
healthy environment, clean water, fresh air, to quit smoking / to give up smoking;
to sleep well, to have / to get a good night's sleep, to have eight hours of sleep;
coping with stress, to cope with stress;
regular medical checkups, preventing injuries and diseases.

Human body

body and soul, flesh and blood, skin and bones

Head

head, skull, brain, face, ears, hair;
face, forehead, temples, eyebrows, eyes, cheeks, nose, mouth, lips, chin;
eye, eyelid, eyelashes, eye socket / orbit, eyeball, pupil, iris, retina, lens, optic nerve;
nose, bridge of the nose, nostrils, sinuses;
mouth, jaws, teeth, gums, tongue, tip of the tongue, hard palate, soft palate, uvula;
tooth, teeth, front teeth, back teeth, upper teeth, lower teeth, molar, premolar, incisor, canine tooth, wisdom tooth, milk tooth;
ear, earlobe, middle ear, eardrum.

Body

body, neck, chest, stomach, back, buttocks, arms, hands, legs, feet;
skeleton, bone, bone marrow, spine, collarbone, breastbone, rib, pelvis;
spine / backbone / spinal column / vertebral column, vertebra, vertebrae, coccyx;
joint, tendon, ligament, muscle;
neck, Adam's apple, nape of the neck, throat, pharynx, larynx, vocal cords;
torso, trunk, chest, breast, nipple, diaphragm, abdomen, navel.

Limbs

upper limbs, arm, shoulder, armpit, elbow, forearm, wrist, hand;
hand, palm, fingers, thumb, index finger, middle finger, ring finger, little finger, fingernail;
lower limbs, leg, hip, thigh, knee, kneecap, calf, shin, ankle, foot;
foot, feet, sole, heel, toes, big toe, little toe, toenail.

Internal organs

circulatory system, respiratory system, digestive system, nervous system, urinary tract;
heart, lung, trachea, bronchi, esophagus, stomach, gall bladder / gallbladder, liver, small intestine, large intestine, kidney, bladder, spleen;
aorta, artery, vein, capillary, blood, lymph, blood vessel, blood circulation;
endocrine glands, thyroid gland, pituitary gland, adrenal glands, pancreas, lymph glands;
reproductive organs, conception, pregnancy, embryo, fetus, childbirth;
to be pregnant, to have a baby, to give birth to a male child / female child;
body fluids / bodily fluids, blood (red blood cells, white blood cells, plasma), lymph, gastric juice, bile, mucus, tears, saliva, sweat, urine.

Blood groups / blood types

blood group A, blood group B, blood group AB, blood group O / blood type O, blood type A, blood type B, blood type AB;
Rh factor, Rh-positive, Rh-negative;
Examples: Peter has type A blood with a positive Rh factor. His blood type is A positive. Mike is Type O negative. He is Rh negative. Anna is type B positive. She is type B+. I am AB negative.

Diseases and disorders

disease, malady, ailment, illness, sickness, disorder, health problem;
chronic disease, acute disease, serious disease, heart disease, common diseases;
infectious disease, contagious disease, communicable diseases, noncommunicable diseases;
to have a heart disease, to suffer from asthma, to catch an infectious disease;
minor disorder, major disorder, nutrition disorder, blood disorders, mental disorders, congenital disorders, hereditary disorders, hormonal disorders;
to have a minor kidney disorder, to have a serious genetic disorder;
to fall ill, to be ill, to be sick, to be in poor health, to be in bad shape;
to have a cold, to catch cold, to come down with a cold, to come down with pneumonia, to go down with a cold / with pneumonia;
to have a headache, to have a toothache, to have earache, to have a pain in the stomach, to have chest pains, my left foot hurts, my wrist hurts;
to have an allergy to medication / to medicines / to drugs; to be allergic to pollen / to animal hair / to smoke; to have food allergies;
to faint, to lose consciousness, to be unconscious, to regain consciousness;
to treat, to cure, to heal; to be on the mend, to recover (from an illness), to get well.

Specific diseases, disorders, injuries

Skin: skin irritation, skin inflammation, redness, tenderness, swelling, rash, dermatitis, itchy skin / itching, acne, pimple, boil, blister, burn, scar, scratch, corn, callus, wart, eczema, psoriasis.
Hair: dandruff, split ends, thinning hair, hair loss, baldness.
Eye: nearsightedness, farsightedness, astigmatism, crossed eyes, conjunctivitis, sty, retinal detachment, cataract, glaucoma, blindness, color-blindness.
Ear: wax blockage, hearing loss, earache, ruptured eardrum, otitis / infection of the middle ear.
Nose, throat, lungs: nosebleed, runny nose, stuffy nose, rhinitis, allergic rhinitis / hay fever, sinusitis, a cold, tonsillitis, pharyngitis, laryngitis, bronchitis, pneumonia, asthma.
Heart and circulation: atherosclerosis, hypertension / high blood pressure, heart disease, coronary heart disease, coronary thrombosis, heart failure, heart attack, cardiac arrest, congenital heart disease, varicose veins, thrombophlebitis.
Blood: anemia, bleeding, internal bleeding, hemorrhage, hemophilia, leukemia.
Brain and nervous system: headache, migraine, dizziness / giddiness / vertigo, fainting spell, neuralgia, meningitis, epilepsy, convulsions, seizure, stroke, paralysis, cerebral palsy, dementia.
Nutrition: vitamin deficiency, mineral deficiency, obesity, to be overweight, weight loss, anorexia, bulimia.
Stomach, intestines: heartburn, indigestion, dyspepsia, upset stomach, diarrhea, nausea, vomiting, gastritis, ulcer, gastroenteritis, colitis, constipation, appendicitis, hemorrhoids, dysentery, cholera.
Liver: hepatitis, jaundice, cirrhosis. Gall bladder: gallstones, cholecystitis.
Kidneys, bladder: pyelonephritis, kidney stones, cystitis.
Bones, joints: backache / back pain, scoliosis, osteoporosis, arthritis.
Muscles: muscle spasm, muscle cramp, muscular dystrophy, hernia.
Injuries: injury, wound, trauma, hand injury, knee injury, foot injury, head injury, concussion, contusion, fracture, fractured bone, slipped disc / prolapsed disc, dislocation, sprain, sprained ankle, pulled muscle, bruise, to break one's arm, to have a broken arm.
General infections / systemic infections: the flu / influenza, tuberculosis, tetanus, rabies, yellow fever, typhoid, smallpox, anthrax, leprosy.
Infectious diseases (especially in childhood): measles, rubella / German measles, mumps, whooping cough / pertussis, diphtheria, polio, chicken pox, scarlet fever.
Infestations, parasytes: helminthic invasion, tapeworm, pinworm, hookworm, roundworm, scabies, malaria, lice, fleas, ticks.
Hormonal disorders: diabetes, disorders of the pituitary gland, disorders of the thyroid gland.
Oncology: benign tumor, malignant tumor, cancer, lung cancer, breast cancer, stomach cancer, skin cancer.
Mental disorders: depression, phobia, schizophrenia.
Addictions: alcohol abuse, drug abuse.

Medical care

Doctors, medical specialists

physician, general practitioner, family doctor;
surgeon, neurosurgeon, plastic surgeon, orthopedic surgeon, orthopedist;
neurologist, dermatologist, gastroenterologist, urologist, pediatrician, psychiatrist, oncologist, dentist, dietician;
cardiologist / heart specialist, ophthalmologist / eye specialist, otolaryngologist (ear, nose and throat specialist);
women's doctor, gynecologist, obstetrician;
anesthesiologist, radiologist, pharmacist, veterinarian;
nurse, paramedic.

Medical examinations, tests, operations

physical examination, to be examined by a doctor, to have a checkup, to have a medical;
blood test, urine test, X-ray, electrocardiogram;
to take a temperature, to take a blood test, to take an X-ray;
to measure weight and height, to measure blood pressure;
to check the pulse, check your pulse rate, to take the patient's pulse, to count the pulse, to count the heartbeats;
vaccination, immunization, medical history;
to dress the wound, to put a broken arm in a cast, to give an injection / to give a shot;
to check into a hospital, to have an operation, to undergo an operation;
to give a blood transfusion, to donate blood, blood donor;
tonsils removal, appendix removal, heart surgery, organ transplantation, kidney transplant;
plastic surgery, cosmetic surgery, skin graft.

Dental care

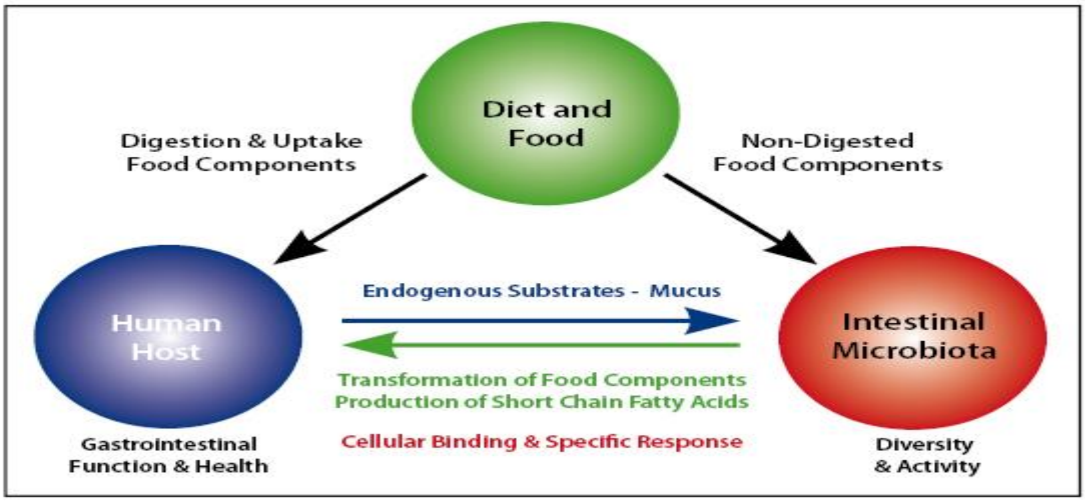
dental care, toothpaste, toothbrush, mouthwash, dental floss;
to wear braces; to have dentures;
to have a toothache, to go to the dentist;
to have a cavity, to drill the tooth, to fill the cavity / to fill the tooth, to have a tooth filled;
to have root canal treatment, to have a tooth capped;
to have a tooth pulled, to have a wisdom tooth extracted.

Medical instruments

thermometer, eye dropper, nose dropper, hot-water bag / hot-water bottle, heating pad, enema;
tongue depressor, stethoscope, syringe, scalpel; bandage, sterile gauze, cotton wool, adhesive plaster, Band-Aid, elastic bandage, tourniquet; ice pack, sling, cast, crutches, stretcher.

Medicines

pill, tablet, capsule, powder, drops, syrup, tincture, lotion, spray, ointment, cream; analgesic / analgetic, antacid, antibiotic, tranquillizer, contraceptive, laxative, decongestant; antiseptic, anti-bacterial spray, rubbing alcohol, iodine, to paint with iodine; medicine chest, medicine cabinet, first-aid kit.



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