

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ЧЕРНІГІВСЬКИЙ НАЦІОНАЛЬНИЙ ТЕХНОЛОГІЧНИЙ
УНІВЕРСИТЕТ**

**Англійська мова у сфері фізичного
виховання, спорту і здоров'я людини**
(частина 2)

Методичні вказівки до практичних занять для студентів
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ВСТУП

Методичні вказівки призначені для проведення практичних занять зі студентами 2 курсу денної форми навчання спеціалізації „Здоров’я людини” та укладені відповідно до чинної навчальної програми з дисципліни “Іноземна мова за професійним спрямуванням”.

Мета пропонованих методичних вказівок – сприяти формуванню професійно-орієнтованої компетенції в усному і писемному мовленні, що здійснюється в межах ситуативного професійного контексту.

Методичні вказівки містять 3 модулі, в які входять 12 тем із текстами для читання, завданнями для перевірки прочитаного, лексичними та граматичними вправами. Підібраний текстовий матеріал є органічним компонентом професійної підготовки студентів. Фахові тексти та система вправ допоможуть майбутнім спеціалістам оволодіти відповідною термінологічною лексикою, підготують їх до спілкування іноземною мовою у професійному середовищі. Різноманітність та варіативність завдань сприятимуть реалізації диференційованого та індивідуального підходів до студентів.

У кінці методичних вказівок подано граматичний коментар ілюстрований прикладами з лексичним наповненням зі спеціальності.

Unit 1. Human body

1.1 Answer the questions:

1. What are the principal parts of the human body?
2. What are the principal organs in the chest?
3. What supports the soft parts and protects the organs from injury?

1.2 Match the English words with their Ukrainian equivalents. Consult the dictionary and practise their pronunciation

1. Limb	a) піднебіння
2. Palate	b) великий палець
3. Heart	c) чоло
4. Thumb	d) язик
5. To smell	e) шлунок
6. Tongue	f) ушкодження
7. Stomach	g) зап'ясток
8. Injury	h) сідниці
9. Wrist	i) відчувати запах j) кінцівка
10. Buttocks	k) серце
11. Forehead	

1.2. 1 Read the text to find the answers to the following questions:

1. What are the principal parts of the human body?
2. What does the face include?
3. What is the organ of taste?
4. Where do eyelashes grow?
5. What do we breathe through?
6. What are the principal organs in the chest?
7. What does the upper/lower extremity consist of?
8. What supports the soft parts and protects the organs from injury?

Human body

The principal parts of the human body are the head, the trunk, and limbs (extremities).

The head consists of 2 parts: the skull contains the brain and the face including the forehead, the eyes, nose, the mouth, the cheeks, the ears and the chin.

Each eye has the eyelids and the eyelashes that grow along the edge of the eyelids. There are the eyebrows over our eyes. The eyes serve as the organ of sight.

The nose is the organ of smell through which we breathe.

The ear includes 3 principal parts: the external, the middle and the internal ear.

The mouth has 2 lips: the upper and the lower lip. The tongue which is the organ of taste, teeth and hard and soft palates are located in the mouth.

The head is connected with the trunk by the neck.

The upper part of the trunk is the chest. The principal organs in the chest are the lungs, the heart and the esophagus (gullet).

The lower part of the trunk called abdomen consists of the stomach, the liver, the spleen, the intestines, the kidneys, the gallbladder and the bladder.

The surface of the body from the neck to the buttocks is called the back.

The waist is the narrow middle part of the body above the hips.

When we speak of the upper extremity we mean the arm. The upper extremity is connected with the chest by the shoulder consists of the upper arm, the forearm, the elbow, the wrist and the hand. We have 5 fingers on each hand. A short finger set apart from the other is called the thumb.

The lower extremity called the leg consists of the hip (thigh), the knee, the calf, the ankle and the foot. The foot is composed of the toes, the heel, the sole and the arch. The nail is a hard part at the end of a toe and finger.

The framework of bones called the skeleton supports the soft parts and protects the organs from injury. The bones are covered with muscles.

The body is covered with the skin.

1.2.2 Complete the sentences with the phrases from the text

1. The head consists of 2 parts...
2. The ear includes 3 principal parts...
3. The mouth has 2 lips...
4. The lower part of the trunk consists of...
5. The upper part of the trunk is...
6. The upper extremity is connected with the chest by...
7. The foot is composed of...

1.3 Fill in the gaps with the words from the box

trunk, waist, smell, back, muscles, skin, sight

1. The eyes serve as the organ of.....
2. The nose is the organ of through which we breathe.
3. The head is connected with the by the neck.
4. The surface of the body from the neck to the buttocks is called the.....
5. The is the narrow middle part of the body above the hips.
6. The bones are covered with.....
7. The body is covered with the.....

1.4 Read the statements and mark them as true (T) or false (F). Prove your point. In your arguments use: *I quite agree with...; I don't think so...; I can't agree with...; from my point of view; as for me; to tell you the truth.*

1. The head consists of 3 parts: the forehead, the eyes and the nose.
2. Each eye has the eyelids and the eyelashes.
3. The upper part of the trunk is the head.
4. When we speak of the upper extremity we mean the arm.
5. The body is covered with the skin.

1.5 Fill the blanks with prepositions

1. There are eyebrows ... our eyes.
2. The nose is the organ ... smell ... which we breathe.
3. The head is connected ... the trunk ... the neck.
4. The teeth are located ... the mouth.
5. We have 5 fingers ... each hand.
6. The skeleton protects the organs ... injury.
7. The body is covered ... the skin.
8. A short finger set apart ... the other is called the thumb.

1.6 Writing activity

Draw a human body pointing out the parts of a body.

1.7 Speaking activity

Imagine that you are a lecturer of a medical school. Prepare and present your lecture on human body to medical students.

1.8 GRAMMAR IN USE: Present, Past or Future Indefinite Active

1.8.1 Put the verbs in brackets into the correct forms:

1. The woman's heart (to be) slightly enlarged.
2. A dislocation (to occur) when the bones of the knee are out of place.
3. The Achilles tendon (to connect) the calf muscle to the heel bone.
4. He (hurt) his back playing tennis last week.
5. The surgeon (arrive) here on time yesterday.
6. He (feel) better when the operation (be) over.
7. Eyelashes (to protect) the eye from debris.
8. Each toe (to consist) of three phalanx bones.
9. He (to want) to become a doctor.
10. We (to study) the theme "Skeleton" next week.

1.8.2 Correct the mistakes:

1. My parents works at the in- patient department.
2. He don`t study French as he study English.
3. A lot of students wants to join the Foreign Language Society.
4. The scientists distinguishes three groups of muscular tissue.
5. An organ don`t contain various tissues.
6. There is several organ systems in the human organism.
7. Tissues is groups of cells , which does the same work.
8. Small children fall down a lot but doesn`t have many fractures.
9. Do milk contain a lot of calcium?
10. Does deficiency of vitamin D in the diet causes bone problems ?

Unit 2. Systems of the body

2.1 Answer the questions:

1. What are the main systems of the body?
2. What does the skeletal system serve to human beings?

2.2 Match the English phrases with their Ukrainian equivalents. Consult the dictionary and practise their pronunciation

1. Muscular	a) циркулярний кровоносний
2. Circulatory	b) дихальний
3. Digestive	c) сечовий
4. Respiratory	d) об'єднаний, супутний
5. Urinary	e) кров
6. Associate	f) азотний
7. Blood	g) сечовипускальний канал,
8. Nitrogenous	h) уретра
9. Urethra	i) вуглекислий газ
10. carbon dioxide	j) видаляти
11. to remove	k) виділяти
12. to discharge	l) м'язовий
	m) травний

2.3 Read the text below and be ready to answer the questions:

1. What is the function of the skeletal system?
2. What is the function of the muscular systems?
3. What is carried by the blood-stream?
4. What is the function of the respiratory system?
5. What does the endocrine system serve for?
6. Where are the hormones produced?
7. What does the urinary system consist of?

SYSTEMS OF THE BODY

System of the body is a group of organs that work together to perform a certain task. A group of systems composes an organism.

There are nine main systems of the body: the skeletal, the muscular, the nervous, the circulatory, the digestive, the respiratory, the urinary, the endocrine and the reproductive systems.

The skeletal system consists of the bones of the body and ligaments and cartilages, which join them. The chief function of the skeletal system is structural.

The muscular system consists of the skeletal muscles and their associated structures. The main function of this system is to move us about.

The nervous system consists of the brain and spinal cord, nerves, ganglia and receptors. It is a complex information system with all the necessary means for receiving, processing, and communicating information.

The circulatory system consists of the heart and blood vessels and the blood, which is pumped through the blood vessels by the heart. Its function is chiefly that of transportation system: the nutrients, oxygen, and special substances which are required by cells are carried by the bloodstream; and the cellular wastes and sometimes other materials produced by the cells are carried away by the bloodstream.

The digestive system consists of the alimentary canal and a number of associated glands.

The respiratory system consists of the lungs, the air passages leading to them and associated structures. Its main function is to convey oxygen to the lungs, where it can enter the blood stream, and to remove carbon dioxide, which escapes from the blood into the lung spaces.

The urinary system consists of two kidneys, which produce urine by removing nitrogenous and other wastes from the blood: the two ureters, which convey the urine away from the kidneys; the urinary bladder, where the urine is stored until it is discharged; and the urethra through which the urine is discharged.

The endocrine system consists of a number of glands throughout the body which produce regulatory substances called hormones. The endocrine system serves to regulate a large number of activities.

2.3.1 Match the terms with their definitions

1. urine	a) A tough, elastic, fibrous connective tissue found in various parts of the body, such as the joints, outer ear, and larynx. A major constituent of the embryonic and young vertebrate skeleton, it is converted largely to bone with maturation.
2. blood	b) The waste product secreted by the kidneys that in mammals is a yellow to amber-colored, slightly acid fluid discharged from the body through the urethra.
3. cell	c) A group of nerve cells forming a nerve center, especially one located outside the brain or spinal cord.
4. nutrients	d) The fluid consisting of plasma, blood cells, and platelets that is circulated by the heart through the vertebrate vascular system, carrying oxygen and nutrients to and waste materials away from all body tissues
5. ganglia	e) The smallest structural unit of an organism that is capable of independent functioning, consisting of one or more nuclei, cytoplasm, and various organelles, all surrounded by a semipermeable cell membrane.
6. cartilage	f) A source of nourishment, especially a nourishing ingredient in a food.

2.3.2 Complete the sentences:

1. There are nine main systems of the body...
2. The urinary system consists of...
3. The endocrine system consists of...
4. The nervous system consists of...
5. The muscular system consists of...
6. The respiratory system serves to...
7. The endocrine system serves to...
8. The chief function of the skeletal system...

2.3.3 Find the equivalents of the following words and word combinations from the text. Make your own sentences with them:

Основні системи, січковий міхур, видаляти вуглекислий газ, переноситися кровотоком, головна функція, вироблятися клітинами, складна інформаційна

система, обробляти інформацію, регулювати різноманітну діяльність, виводити січу з нирок, складатися з серця то кровоносних судин, доставляти кисень до легень, по всьому тілу, складатися з ряду залоз.

2.4 Complete the sentences with the following words and phrases. There are two extra ones:

two kidneys; the nervous system; the digestive system; the muscular system; by the heart; the respiratory system; the heart and blood vessels.

1. The circulatory system consists of ...
2. The blood is pumped through the blood vessels...
3. The main function of ... is to move us about.
4. ...consists of the alimentary canal and a number of associated glands.
5. ...is a complex information system for receiving information.
6. ...produce urine by removing nitrogenous and other wastes from the blood.
7. ... convey oxygen to the lungs.

2.5 Read the statements and mark them as true (T) or false (F). Prove your point. In your arguments use:

I quite agree with...; I don't think so...; I can't agree with...; from my point of view; as for me; to tell you the truth.

1. The nutrients, oxygen, and special substances are carried by the bloodstream.
2. The muscular system consists of a number of glands throughout the body which produce regulatory substances called hormones.
3. The water is pumped through the blood vessels by the heart.
4. System of the body is a group of organs that work jointly to perform a certain task.
5. The nervous system made up of the brain and spinal cord, nerves, ganglia and receptors.

2.6 Writing activity. Render into English:

Тіло людини утворено клітинами різних типів, які організується в тканини і формують органи. Тіло дорослої людини утворюють близько тридцяти трильйонів клітин. Клітини оточені міжклітинною речовиною, що забезпечує їх механічну підтримку і здійснює транспорт хімічних речовин. Людський організм росте і розвивається протягом усього життя.

Тіло людини складається з голови, шиї, тулуба, верхніх та нижніх кінцівок. В організмі людини виділяють кісткову, м'язову, нервову, серцево-судинну, видільну, репродуктивну, ендокринну, імунну і покривну системи.

2.7 Speaking activity. Prepare and be ready to represent your multy media presentation about systems of a human body.

2.8 GRAMMAR IN USE: Present, Past or Future Continuous Active

2.8.1 Put the verbs in brackets into the correct forms:

1. Victor (to work) in the pathology lad now.
2. While my mother (to call) a doctor, my brother (to cry).
3. He (to test) blood to look for bacteria now.
4. She (to carry) out tests on blood from 9 till 10 tomorrow.
5. He (to match) blood for transfusions now.
6. Vic (to translate) the text about systems of the body at 3 o'clock yesterday.
7. The doctor (to prescribe) some medicine to the patient now.
8. The students (not to take) the exam in Microbiology now.

Unit 3. The skeleton

3.1 Answer the questions:

1. What is the function of the skull?
2. What parts can the skeleton be divided into?
3. What is the skeleton constructed of?

3.2 Match the English phrases with their Ukrainian equivalents. Consult the dictionary and practise their pronunciation

1. spine (spinal column)	a) ребро
2. rib	b) спинний хребет, хребетний стовп
3. bone marrow	c) кістковий мозок
4. marrow cavity	d) кістково-мозкова порожнина
5. cranial	e) хрящ
6. facial	f) лицевий
7. breastbone	g) хрящ черепний
8. vertebra (pl. vertebrae)	h) Хребець хребці
9. cervical	i) таз
10. thoracic	j) грудний
11. lumbar	k) поперековий
12. coccyx	l) куприк
13. pelvis	m) шийний
14. joint	n) сухожилля
15. cartilage	o) грудина
16. ligament	p) зв'язка
17. tendon	q) суглоб

3.3 Read the text and be ready to answer the questions:

1. What is the skeleton constructed of?
2. Why are bones important? What are their main functions?
3. What is the function of the skull?
4. Where is bone marrow located?
5. What parts can the skeleton be divided into?
6. How many bones are there in the skull of an adult?
7. What is the biggest bone in the body?
8. How many bones do newborn babies have? Why do adults have fewer bones?

THE SKELETON

The skeleton is constructed of bones. Bones are important in five ways. First, bones are the main support for the body; they give your body shape, the bones that make up your spine allow you to sit up straight, the bones in your legs support the weight of your body so that you can stand up and so on. Another function of your skeleton is movement. Muscles are attached to bones and when muscles move, bones move. Third, bones protect the organs beneath them. The ribs provide protection for the lungs and heart. The skull protects the brain. Fourth, yellow bone marrow stores calcium and fat. Finally, bones are the location where blood cells are produced by the cells of the red bone marrow. Bone marrow is located inside the marrow cavity of bones.

The skeleton can be divided into three basic parts: skull, axial skeleton, and appendicular skeleton. The bones of the skull consist of cranial and facial parts. There are 26 bones in the skull.

The axial skeleton is comprised of the bones that support the trunk. The bones of the trunk are the spinal column or the spine and the chest (ribs and the breastbone). The spine of the adult consists of 32 or 34 vertebrae. There are seven cervical vertebrae, twelve thoracic vertebrae, five lumbar, five sacral vertebrae and from one to five vertebrae which form the coccyx. The lumbar vertebrae are the largest vertebrae in the spinal column. The chest is composed of 12 thoracic vertebrae, the breastbone and 12 pairs of ribs.

The appendicular skeleton consists of the bones of the arms and legs, along with the bones that attach them to the axial skeleton. The lower extremity consists of the thigh, leg and foot. It is connected with the trunk by the pelvis. The upper extremity is formed by the arm, forearm and hand. The bones of the skeleton are connected together by joints, cartilages, ligaments and tendons.

The biggest bone in the body is the femur in the upper leg, and the smallest is the stapes bone in the middle ear. In an adult, the skeleton comprises around 14% of the total body weight, and half of this weight is water.

The human skeleton takes 20 years before it is fully developed. There are 206 bones in the adult human skeleton, a number which varies between individuals and with age - newborn babies have over 270 bones some of which fuse together.

3.3.4 Match the terms with their definitions

1. Skeleton	a) any of the 24 curved elastic bones that together form the chest wall in man
2. Vertebra	b) the spinal column
3. Trunk	c) one of the bony segments of the spinal column
4. Skull	d) the fatty network of connective tissue that fills the cavities of bones
5. Femur	e) the longest thickest bone of the human skeleton, located between the pelvis and the below
6. Rib	f) the bony skeleton of the head
7. Spine	g) a hard framework consisting of bones that supports and protects the soft parts of a human body and provides attachment for muscles
8. Bone marrow	h) the body excluding the head, neck, and limbs

3.3.5 Find the equivalents of the following words and word combinations and make up your own sentences with them:

Повністю розвинутий, складатися з кісток рук та ніг, прикріплені до кісток, зростатися, забезпечити захист, складати спинний хребет, накопичувати кальцій та жир, новонароджені діти, формувати куприк, потребувати 20 років, середнє вухо, варіюватися в залежності від віку, поділити на ..., черепна та лицьова частини, у дорослої людини, половина маси, зв'язки та сухожилля, розміщений у кістково-мозковій порожнині.

3.3.6 Fill the blanks with the right word from the list below:

nervous system; axial; spinal column; chest; appendicular pelvis; vertebrae; joints.

1. The axial skeleton is formed by the ..., the chest and the skull.
2. The ... in female skeletons is different from that of males in order to facilitate child birth.
3. The upright posture of humans is maintained by the ... skeleton.
4. The ... between bones allow movement.
5. The ... protect the spinal cord.
6. Muscles, bones, and joints are all coordinated by the

7. The ... skeleton (126 bones) is formed by the upper limbs and the lower limbs
8. The ... and the spine protect the human lungs, human heart and major blood vessels.

3.3.7 Find the terms from the text:

1. any of the pieces of hard, whitish tissue making up the skeleton in human
2. a long flat vertical bone, situated in front of the thorax, to which are attached the collarbone and the first seven pairs of ribs
3. A small triangular bone at the base of the spinal column in humans consisting of several fused rudimentary vertebrae.
4. One of a series of long curved bones occurring in 12 pairs in humans and extending from the spine to or toward the sternum.
5. a band of strong connective tissue serving to connect bones or hold organs in place.
6. the smallest bone in the human body
7. A band of tough, fibrous, inelastic tissue that connects a muscle to a bone
8. the junction between two or more bones

3.4 Watch the video podcast <https://www.youtube.com/watch?v=UXtG052Klkg> and be ready to speak about the functions of skeleton.

3.5 GRAMMAR IN USE: Present, Past or Future Perfect Active

3.5.1 Put the verbs in the appropriate form.

1. The surgeon (to operate) the patient by 3 o'clock yesterday.
2. Victor (to work) at the City Hospital before he came to our University.
3. After my mother (to call) in a doctor, my temperature fell down.
4. He (to test) blood to look for bacteria by 3 o'clock tomorrow.
5. Vic (to examine) already the function of the skeleton.
6. Students (to study) basic theoretical subjects this month.
7. The district doctor (not to prescribe) him the proper treatment yet.
8. The doctor (to discharge) the patient from the hospital by 3 p.m. yesterday.

3.5.2 Write general questions to the following:

1. He has already prepared for his credit.
2. I will have prepared my seminars by 5 p.m. tomorrow.
3. The surgeon had operated the patient by 3 o'clock yesterday.
4. After she had called a doctor, a child's temperature fell down.
5. He had examined blood under the microscope by 10 o'clock yesterday.

6. Students have studied all basic theoretical subjects this month.
7. The district doctor will have prescribed him the treatment by tomorrow.
8. The doctor will have discharged the patient by 3 p.m. tomorrow.

Unit 4. Andreas Vesalius

4.1 Answer the questions:

1. What do you know about Andreas Vesalius?
2. What was the greatest discovery of Vesalius?

4.2 Match the English phrases with their Ukrainian equivalents

1. the Holy Roman Empire	a) неправильне розуміння
2. a reference book	b) кафедра хірургії
3. the great scientist	c) анатомічні карти
4. doctorate	d) Священна Римська імперія
5. scientific work	e) базуватися на...
6. to be based on	f) розтин, анатомування
7. misconception	g) довідник
8. the chair of surgery	h) великий вчений
9. anatomical charts	i) наукова робота
10. dissection	j) докторський ступінь

4.3 Read the text to find the answers to the following questions:

1. Who is widely considered to be the founder of the modern science of anatomy?
2. Where did Andreas Vesalius study medicine?
3. When was Vesalius awarded the degree of Doctor of Medicine?
4. When was his most important book on human anatomy On the Structure of the Human Body written?
5. What books does his work "On the Structure of the Human Body" consist of?
6. What did Andreas Vesalius study on corpses?
7. What did the Great Russian scientist Pavlov and many other famous scientists say about the works written by Vesalius?
8. What was the greatest discovery of Vesalius?

Andreas Vesalius

Andreas Vesalius is one of the greatest anatomists. He studied medicine in France. In 1537 he got the degree of Doctor of Medicine. In 1538 his first scientific

works in Anatomy were published. In 1543 his most important book "On the Structure of the Human Body" was written.

His work "On the Structure of the Human Body" consists of seven books. The bones of the skeleton, the joints and cartilages were described in the first book; the muscles – in the second; the vessels – in the third; the nerves – in the fourth; the alimentary tract – in the fifth; the heart and the respiratory system – in the sixth; the brain – in the seventh.

In all his researches Vesalius studied the anatomy of the human body on corpses. He studied the structure of the inner organs of the human body taking into consideration their functions. Vesalius was the first scientist to give a proper description of the human skeleton. He also determined that neither the right nor the left ventricles of the heart were connected. He determined that there were no opening in the septum between the left and the right heart chambers. It was a great discovery. Before Vesalius all the scientists considered that the left and the right heart chambers were connected by the opening in the septum. His discovery opened the way to the discovery of the pulmonary and systemic blood circulations in future. Vesalius did much to establish new and exact anatomical terms.

Both the great Russian scientist Pavlov and many other famous scientists said that the works written by Vesalius composed the first anatomy of the human body in which everything was based on scientific research work.

4.3.1 Read the statements and agree or disagree. Prove your point. In your arguments use:

I quite agree with...; I don't think so...; I can't agree with...; I guess...; on the contrary; quite so; exactly; as for me; to tell you the truth.

1. Vesalius is often referred to as the founder of modern physiology.
2. The bones of the skeleton, the joints and cartilages were described in the second book.
3. Vesalius composed the first anatomy of the human body in which everything was based on scientific research work.
4. Before Vesalius all the scientists considered that the left and the right heart chambers were not connected by the opening in the septum.
5. In 1541, while in Bologna, Vesalius uncovered the fact that all of Galen's research had been based upon human anatomy rather than the animal.
6. Vesalius was the first scientist to give a proper description of the human skeleton.

4.3.2 Match the terms with their definitions

1. Heart	a) the transport of oxygenated blood through the arteries to the capillaries, where it nourishes the tissues, and the return of oxygen-depleted blood through the veins to the heart, where the cycle is renewed;
2. nerves	b) a dividing partition between two tissues or cavities;
3. blood circulation	c) a hard framework consisting of inorganic material that supports and protects the soft parts of an animal's body and provides attachment for muscles;
4. corpse	d) In common use, this term has come to specify a dead body used for a particular purpose, such as dissection.
5. the human skeleton	e) the hollow muscular organ in vertebrates whose contractions propel the blood through the circulatory system. In mammals it consists of a right and left atrium and a right and left ventricle;
6. septum	f) a tube carrying blood away from or towards the heart. Blood vessels are the means by which blood circulates throughout the body.
7. blood vessel	g) any of the cordlike bundles of fibers that conduct sensory or motor impulses

4.4 Fill in the gaps with the words and word-combinations:

Physicians; anatomist; charts; the chair; doctorate; had to be; Belgium; forced to

1. Vesalius was a Flemish-born ... whose dissections of the human body helped to correct misconceptions dating from ancient times.

2. Andreas Vesalius was born on 31 December 1514 in Brussels, ... , then part of the Holy Roman Empire.

3. *Vesalius* came from a family of ... and both his father and grandfather had served the holy Roman emperor.

4. Vesalius studied medicine in Paris but was ... leave before completing his degree when the Holy Roman Empire declared war on France.

4. Andreas Vesalius studied at the University of Louvain, and then moved to Padua to study for his.... .

5. Upon completion in 1537 he was immediately offered of surgery and anatomy.

6. Vesalius believed that surgery ... grounded in anatomy.

7. Unusually, he always performed dissections himself and produced anatomical ... of the blood and nervous systems as a reference aid for his students.

4.5 GRAMMAR IN USE: Tenses of Active Voice (Revision)

4.5.1 Open the brackets:

1. I (to prepare) a presentation about sport injuries by 5 p.m. tomorrow.
2. I (to help) injured man by the time you came yesterday.
3. The surgeon already (to operate) the patient.
4. Students (to study) basic theoretical subjects yet?
5. Scientists (not to introduce) new methods of treatment of cancer yet.
6. The district doctor (to prescribe) him the proper treatment today.
7. The doctor (to discharge) the patient by the end of next week.
8. The nurse on duty (to take) already the patients to different procedures.
9. They (to study) heart diseases last Friday.
10. Histology (to deal) with the study of tissues.
11. The patient's sleep (to affect) by nightmare last week.
12. The nurses (to take) good care of him after the last operation.

4.5.2 Put special questions to the underlined words:

1. People often catch cold in winter.
2. The examination has been just finished.
3. Our bodies have 9 main systems.
4. A person rings up his local polyclinic in case of a disease.
5. Symptoms helped to reveal the disease.
6. These remedies will relieve my chest pain.
7. He insists on immediate operation.
8. The body is covered with the skin.
9. Pediatrician helps to deliver a baby.
10. The patient complained of the chest pain.

Module 2. Work of the Human Heart

Unit 1. Anatomy of the Heart

1.1 Answer the questions:

1. Where is the heart located?
2. What does each half of the heart consist of?

1.2 Match the English phrases with their Ukrainian equivalents. Practise their pronunciation

1.	continuously	[kən'tinjʊəsli]	a) передсердя
2.	rhythmically	['rɪðmɪkəlɪ]	b) ритмічно
3.	nutrient	['nju:triənt]	c) поживна речовина
4.	surface	['sɜ:fɪs]	d) перикард
5.	endocardium	['endəu'ka:diəm]	e) ендокард
6.	membranous	['membərənəs]	f) мембранний
7.	pericardium	[peri'kaidiəm]	g) поверхня
8.	septum	['septəm]	h) перетинка
9.	ventricle	['ventrɪk(ə)l]	i) шлуночок
10.	atrium	['ætriəm]	j) безперервно
11.	deoxygenated	[dioksidzi'neɪtɪd]	k) позбавлений кисню
12.	to contract	[kən'trækt]	l) скорочуватись
13.	sinoatrial	[sinoa'triəl]	m) синусно-передсердний
14.	costal cartilages	[kos'təl]	n) реберний хрящ

1.3 Read and translate the sentences paying attention to the adjectives:

1. The resistance to blood flow through the general circulation is much greater than resistance through the lungs.

2. The left side of the heart must contract more forcibly than the right so it has greater muscular bulk.

3. If she changes her job to a less stressful one, she won't complain of her heart so often.

4. The right atrium of the heart is larger than the left one.

5. The walls of the left atrium are thicker than those of the right one.

6. The left ventricle is longer than the right ventricle.

7. The left ventricle is more conical in form than the right one.

8. The smallest veins in the body are called venules.

9. The venules branch into larger veins which eventually carry the blood to the largest veins in the body, the vena cava.

10. The liver is the largest gland and the largest internal organ in the human body.

1.4 Read the text to answer the following questions:

1. What is heart?

2. Where does the heart rest?

3. What supplies the heart with oxygen and nutrients?

4. What is the heart enclosed in?

5. What does septum serve for?
6. What does each half of the heart consist of?
7. What are the valves of the heart?
8. What is the function of the right atrium?
9. What is the function of the left atrium?
10. What do one-way valves at the exits from each chamber ensure?

Anatomy of the Heart

The heart is the muscular pump in the centre of the chest that beats continuously and rhythmically to send blood to the lungs and the rest of the body. It is located on the diaphragm between the lower borders of the lungs, occupying the middle of the mediastinum. It is covered ventrally by the sternum and the adjoining parts from the third to the sixth costal cartilages. The organ is about 12 cm long, 8 cm wide at its broadest part, and 6 cm thick. The weight of the heart in men averages between 280 and 340 g and in women, between 230 and 280 g. Much of the heart consists of myocardium, a special type of muscle. The heart muscle is supplied with oxygen and nutrients by 2 coronary arteries.

The internal surface of the heart is lined with a smooth membrane, called endocardium, and the entire heart is enclosed in a tough, membranous bag, the pericardium. A thick central muscular wall, the septum, divides the heart cavity into right and left halves. Each half consists of an upper chamber, called an atrium, and a larger lower chamber, called a ventricle. The right atrium receives deoxygenated blood from the entire body via 2 large veins called the venae cavae. This blood is transferred to the right ventricle and pumped to the lungs via the pulmonary artery to be oxygenated and to lose carbon dioxide. The left atrium of the heart receives oxygenated blood from the lungs (via the pulmonary veins); this blood is transferred to the left ventricle and then pumped to all tissues in the body.

The valves of the heart include the tricuspid valve, the bicuspid (mitral) valve, the semilunar aortic valve, and the semilunar pulmonary valve. The sinoatrial node in the right atrium of the heart initiates the cardiac impulse, causing the atria to contract. These one-way valves at the exits from each chamber ensure that blood flows in only 1 direction. As resistance to blood flow through the general circulation is much greater than resistance through the lungs, the left side of the heart must contract more forcibly than the right one that's why it has greater muscular bulk.

1.4.1 Match the two columns

1.	to pump	a.	to deprive of oxygen
2.	to contract	b.	to separate into parts
3.	to oxygenate	c.	to acquire or get something
4.	to deoxygenate	d.	to surround on all sides; close in
5.	to receive	e.	to enrich with oxygen
6.	to transfer	f.	to raise or cause to flow by means of a pump
7.	to enclose	g.	to make available for use; provide
8.	to divide into	h.	to reduce in size by drawing together; shrink
9.	to supply	i.	to convey or remove something from one place to another

1.4.2 Find in the text above the English equivalents to the word-combinations. Make up your sentences with them:

М'язовий насос, складатися з 2-х передсердь та двох шлуночків, через дві великі вени, скорочуватись з більшою силою, через легеневі вени, вивільняти вуглекислий газ, скорочуватись безперервно та ритмічно, велике коло кровообігу, внутрішня та зовнішня оболонки серця, більша м'язова маса, верхня та нижня камери, скорочуватися з більшою силою.

1.5 Translate the words in brackets and be ready to retell the text

The human heart provides a (тривалий) blood circulation through the cardiac cycle and is one of the most vital organs in the human body. It is (розділений) four (камер): the two (верхні камери) are called the left and right (передсердя) and two (нижні камери) are called the right and left (шлуночки). Normally the right ventricle (качає) the same blood amount into the lungs with each bit that the left ventricle pumps out. Physicians commonly refer to the right atrium and right ventricle together as the right heart and to the left atrium and ventricle as the left heart.

The electric energy that stimulates the heart occurs in the (синусно-передсердний) node, which produces a definite potential and then (відправляє), sending an impulse across the atria. The Purkinje fibers transmit the electric charge to the myocardium while the (клітини) of the atrial walls (передають) it from cell to cell, making the atrial syncytium.

1.7 Fill the blanks with the words below. You may use each word only once

to cope with, artery, myocardium, direction, the lungs, coronary arteries, oxygenated blood, deoxygenated blood, the right, ventricle.

1. The heart beats continuously and rhythmically to send blood *to* ...and the rest of the body.
2. Much of the heart consists of...
3. The heart muscle is supplied with oxygen and nutrients by two....
4. The right atrium receives ...from the entire body.
5. The left atrium of the heart receives ...from the lungs via the pulmonary veins.
6. One-way valves at the exits from each chamber ensure that blood flows in only one....
7. As resistance to blood flow through the general circulation is much greater than resistance through the lungs, the left side of the heart must contract more forcibly than....
8. Tricuspid valve lies between the right atrium and the right ...
9. Descending aorta is the body's main ...which supplies oxygenated blood to all other parts.
10. The aorta has a large diameter in order ...the high pressure and large volume of blood passing through it.

1.8 GRAMMAR IN USE: Present, Past, Future Indefinite Passive

1.8.1 Open the brackets:

1. The symptoms of illness (to discuss) every day.
2. The doctor (to call) tomorrow.
3. The medicine (to prescribe) by doctors.
4. The patient (to operate) tomorrow.
5. He (to Xray) 5 minutes ago.
6. Football (to play) all round the world.
7. He (to examine) yesterday.
8. The patients (to examine) every day.
9. The medicine (to prescribe) yesterday.
10. These pills (to sell) yesterday.

1.8.2 Change sentences from Active into Passive:

1. He injured his arm badly last week.
2. The relatives took him to hospital.
3. He will operate the patient in two weeks.

4. Scientists introduced new methods of treatment of cancer.
5. The district doctor will prescribe you the proper treatment.
6. People often catch cold in winter.
7. The doctor made a correct diagnosis after the physical examination.
8. The doctor will discharge the patient from the hospital in two days.
9. The surgeon operated on the patient successfully.
10. Vesalius gave a proper description of the human skeleton.

Unit 2. Physiology of the heart

2.1 Answer the questions:

1. What is the rate of heart contractions regulated by?
2. How many beats per min does the heart make?

2.2 Match the English phrases with their Ukrainian equivalents. Practise their pronunciation

1. beat (beat, beaten)	['bi:t]	a) насос, накачувати
2. chamber	['tʃeɪmbə]	b) оцінювати
3. considerable	[kən'sɪdərəbl]	c) частота, швидкість
4. depend on	[dɪ'pend]	d) продовжувати
5. discharge	[dɪs'tʃɑ:dʒ]	e) виділяти
6. estimate	['estɪmeɪt]	f) камера
7. exertion	[ɪg'zɜ:(ə)n]	g) напруження, зусилля
8. prolong	[prə'lɒŋ]	h) залежити від
9. pump	[pʌmp]	k) битися
rate	[reɪt]	l) значний
total	[təʊtl]	m) хвиля
wave	[weɪv]	n) рівень

2.3 Read the following word-combinations and translate them:

Exertion: physical exertion, mental exertion, considerable exertion, extreme exertion, on exertion

Rate: heartbeat rate, pulse rate, death rate, birth rate, respiration rate, recovery rate

Considerable: considerable attention, considerable danger, considerable discomfort, considerable weight, considerable pressure, considerable effort

Total: total area, total immunity, total loss, total size, total duration, total increase

2.4 Read the text and be ready to answer the following questions:

1. How many beats per min does the heart make?
2. What is the total weight of the blood pumped by the heart daily?

3. What is systole?
4. What is diastole?
5. How many phases does each cardiac cycle consist of?
6. What is the role of ventricles?
7. How long does the heart muscle contract?
8. What does the rate of heartbeat depend on?

Work of the Human Heart

The human heart contracts from the first moment of life until the last one. The contractions of the heart pump the blood through the arteries to all the parts of the body. Scientists have determined that the total weight of the blood pumped by the heart daily is about ten tons.

The rate of heart contractions is regulated by two groups of nerve fibers. It varies in different persons and at different age.

Physiologists have determined that in the adult the heart makes from 60 to 72 beats per minute. In children the rate of heartbeat is much higher. Research work of many scientists has helped to determine that the rate of heartbeat increases depending on different emotions.

Each beat of the heart is followed by a period of rest for the cardiac muscle. Each wave of contraction and a period of rest following it compose a cardiac cycle.

Research work has given physiologists the possibility to find out that the heart muscle works or contracts about one third of the time of the person's life. The period of rest is shorter during greater physical exertion and longer when the body is at rest.

Each cardiac cycle consists of three phases: physiologists have called the first phase of short contraction of both atria — the atrial systole. They have called the second phase of a more prolonged contraction of both ventricles — the ventricular systole. The period of rest of the cardiac muscle is called the diastole.

The left ventricle discharges out the blood received by the left atrium from the pulmonary circulation through the aorta to the systemic circulation.

The blood received from the systemic circulation by the right atrium is discharged out of the right ventricle to the lungs through the pulmonary arteries.

Prolonged research work of many physiologists has given the possibility to estimate the role of the ventricles which serve as the main pump. The atria act as receiving chambers. The contraction of the atria which sends the final portion of the blood into the ventricle is considerably less.

2.4.1 Translate the following word-combinations into English. Make up your sentences with them:

Скорочення передсердь; малий круг кровообігу; серцевий м'яз; нервові волокна; загальна маса крові; хвиля скорочення: частота серцебиття; фізичне навантаження; серцевий цикл; дослідницька робота; тривале скорочення шлуночків; велике коло кровообігу.

2.4.2 Match the two columns

1. systole	a. either of the upper chambers of the heart, their muscular walls are thinner than those of the ventricles
2. atrium	b. a fluid that circulates throughout the body via the arteries and veins
3. diastole	c. The period between two contractions of the heart when the muscles of the heart relax
4. ventricle	d. a hollow muscular cone-shaped organ lying between the lungs.
5. blood	e. the period of the cardiac cycle during which the heart contracts
6. heart	f. either of the two lower chambers of the heart, which have thick walls

2.4.3 Complete the sentences using the information from the text above:

1. The atria act as
2. Each cardiac cycle consists of ... phases.
3. In the adult the heart makes ... beats per min.
4. The total weight of the blood pumped by the heart daily is about ... tons.
5. The rate of heart contractions is regulated by
6. Each beat of the heart is followed by
7. The period of rest of the cardiac muscle is called
8. The ventricles serve as

2.5 Fill the blanks with the words below. You may use each word only once.

research work, nerve fibers, 10 tons, emotions, the atrial systole, shorter, the cardiac muscle, cardiac cycle

1. The rate of heart contractions are regulated by two groups of...
2. Each beat of the heart is followed by a period of rest for...

3. Each ...consists of three phases.
4. The period of rest is ...during greater physical exertion.
5. Physiologists have called the first phase of short contraction of both atria ...
6. The rate of the heartbeat depends on different...
7. Scientists have determined that the total weight of the blood is about...
8. ...of many physiologists has given the possibility to estimate the role of the ventricles.

2.6 Translate the words in italics making sentences complete. Write them down

1. The contractions of the heart (*прокачувати кров через артерії*) to all the parts of the body.
2. (*Швидкість серцевих скорочень*) is regulated by two groups of nerve fibers.
3. In children the rate of (*серцебиття набагато вище*).
4. (*Кожен серцевий цикл складається з трьох фаз*) physiologists have called the first phase of short contraction of both atria — the atrial systole.
5. The period of rest of the cardiac muscle (*називається діастол*).
6. The blood received from the systemic circulation by the right atrium is discharged out of the right ventricle (*до легенів через легеневі артерії*).
7. (*Стиснення атрії, яка посилає кінцеву частину крові в*) the ventricle is considerably less.

2.7 Watch the video podcasts about work of the human heart

<https://www.youtube.com/watch?v=oHMmtqKgs50> and be ready to speak about anatomy and physiology of a human heart

GRAMMAR IN USE Present, Past Continuous Passive

2.8.1 Open the brackets:

1. The symptoms of illness (to discuss) by the doctors now.
2. The granny is ill so the doctor (to call) now.
3. The medicine (to prescribe) by the doctor when I came into the ward.
4. The patient (to operate) from 10.00 till 12.00 yesterday.
5. He (to Xray) at 3 o'clock yesterday.
6. He (to examine) by a doctor when I called him.
8. The patients (to examine) now.
9. The medicine (to prescribe) now.
10. His heart (to examine) from 1 till 2 yesterday.

Unit 4. Blood Groups and Blood Transfusions

4.1 Answer the questions:

1. What is blood composed of?
2. What kinds of blood cells are there?

4.2 Learn the following new words. Consult the dictionary and practise their pronunciation

1. to accumulate	накопичувати
2. to agglutinate	склеюватися
3. to clump	утворювати
4. to crack	тромбизруйнуватися,
5. to be compatible with	тріснутибути сумісним
6. consequences	наслідки
7. to determine	визначити
8. fatal	фатальний
9. to inherit	успадкувати
10.to obstruct	закупорювати, перешкоджати
11.to pave the way	прокласти шлях
12.recipient	одержувач
13.rhesus (+, -)	резус-фактор
14.to transfuse	переливати
15. vice versa	навпаки

4.4 Read the text to answer the following questions:

1. When did the Austrian scientist Karl Landsteiner discover human blood groups?
2. What can mixing of blood from two individuals lead to?
3. Why did clumping of blood occur according to Karl Landsteiner?
4. What are the two main ways to classify blood groups?
5. What are the differences in human blood due to?
6. How many genetically determined blood group systems are known today?
7. What may happen when blood groups between the donor blood and the recipient are not compatible?
8. What people are called "universal donors" and "universal receivers"?

Blood Groups and Blood Transfusions

Experiments with blood transfusions, the transfer of blood or blood components into a person's blood stream, have been carried out for hundreds of years. In 1901 the Austrian scientist Karl Landsteiner discovered human blood groups and since then blood transfusions became safer.

Mixing blood from two individuals can lead to blood clumping or agglutination. The clumped red cells can crack and cause toxic reactions. This can have fatal consequences. Karl Landsteiner discovered that blood clumping was an immunological reaction which occurs when the receiver of a blood transfusion has antibodies against the donor's blood cells.

It was Karl Landsteiner's work that made it possible to determine blood groups and thus paved the way for blood transfusions to be carried out safely. For this discovery he was awarded the Nobel Prize in Physiology or Medicine.

The two main ways to classify blood groups are the ABO (A, B, AB, O) system and the Rh (Rhesus positive +, Rhesus negative -) system. Together, they make up the eight main blood groups.

The differences in human blood are due to the presence or absence of certain protein molecules called antigens and antibodies. The antigens are located on the surface of the red blood cells and the antibodies are located in the blood plasma. Individuals have different types and combinations of these molecules. The blood group you belong to depends on what you have inherited from your parents.

There are more than 20 genetically determined blood group systems known today, but the ABO and Rh systems are the most important ones used for blood transfusions. Not all blood groups are compatible with each other that is why blood transfusions may sometimes be dangerous for individuals.

What happens when blood clumps or agglutinates?

For a blood transfusion to be successful, ABO and Rh blood groups must be compatible between the donor blood and the recipient. If they are not, the red blood cells from the donated blood will clump or agglutinate. The accumulated red cells can obstruct blood vessels and stop the circulation of the blood to various parts of the body.

You can give A blood to persons with blood group A, B blood to a person with blood group B and so on. But in some cases you can receive blood with another type of blood group, or donate blood to a person with another kind of blood group.

The transfusion will work if a person who is going to receive blood has a blood group that doesn't have any antibodies against the donor blood's antigens. But if a person who is going to receive blood has antibodies matching the donor blood's antigens, the red blood cells in the donated blood will clump.

People with blood group O Rh - are called "universal donors" and people with blood group AB Rh+ are called "universal receivers."

Rh+ blood can never be given to someone with Rh - blood, but it is possible vice versa. For example, O Rh+ blood can not be given to someone with the blood type AB Rh -. Transfusions can spread disease from donor to recipient that is why donors should be periodically tested for infectious diseases.

4.4.1 Match the columns:

a) blood stream	1. бути сумісним з
b) clumping or agglutination	2. смертельні наслідки
c) fatal consequences	3. донорська кров
d) to be awarded the Nobel Prize	4. кров'яний потік
e) presence or absence of molecules	5. бути нагородженим премією
f) to inherit from parents	6. універсальний отримувач
g) to be compatible with	7. склеювання та тромбування
h) to obstruct blood vessels	8. присутність або відсутність молекул
i) donated blood	9. успадкувати від батьків
j) universal receiver	10. закупорювати судини

4.4.2 Translate the word-combinations in bold into English:

1. Експерименти з переливання крові, передачі крові або компонентів крові до кровотоку людини, **have been carried out for hundreds of years.**

2. Змішування крові from two individuals може призвести до склеювання та утворення тромбів.

3. Karl Landsteiner відкрив that blood clumping was імунологічною реакцією which виникає when the одержувач of a blood transfusion має антитіла проти клітин крові донора.

4. The differences in human blood are due to the наявності чи відсутності певних білкових молекул called antigens and antibodies.

5. The blood group до якої ви належите залежить від what you have успадкували from your parents.

6. Not all blood groups are сумісні with each other that is why переливання крові may sometimes be небезпечним для людей.

7. Transfusions can розповсюджувати захворювання from donor to recipient that is why donors should be periodically здавати аналізи на наявність інфекційних захворювань.

4.4.3 Fill the blanks with the words below. You may use each word only once

some kidney trouble, was examined, diagnosed, in the stomach, on a scientific basis, grippe, plasters, alveoli.

1. The respiratory metabolism takes place in the ...
2. Mustard ...are prescribed for cough.
3. The patient's urine analysis indicates...
4. Our district doctor ...pneumonia and sent my mother to the hospital.
5. I had coronary complications after the...
6. While the patient ...he complained of the pains in the epigastrium.
7. Thanks to the efforts of N. I. Pirogov surgery was placed...
8. These powders relieve pains ...in case of gastric ulcer.

GRAMMAR IN USE Present, Past, Future Perfect Passive

4.4.4 Open the brackets:

1. Experiments with blood transfusions (to carry) out already.
2. His heart (to examine) by 2 o'clock yesterday.
3. Rh+ blood (to give) already to the patient.
4. Rh+ blood (to give) to the patient yet?
5. The patient already (to operate) by 12.00 yesterday.
6. The symptoms of illness (not to discuss) yet.
7. The doctor (to call) by the time I came home .
8. The medicine just (to prescribe) by doctors.
9. The patient (to operate) by the end of the week.
10. He (to Xray) by 10 o'clock tomorrow.

Change sentences from Active into Passive:

1. Karl Landsteiner discovered human blood groups by 1901.
2. Prolonged research work of many physiologists has given the possibility to estimate the role of the ventricles.
3. The right atrium has already received deoxygenated blood.
4. The surgeon had operated the patient by 3 o'clock yesterday.
5. After she had called a doctor, a child's temperature fell down.
6. He had examined blood under the microscope by 10 o'clock yesterday.
7. Students have studied all basic theoretical subjects this month.
8. The district doctor will have prescribed him the treatment by tomorrow.
9. The doctor will have discharged the patient by 3 p.m. tomorrow.
10. The surgeon has not operated the patient by 3 o'clock yet.

Unit 4. I.M. Sechenov

4.1 Answer the questions:

1. What was Sechenov famous for?
2. What did the scientist investigate?

4.2 Learn the following words and make up your sentences with them

physiology - фізіологія

psychology - психологія

findings - одержані дані

determine - визначати; встановлювати

isolate - виділяти

combine - об'єднувати(ся), сполучати

erythrocyte - еритроцит

hemoglobin - гемоглобін

accomplish – завершувати

exchange - обмінювати(ся)

oxygen - кисень

carbon dioxide - вуглекислий газ

absorption - абсорбція, всмоктування, вбирання

solution - розчин

dissolve - розчиняти(ся)

transfer - перенесення; переміщення

fluid – рідина

4.3. Read the text to answer the following questions:

1. Who was I.M. Sechenov?
2. How many scientific works did he write?
3. What were some of his research works connected with?
4. What did I.M. Sechenov find out about the blood gasses?
5. What conclusion about hemoglobin did he come to?
6. What is the accomplishment of respiratory process due to?
7. What did I.M. Sechenov prove, when he had completed his investigations of the process of absorption of carbon dioxide by the solutions of salts?
8. What is the transfer of carbon dioxide from the blood into the lungs due to?

I.M. Sechenov

I.M. Sechenov (1829-1905) was a prominent Russian scientist, the founder of Russian physiology and scientific psychology.

The range of Sechenov's scientific interests and the number of his research works are really great. 106 scientific works were written by him. In these works he included the findings which he had observed and determined before. Some of his research works were connected with the investigation of the blood gases and their role in the respiratory process.

I. M. Sechenov isolated the blood gases and found out that most of the blood gases were combined with erythrocytes. No physiologist had been able to do it before Sechenov. On the basis of his observations the scientist came to the conclusion that hemoglobin was that substance of the blood which accomplished the exchange of oxygen and carbon dioxide in the respiratory process. Physiologists of many countries who had worked on this problem before Sechenov could not estimate the role of hemoglobin in the act of respiration. So the accomplishment of the respiratory process is due to hemoglobin.

I. M. Sechenov investigated the process of absorption of carbon dioxide by the solutions of salts. When he had completed his investigations, he proved that only 2/3 of carbon dioxide was dissolved in plasma. The rest of carbon dioxide was combined with red blood cells. The transfer of carbon dioxide from the blood into the lungs was due to the law of gas diffusion from fluid into the air. When Sechenov had investigated this phenomenon, he was able to answer the question why oxygen passed into the blood from atmospheric gases during the act of respiration.

4.4 Match the words and word combinations with their definitions:

1. Findings	a) a measurement of how much oxygen and carbon dioxide is in your blood
2. erythrocyte	b) the process by which an organism takes oxygen into its body and then releases carbon dioxide from its body
3. blood gases	c) the study of the normal functioning of an organism during life and of the activities by which life is maintained
4. hemoglobin	d) the scientific study of all forms of human and animal behavior
5. psychology	e) the results of tests or investigations
6. physiology	f) red blood cell, which transports oxygen and carbon dioxide to and from the tissues
7. respiratory process	g) a conjugated (кон'югований) protein, that gives red blood cells their characteristic color

4.5 Translate the following word-combinations into English:

Завершення процесу дихання, дослідження газів крові, виділяти гази крові, поєднуватися з еритроцитами, прийти до висновку, на підставі спостережень, обмін кисню та вуглекислого газу, працювати над проблемою, оцінювати роль гемоглобіну, поглинання вуглекислого газу, розчин солі, розчинятися у плазмі, переміщення вуглекислого газу з крові до легень, закон дифузії газу, залишок вуглекислого газу, досліджувати явище.

4.6 Fill the blank with the right word from the list below:

health, polyclinics, seasonal epidemics, medical institutions, carry out, procedure, a sick-leave, experiment

1. Polyclinics serve to protect people's.....
2. Such sick persons receive....
3. There is a wide network ofin Ukraine.
4. If he has plenty of time, he will finish hisin time.
5. If the patient is relaxed, it's easy to carry on this.....
6. Nursesany of the doctor's administrations.
7. District doctors are especially busy duringsuch as flu.
8.have their own laboratories, X-ray, surgical and other departments.

4.7 Read the statements and mark them as true (T) or false (F). Prove your point. In your arguments use:

I quite agree with...; I don't think so...; I can't agree with...; from my point of view; as for me; to tell you the truth.

1. Hemoglobin was that material of the blood which accomplished the exchange of oxygen and carbon dioxide in the respiratory process.
2. I. M. Sechenov found out that most of the blood gases were combined with erythrocytes.
3. Physiologists of many countries who had worked on the problem before Sechenov estimated the role of hemoglobin in the act of respiration.
4. The range of Sechenov's scientific interests and the number of his research works are significant.
5. Sechenov could not answer the question why oxygen passed into the vital fluid from atmospheric gases during the act of respiration.
6. The performance of the respiratory process is due to hemoglobin.

4.8 GRAMMAR IN USE: Active and Passive

4.8.1 Open the brackets using correct form of the verbs:

1. About 130 scientific works (to write) by Lesgaft.

2. I (to know) this doctor since childhood.
3. We (to admit) two patients to the hospital an hour ago.
4. The physician (not to discharge) the patient form the clinic yet.
5. The nurse (not to make) an injection yet.
6. That young surgeon never (to perform) an operation.
7. This patient's relatives (to arrive) tomorrow.
8. A child usually (to brush) his teeth at 9 p.m.
9. The boy (to read) an article about hygiene for 15 minutes.
10. Inattention to personal hygiene sometimes (to lead) to diseases.
11. The patient (to have) dental checkup last week.
12. The doctor (to examine) these patients by 5 o'clock tomorrow.

Module 3. Anatomy and physiology of the nervous system

Unit 1. Anatomy of the nervous system

1.1 Answer the questions:

1. What is the main function of the nervous system?
2. What is the central nervous system formed by?

1.2 Match the English phrases with their Ukrainian equivalents. Practise their pronunciation

1. brain	a) прилеглий
2. spinal cord	b) ряд, низка
3. peripheral	c) периферійний
4. autonomic	d) свідомість
5. chain	e) ланцюг
6. ganglion	f) нервовий вузол
7. stimulus	g) стимул, подразник
8. consciousness	h) автономний
9. neuron	i) невимушений
10. movement	j) рух; пересування
11. voluntary	k) нейрон
12. surrounding	l) головний мозок
13. range	m) спинний мозок

1.3 Read and translate the text:

Anatomy of the nervous system

Nervous system is the vast network of cells specialized to carry information (in the form of nerve impulses) to and from all parts of the body in order to bring about

bodily activity. The brain and spinal cord together form the central nervous system. The central nervous system controls the voluntary muscles of the head, trunk, and the limbs, and IT is responsible for all movement in them and for all sensation in skin, muscles, bones and joints. The remaining nervous tissue is known as the peripheral nervous system and includes the autonomic nervous system which controls all involuntary muscles. It supplies all the internal organs, and is made up of nerve cells (neurons) supplying the glands and the muscular walls of the internal organs and the blood vessels. The autonomic nervous system is divided into the sympathetic and parasympathetic nervous systems.

Sympathetic nervous system has fibers that leave the central nervous system, via a chain of ganglia close to the spinal cord, in the thoracic and lumbar regions. Its nerves are distributed to the blood vessels, heart, lungs, intestines and other abdominal organs, sweat glands and salivary glands.

Parasympathetic nervous system has fibers that leave the central nervous system from the brain and the lower portion of the spinal cord and are distributed to blood vessels, glands, and the majority of internal organs. The system works in balance with the sympathetic nervous system, the actions of which it frequently opposes.

In human beings the nervous system has the additional ability to form cortical associations which increase the range of reactions. This function is obtained by all the human beings and formed upon signalization – the process in which the stimulus produces the same reactions as the stimulus with which it is associated. Such reflexes are called conditioned. And the stimuli producing reactions which don't depend on surrounding conditions are called unconditioned.

1.3.1 Answer the questions to the text:

1. What is the main function of the nervous system?
2. What is the central nervous system formed by?
3. What does the central nervous system control?
4. What does the peripheral nervous system include?
5. How are nerve cells called?
6. Where are the nerves of sympathetic nervous system distributed?
7. What works in balance with sympathetic nervous system?
8. What reflexes are called conditional?

1.3.2 Translate the following word combinations into English and make up your sentences with them:

клітинна сітка, діяльність організму, головний та спинний мозок, м'яз, що довільно скорочується, відповідати за рухи, тулуб і кінцівки, внутрішні органи,

кровоносні судини, м'язові стінки, ланцюг нервових вузлів, органи черевної порожнини, мимовільні рухи, умовний рефлекс.

1.3.3 Complete the sentences:

1. ... supplies all the internal organs, and is made up of nerve cells.
2. ... form the central nervous system.
3. ... includes the autonomic nervous system which controls all involuntary muscles.
4. ... are distributed to blood vessels, glands, and the majority of internal organs.
5. The autonomic nervous system is divided into...
6. ... are distributed to the blood vessels, heart, lungs, intestines and other abdominal organs, sweat glands and salivary glands.

1.3.4 Put questions to the underlined words:

1. Sympathetic nervous system has fibers that leave the central nervous system, via a chain of ganglia.
2. The central nervous system controls the voluntary muscles of the head, trunk, and the limbs.
3. Nervous system is specialized to carry information to and from all parts of the body.
4. Parasympathetic nervous system works in balance with the sympathetic nervous system.
5. The nervous system has the additional ability to form cortical associations.
6. The autonomic nervous system is divided into the sympathetic and parasympathetic nervous systems.
7. The remaining nervous tissue includes the autonomic nervous system.
8. This function is obtained by all the human beings and formed upon signalization.

1.4 GRAMMAR IN USE: Sequence of Tenses

1.4.1 Translate the sentences into Ukrainian paying attention to sequence of tenses:

1. The physician said that the sanatorium treatment would be helpful.
2. I didn't know you had had practice at the hospital.
3. The patient said that 2 hours before the admission he had felt an unbearable pain in epigastria area.
4. I was told that the conjunctiva was infected.
5. The doctor supposed that antibiotic treatment would be changed.

6. The patient was told that the life in subtropical climate would be very helpful.
7. Our teacher told us that Pavlov had carried out his experiments on dogs.

1.4.2 Rewrite the sentences in the past paying attention to the subordinate clauses:

1. The nurse says that the doctor is making his morning round.
2. The doctor says that the patient has been operated successfully.
3. The nurse says that the patient will be made analysis tomorrow morning.
4. The pharmacist says that drugs for injections are stored in the fridge.
5. The doctor says that the patient's lower left molar will be extracted.
6. Tommy's mother says that he complains of severe headaches.
7. Dr. Hall says that the operation has been performed successfully.

1.4.3 Change into indirect speech:

1. "I work as a rehabilitation therapist", she says.
2. She said: " I have already put the plaster on the broken leg "
3. He asked: "How many scientific works did I.M. Sechenov write?"
4. She asked : "What were some of his research works connected with?"
5. She asked:" What did I.M. Sechenov find out about the blood gasses?"
6. Dr. Hall said: "The operation has been performed successfully".
7. "We will study about nervous system next week" she said.

Unit 2. Physiology of the nervous system

2.1 Answer the questions:

1. What does nervers system consist of?
2. What processes does central nervers system control?

2.2 Match the English phrases with their Ukrainian equivalent. Consult the dictionary and practise their pronunciation

1. sensory	a) дотик; торкання
2. core	b) міркування
3. enclosed	c) закритий, обгороджений
4. interpret	d) вразливий
5. stimulus	e) стимул; подразник
6. touch	f) чутливий
7. consciousness	g) свідомість
8. medulla	h) кістковий мозок; спинний мозок
9. reasoning	i) ядро
10. afferent	j) тлумачити; пояснювати

2.3 Give the opposite meanings of the words from the right column:

Back alive

Cure allow

Dead closed

Improve deteriorate

Healthy ill

Open front

Prevent increase

Reduce kill

Smooth replace

Remove rough

2.4 Translate into Ukrainian and make your sentences with them:

a core of grey matter, average brain weight, bundles of nerves, medulla oblongata, afferent fibers, sensory centers, voluntary muscles, nerve stimulus, vital functions, reflex movement.

2.5 Read and translate the text:

Physiology of the nervous system

The brain (cerebrum) is the enlarged and highly developed mass of nervous tissue that forms the upper end of the central nervous system. The average adult human brain weights about 1400 g and is continuous below with the spinal cord. The spinal cord is the portion of the central nervous system enclosed in the vertebral column, consisting of nerve cells and bundles of nerves connecting all parts of the body with the brain. It contains a core of grey matter and is enveloped in three layers of membrane (the meninges) and extends from the medulla oblongata in the skull to the level of the second lumbar vertebra.

The brain is a complicated organ which consists of grey matter or nerve cells, and white matter or nerve fibers in the center. It contains many important nerve centers which make it not only the largest but the most important part of the brain.

The role of nervous system in our body is often compared to that of a centralized computer which controls the functioning of an entire system. This analogy explains the working of the nervous system in one of the best ways possible. The nervous system plays an important role in the smooth functioning of the different parts of our body. It is basically a complex network of cells with specialized functions. These cells communicate with each other by means of electrochemical waves. The neurons are the important components of the nervous system.

Central nervous system (CNS) is the seat of all sensation due to the bringing in of the stimuli from the tissues by afferent fibers to the sensory centers of the brain. These stimuli pass through three or more afferent neurons before they reach the sensory centers of the cerebrum, by which they are interpreted as sensations. Central nervous system controls all movements of voluntary muscles – muscles of the head, limbs and trunk. Movement is due to nerve stimulus. Movement is classified as voluntary and reflex one. The brain is the special seat of all the special senses – sight, hearing, smell, touch, and taste. The brain is the seat of all the higher mental powers – reasoning, will power, consciousness, memory, emotions, etc. The brain also controls the vital functions of the respiration and circulation, the controlling centers being located in the medulla.

2.5.1 Answer the questions to the text above:

1. What is the brain?
2. What is the average weight of the human brain?
3. What is the spinal cord like?
4. Where does the spine extend?
5. What parts does the brain comprise?
6. What is the most important part of the brain?
7. What is the role of nervous system in the body?
8. What processes does CNS control?
9. What is movement due to?

2.5.2 Complete the sentences:

1. The role of nervous system is compared to...
2. The brain forms...
3. The spinal cord is enclosed...
4. Nervous system plays an important role in...
5. ... are important components of the nervous system.
6. The cells communicate by means of...
7. The brain also controls the vital...
8. ... is classified as voluntary and reflex one.

2.6 Choose the correct option:

1. The weight of the human brain is ...
 - a) from one to two kg.;
 - b) from half a kilo to two;
 - c) from one kilo to one kilo and a half.

2. Each cell is connected to the other directly or indirectly by
 - a) neurilemma;
 - b) nerve tissue;
 - c) by nerve fibers.
 - d)
3. A constant flow of stimuli comes into the brain through
 - a) the spinal cord;
 - b) cell nucleus;
 - c) cerebral cortex;
4. The brain sends orders through ... in the spinal cord to different parts of the body.
 - a) myelin sheath;
 - b) nerve tissue;
 - c) nerve fibers;
5. The hypothalamus controls such function as
 - a) vision;
 - b) blood pressure;
 - c) hearing;
 - d)
6. Due to experimental studies it has been determined that the motor cortex controlling many body movements of the human being becomes tired
 - a) rapidly;
 - b) immediately;
 - c) slowly;
7. The brain is the centre of a wide system of
 - a) investigation;
 - b) communication;
 - c) intensification;
8. Our brain receives stimuli from
 - a) meninges;
 - b) external receptors;
 - c) cerebrospinal fluid;
9. We can eat, move, hear, see and do many things due to
 - a) orders sent by the brain;
 - b) stimuli sent to the brain;
 - c) folds, ridges and convolutions;
10. The brain has a volume of about ..
 - a. 3.5 litres
 - b. 3.2 litres
 - c. 3.7 litres

2.7 GRAMMAR IN USE: Infinitive, Complex Object, Complex Subject

2.7.1 Translate into Ukrainian paying attention to Infinitive

1. They considered him to be the best doctor in the city.
2. He was seen to enter the ward.
3. They are sure to be ill.
4. The patient is expected to be operated tomorrow.
5. She seemed not to be listening to the doctor.
6. They wanted him to operate the patient.
7. She wanted to be operated by a famous surgeon.

2.7.2 Translate into English using Infinitive

1. Було важко з ним розмовляти.
2. Він попросив, щоб йому дали знеболююче.
3. Я все це говорю, щоб мене правильно зрозуміли.
4. Він вимагав, щоб лікар виписав його з лікарні.
5. Хворобу було дуже важко вилікувати.
6. Він приніс результати аналізів, щоб показати їх нам.
7. Він був радий, що вчасно надав їм медичну допомогу.
8. Перше, що треба зробити, це викликати швидку допомогу.

2.7.3 Translate the sentences and define Complex Object:

1. I find him to be a skilled doctor.
2. She wants me to take temperature.
3. The doctor asked her to follow bed regimen.
4. She was considered to be ill with pneumonia.
5. They saw the nurse come onto the ward.
6. He felt the pain radiate into the right shoulder.
7. The patient promised to carry out doctor's administrations.

2.7.4 Translate the following sentences using Complex Object:

1. Лікар сказав, що хвороба лікується.
2. Я хочу, щоб ти не хвилювався.
3. Ми вважаємо, що він найкращий офтальмолог у цій лікарні.
4. Медсестра попросила, щоб пацієнт здав аналізи натще.
5. Вони відчули, як билосся серце пацієнта.
6. Студенти бачили, як хірург виконував операцію.
7. Деякі лікарі вважають цей спосіб лікування найбільш ефективним.

2.7.5 Translate the sentences paying attention to Complex Subject

1. He is thought to be an experienced doctor.
2. The new device is supposed to help in treatment of cancer.
3. She is known to be interested in this subject.
4. They were heard to suffer from pneumonia.
5. He seemed to know the subject well.
6. She seems to know English well.
7. We are sure to follow these rules.

2.7.6 Translate into English using Complex Subject:

1. Вважають, що ця операція є успішною.
2. Він, напевно, скоро одужає.
3. Здається, вони готові відповісти на запитання.
4. Безсумнівно, аналізи беруть вранці.
5. Кого вважають найкращим студентом на цьому курсі?
6. Повідомили, що ці ліки мають багато побічних ефектів.
7. Виявилось, що захворювання заразне.

Unit 3. REFLEXES

3.1 Answer the questions:

1. Who was the first to introduce the term “reflex”?
2. What reflexes do you know?

3.2 Match the English phrases with their Ukrainian equivalents. Practise their pronunciation

1. a reflex	a) середній мозок
2. to reflex	b) сітківка
3. patellar	c) надколінний
4. plantar	d) підошовний
5. pupillary	e) зіничний
6. luminance	f) яскравість (світла)
7. involuntary	g) мимовільний
8. instantaneous	h) миттєвий
9. consciousness	g) свідомість
10. response	k) спрямований вгору
11. afferent	l) доцентр., чутливий
12. efferent	m) відцентр., руховий
13. quadriceps	n) чотириголовий м'яз
14. extension	o) розтягнення
15. retina	p) реагувати
16. flexor	q) згинач
17. extensor	r) розгинач

18. upward	s) відповідь
19. conjunctiva	t) слизова оболонка
20. cornea	u) рогівка,роговаоболока
21. inborn	v) природжений;природн.
22. mesencephalon	w) рефлекс

3.3 Read the following words or word-combinations and translate them.

Make up sentences of your own:

to examine: an examiner, an examination, on examination, careful examination;

to move: movable, movement, moving, involuntary movement, to move around

a reflex: to reflex, the knee- jerk reflex, a pupillary reflex, conditioned reflexes

response: to response, automatic response, in response to, to be responsible for

conscious: consciousness, unconsciousness, to lose consciousness, loss of consciousness

3.4 Read and translate the text:

Reflexes

In biology, a reflex is an involuntary and nearly instantaneous movement in response to a stimulus caused by a simple nervous circuit that involves a nerve impulse passing from a sensory nerve cell to a muscle or gland without reaching the level of consciousness. Scientific use of the term "reflex" refers to a behavior that is mediated via the reflex arc, as an anatomical pathway of a reflex, consisting of an afferent (sensory) and an efferent(secretory-motor) nerve.

The word "reflex" (from Latin *reflex*, "reflection") was introduced into Biology by a 19th-century English neurologist, Marshall Hall. By reflex, Hall meant the automatic response of a muscle or several muscles to a stimulus that excites an afferent nerve. Now the term is used to describe an action that is an inborn central nervous system activity.

There are a lot of reflexes, unconditioned (unlearned) reflexes, such as patellar, plantar, pupillary, rooting reflexes and many others, but the simplest ones include swallowing, salivation, sweating, blinking, scratching, sucking (in infants), and others.

Knee- jerk reflex (patellar, kneecap, kneepan reflex) is a reflex produced by sharply tapping the patellar ligament. To test this reflex, the lower part of the leg should be relaxed (by crossing a leg at the knee) and the examiner taps the ligament below the patella with a small rubber hammer. The normal reaction is contraction of the quadriceps muscle, causing involuntary extension of the lower leg. The absence or decrease of this reflex is problematic, and known as Westphal's sign. It has a clinical significance used in determining neurodisorders or CNS diseases.

Probably the best-known reflex is the pupillary light reflex. If a light is flashed near one eye, the pupils of both eyes contract. It is a pupillary light reflex that controls the diameter of the pupil, in response to the intensity of light that falls on the retina of the eye, thereby assisting in adaptation to various levels of darkness and light. Greater intensity light causes the pupil to become smaller, whereas lower intensity light causes the pupil to become larger.

Another reflex involving the eye is known as the lacrimal reflex. When something irritates the conjunctiva or cornea of the eye, the lacrimal reflex causes nerve impulses to pass along the fifth cranial nerve and reach the mesencephalon (midbrain) stimulating the lacrimal glands.

A plantar reflex is a reflex obtained by drawing a pointed object along the outer border of the sole of the foot from the heel to the little toe. The normal flexor response is a bunching and downward movement of the toes. An upward movement of the great toe is called extensor response or Babinski reflex. The presence of the Babinski sign can identify disease of the spinal cord and brain in adults, and also exists as a primitive reflex in infants.

3.4.1 Decide if the statements are true or false. Correct the false ones

1. Reflex is a voluntary and nearly instantaneous movement.
2. The word “reflex” introduced into Biology in 12 century.
3. The absence or decrease of this reflex is known as Westphal's sign.
4. The presence of the Babinski exists as a primitive reflex in infants.
5. Knee- jerk reflex is a reflex produced by sharply tapping the patellar ligament.

3.4.2 Answer the following questions to the text :

1. What do we call a reflex in biology?
2. In what cases does a reflex occur?
3. What do we call a simple nervous circuit?
4. What does the reflex arc consist of?
5. Who was the first to introduce the term “reflex”?
6. What reflexes do you know?
7. What is the patellar reflex produced by?
8. In what case is the patellar reflex considered to be normal?
9. What is the main function of the pupillary light reflex?
10. What produces the lacrimal reflex?
11. What disease may the plantar reflex or Babinski reflex indicate?

3.4.3 Match the words from the column A with those from the column B to form word-combinations as they appeared in the text. Translate these collocations:

<i>Column A</i>	<i>Column B</i>
a) involuntary	1. pathway
b) nervous	2. reflex
c) scientific	3. hammer
d) efferent	4. object
e) anatomical	5. circuit
f) inborn	6. border
g) unconditioned	7. indication
h) rubber	8. activity
i) quadriceps	9. cord
j) intensity	10. nerve
k) pointed	11. use
l) outer	12. muscle
m) sensitive	13. light
n) spinal	14. movement

3.4.4 Translate the following word combinations into English and use them in the sentences of your own:

Простий нервовий ланцюг, мимовільна дія, у відповідь на; ступінь свідомості; поведінка; наукове звстосування; через рефлекторну дугу; анатомічний шлях; відцентрований та доцентрований нерв; збуджувати необумовлений рефлекс; чотириголовий м'яз; пупіломоторний рефлекс.

3.4.5 Match the primitive reflexes in infants with their explanations:

1. rooting	a) this reflex helps a breastfed infant find the mother's nipple. It occurs when you stroke the baby's cheek. The infant will turn toward the side that was stroked and begin to make sucking motions with the mouth.
2. parachute	b) this reflex whereby an infant is tested for motor nerve development by suspending him or her in the prone position and then dropping him or her a short distance onto a soft surface.
3. grasp	c) this reflex occurs if you place a finger on the infant's open palm. The hand will close around the finger.
4. stepping	d) this reflex occurs when the soles of infants' feet touch a flat surface and they will attempt to 'walk' by placing one foot in front of the other.
5. sucking	e) this reflex is linked with the rooting reflex and breastfeeding. It causes the child to instinctively suck anything that touches the roof of their mouth, and simulates the way a child naturally eats.

3.5 Watch video podcast “The Central Nervous System and Reflexes” <https://www.youtube.com/watch?v=tOYZupddDtE> and be ready to speak about reflexes.

3.6 GRAMMAR IN USE: Participle

Translate into Ukrainian paying attention to Participle I and II:

A) 1. Having read the book, I gave it to my friend. 2. Having done our work, we went home. 3. Being invited, he said he would not come there. 4. Having been translated, the article was published in the magazine. 5. Having reported about the patient's condition, the doctor proposed to use new medicine. 6. Having achieved considerable success in the sphere of public health, our doctors continue to fight against diseases. 7. Being asked about his friend, he answered he did not know where he was.

B) 1. Last month he described the results of research fulfilled by these scientists. 2. The data received showed good results. 3. Yesterday professor Bell delivered the lecture about some medical herbs used in their clinic. 4. This text will be translated into Ukrainian. 5. The information received helped the scientists to study this problem better. 6. At the conference they discussed the problems solved by our research group. 7. Millions of books are published every year. 8. When translated, this article will be published in one of the medical journals. 9. They have already published their article this year. 10. This scientist collected much information about his new method used in many clinics.

Unit 4. I.P. Pavlov and his investigations

4.1 Answer the questions:

1. What do you know about I.P.Pavlov?
2. What did he investigate?

4.2 Match the English phrases with their Ukrainian equivalents. Consult the dictionary and practise their pronunciation

1. remarkable	a) видатний, визначний
2. generation	b) покоління
3. to injure	c) травмувати
4. undergo	d) пройти
5. award	e) премія, нагорода
6. gastric	f) шлунковий
7. investigate	g) досліджувати

8. circumstances	h) обставини
9. ultimately	j) в кінцевому рахунку
10. involuntary	к) мимовільне
11. choleric	l) холерик
12. sanguine	м) сангвінік
13. update	п) оновлення
14. impetuous	о) стрімкий
15. equilibrated	р) врівноважений

4.3 Read and translate the word combinations into Ukrainian. Make your own sentences with them:

physiologist, to devote the life to, remarkable discoveries, from generation to generation, to win the Nobel Prize, to attend, to graduate from, research project on, the gifted young physiologist, to investigate the gastric function, psychic secretion, to conduct experiments.

4.4 Read and translate the text:

I.P. Pavlov and his investigation

Ivan Petrovich Pavlov (26 September 1849 – 27 February 1936) was a Russian physiologist known primarily for his work in classical conditioning. From his childhood days Pavlov demonstrated intellectual brilliance along with an unusual energy which he named "the instinct for research". Inspired by the progressive ideas which D. I. Pisarev, the most eminent of the Russian literary critics of the 1860s and I. M. Sechenov, the father of Russian physiology, were spreading, Pavlov abandoned his religious career and decided to devote his life to science. In 1870 he enrolled in the physics and mathematics faculty at the University of Saint Petersburg to take the course in natural science. Ivan Pavlov devoted his life to the study of physiology and sciences, making several remarkable discoveries and ideas that were passed on from generation to generation. He won the Nobel Prize for Physiology or Medicine in 1904.

Pavlov investigated the gastric function of dogs, and later children. He noticed that the dogs tended to salivate before food was actually delivered to their mouths, and set out to investigate this "psychic secretion", as he called it. Pavlov was interested in observing their long-term physiological processes. This required keeping them alive and healthy in order to conduct chronic experiments, as he called them.

These were experiments over time, designed to understand the normal functions of animals. This was a new kind of study, because previously experiments had been “acute,” meaning that the dog went through vivisection and was ultimately killed in the process.

Further work on reflex actions involved involuntary reactions to stress and pain. Pavlov extended the definitions of the four temperament types under study at the time: phlegmatic, choleric, sanguine, and melancholic, updating the names to "the strong and impetuous type, the strong equilibrated and quiet type, the strong equilibrated and lively type, and the weak type."

Conscious until his very last moment, Pavlov asked one of his students to sit beside his bed and to record the circumstances of his dying. He wanted to create unique evidence of subjective experiences of this terminal phase of life. Pavlov died of double pneumonia at the age of 86. He was given a grandiose funeral, and his study and laboratory were preserved as a museum in his honour.

4.4.1 Answer the questions to the text above:

1. What is Pavlov famous for?
2. What higher educational establishments did he graduate from?
3. What did Pavlov investigate?
4. What experiments did Pavlov’s “patients” go through?
5. How did he extend the definitions of four temperament types?
6. When did Pavlov win the Nobel Prize?
7. Why did Pavlov ask his student to record the circumstances of his dying?
8. What did he die of?

4.4.2 Find the corresponding equivalents

1. to create unique evidence	a) померти від двостороннього запалення легень
2. to go through vivisection	b) обдарований молодий фізіолог
3. the gastric function of dogs	c) довгострокові фізіологічні процеси
4. research work	d) шлункова функція собак
5. long-term physiological processes	e) створити унікальне свідчення
6. to tend to salivate	f) науково-дослідна робота
7. the gifted young physiologist	g) мимовільні реакції
8. reflex actions	h) проходити вівісекцію
9. involuntary reactions	i) бути схильним до виділення слини
10. to die of double pneumonia	j) рефлексорні дії

4.4.3 Match the terms with their definitions:

1. Pneumonia	a) The manner of thinking, behaving, or reacting characteristic of a specific person
2. temperament	b) an infection of the lungs, which can be caused by a variety of microorganisms, including viruses, bacteria, fungi, and parasites
3. chronic	c) to secrete saliva, esp. an excessive amount
4. conscious	d) Having an awareness of one's environment and one's own existence, sensations, and thoughts
5. to salivate	e) continuing a long time or recurring frequently

4.4.4 Translate the following words and word combinations into English and make your own sentences with them

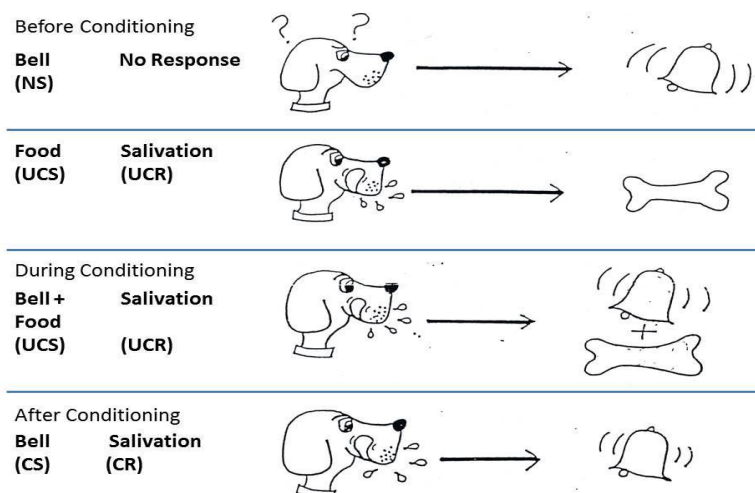
Довгострокові фізіологічні процеси, новий вид досліджень, обдарований молодий фізіолог, шлункова функція собак, фізіологічна лабораторія, вівісекція, передавати від покоління до покоління, створити унікальне свідчення, науково-дослідна робота, мимовільні реакції, голова клініки, проходити вівісекцію, бути схильним до виділення слини, рефлекторні дії, отримати Нобелівську премію.

4.4.5 Put the words from the table into an appropriate gap

response – change - salivary secretions- behaviorist - to associate - discovery –neutral - the lab assistant - behavior.

Pavlov showed the existence of the unconditioned response by presenting a dog with a bowl of food and the measuring its.....

However, when Pavlov discovered that any object or event which the dogs learnt to associate with food (such as.....) would trigger the same..... he realized that he had made an important scientific..... Pavlov knew that somehow, the dogs in his lab had learned..... food with his lab assistant. This must have been learned, because at one point the dogs did not do it, and there came a point where they started, so theirhad changed. in behavior of this type must be the result of learning. In.....terms, the lab assistant was originally a neutral stimulus. It is called unconditioned stimulus because it produces no response. What had happened was that the neutral stimulus (the lab assistant) had become associated with an.....(food).



NS – neutral stimulus

UCS/UCR – unconditioned stimulus/unconditioned response

CS/CR – conditioned stimulus/conditioned response

4.5 Watch video podcast “Pavlov's Dogs and the Placebo Effect”
<https://www.youtube.com/watch?v=GEos13Nvhv8> and be ready to speak about placebo effect

4.6 Render into English:

І.П. Павлов визначив, що темпераменти (або типи нервової системи) зумовлені певним співвідношенням трьох основних типологічних ознак — сили, зрівноваженості та рухливості нервових процесів.

На думку І.П. Павлова та його послідовників, сила нервових процесів означає здатність нервових клітин адекватно реагувати на дуже сильні подразники; зрівноваженість нервових процесів залежить від співвідношення сили процесів збудження і гальмування, а рухливість, або функціональна рухливість, визначається швидкістю переходу нервових клітин від стану збудження до гальмування і навпаки. На підставі уявлень про силу нервових процесів І.П. Павлов визначив три сильні та один слабкий тип нервової системи; при цьому сильні типи відрізнялися один від одного зрівноваженістю та рухливістю нервових процесів.

4.7 GRAMMAR IN USE

4.7.1 Open the brackets paying attention to Conditional Sentences and translate them into Ukrainian:

1. If a dog (to notice) some food he (to salivate).
2. If she (not to take) so much drugs that everning she (to be) alive.

3. If he (not to be addicted) to computer games, he (to have) happier family.
4. If she (not to fall) from the ladder, she (not to break) her leg.
5. If she (not to break) her leg so badly, she (not to be operated).
6. If you (not to eat) fast food, you (to feel) better.
7. If she (to go) to the gym, she (to be) fit.
8. If he (not to spend) so much time in front of computer he (not to be) so fat.
9. As soon as your cough (to be over), you (to be) better.
10. The patient's condition (to become) better, if he (to follow) the treatment.
11. The bleeding (not to stop) until you (to make) blood transfusion.
12. If she (not to fall) from the ladder, she (not to break) her leg last year.
13. She wishes (not to break) her leg.

4.7.2 Open the brackets using correct tense

1. The physician said that sanatorium treatment (to be) helpful in future.
2. The patient stated that four years before admission he (to lose) suddenly consciousness.
3. I thought that the life in the open air (to do) the patient a lot of good.
4. The doctor was told that the conjunctiva (to infect).
5. The patient said he never (to experience) such an acute pain before.
6. He believed that the new method of treatment (to use) extensively next year.
7. The neurologist declared that the negative extensor response or Babinski reflex (to indicate) the disease in the brain or spinal cord.

4.7.3 Translate the sentences into English paying attention to Sequence of Tenses

1. Нам розповіли, що слово «рефлекс» було введено англійським неврологом Маршалом Холлом.
2. Лікар сповістив, що у дитини відсутній рефлекс Бабінського.
3. Пацієнта проінформували, що патологічний рефлекс буде ознакою серйозних проблеми, зв'язаних зі здоров'ям.
4. Вони розповіли, що подразники потрапляють в головний мозок через спинний мозок дуже швидко, приблизно зі швидкістю 100 м. за секунду.
5. Хворий сказав, що біль відчувається тільки рано вранці.
6. Педіатр розповів, що нові методи лікування будуть використовувати в лікуванні важких випадків пневмонії.
7. Завдяки експерименту, Павлов довів, що у голодного пса кожен раз буде віділятися слюна на звук дзвіночка, навіть тоді, коли не буде їжі.

GRAMMAR GUIDE

Умовні позначення

S – підмет

S₀ – підмет в однині

S_s – підмет у множині

S₁ – підмет головного речення

S₂ – підмет підрядного речення

V₀ – дієслово в першій формі (в інфінітиві)

V₂ – дієслово в другій формі

V₃ /ed – дієслово в третій формі

V_s – дієслово в третій особі однини теперішнього часу

$\frac{?}{W}$ – питальне слово або словосполучення

THE PRESENT INDEFINITE TENSE

REMEMBER THE FOLLOWING ADVERBIALS OF TIME:

every day, every week, as a rule, usually, always, often, seldom, occasionally, etc.

S + V(e)s/o + ...

They work as doctors.

He wants to be a recreation therapist.

**S + do
does + not V₀ ...**

I do not study at Engenering Department.

This doctor does not work in this hospital.

**Do
Does + (not) S + V₀ ...?**

Do you study at IT Department?

Does Mary want to be a recreation therapist?

**$\frac{?}{W}$ + do
does + (not) S + V₀ ...?**

Where does this recreation therapist work?

Why don't you ask your doctor for a piece of advice?

Who/What	V _s ...?		Who What	does not V ₀ ...?
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Who treats this patient?

THE PAST INDEFINITE TENSE

REMEMBER THE FOLLOWING ADVERBIALS OF TIME: yesterday, the day before yesterday, last week (night, spring, year), a year (some minutes, two weeks) ago, last April, in 1978

S+ V₂/ ed...

The surgeon operated the patient yesterday.

S + did not V₀...

He did not examine the patient yesterday.

Did (not) S+ V₀...?

Did you examine the patient yesterday?
Didn't the surgeon operate him last year?

$\frac{?}{W}$ + did (not) S+V₀ ... ?

When did the surgeon operate him?
Why didn't you ask me to help you?

**Who
What + V₂/ed... ?**

Who operated him yesterday?

Who
What + **did (not) V₀ ... ?**

Who didn't visit the lecture yesterday?

THE FUTURE INDEFINITE TENSE

REMEMBER THE FOLLOWING ADVERBIALS OF TIME: tomorrow, next week (year, month), in 2035, in 5 minutes, etc

S + **shall**
will + **V₀ ...**

The doctor will examine patients tomorrow.

S + **shall**
will + **not V₀ ...**

He will not go to hospital the day after tomorrow.

Shall
Will + **(not) S + V₀ ...?**

Will you take your exam in Microbiology tomorrow?

?
W + **shall**
will + **(not) S + V₀ ...?**

When will the surgeon operate the patient?

Who
What + **will (not) V₀ ...?**

Who will operate him ?

*У підрядному реченні часу або умови після сполучників **after, before, as soon as, till, until, when, if** для вираження майбутньої дії вживається Present Indefinite Tense.*

S₁ + **shall**
will + **V₀** | **if (when, etc) + S₂ + V_{s/o} ...**

The doctor will prescribe some medicine to the patient when he examines him.

THE PRESENT CONTINUOUS TENSE

REMEMBER THE FOLLOWING ADVERBIALS OF TIME: now, at this moment

S + **am**
 is + **Ving...**
 are

They are examining a patient now.

S + **am**
 is + **not Ving..**
 are

The students are not taking the exam in Microbiology.

Am
Is + (not) S + **Ving... ?**
Are

Is he taking the exam in Microbiology now?

?
W + **is** **am**
 are + (not) S+**Ving...?**

What is he doing?

What medicine are you prescribing?

Who
What + **is (not) Ving ...?**

Who is operating now?

THE PAST CONTINUOUS TENSE

REMEMBER THE FOLLOWING ADVERBIALS OF TIME: at 4 o'clock yesterday, from 2 till 5 yesterday, the whole day yesterday, at this time yesterday, while... etc

**S + was
were + Ving**

A surgeon was operating a patient at this time yesterday.

**S + was
were + not Ving**

He was not examining patients at this time yesterday.

**Was
Were + (not) S + not Ving ...?**

Was the surgeon operating a patient at 4 o'clock yesterday?

**?
W was
were + (not) S + Ving ...?**

What patient was he operating at ten o'clock yesterday?

**Who
What + was (not) Ving...?**

Who was operating a patient from nine to twelve yesterday?

THE FUTURE CONTINUOUS TENSE

REMEMBER THE FOLLOWING ADVERBIALS OF TIME: at this time tomorrow, from 1 till 2 tomorrow, when he comes, the whole day tomorrow, etc.

**S + shall
will + be Ving ...**

She will be preparing for her exam in Microbiology the whole day tomorrow.

S + **shall**
will + not be Ving ...

He won't be examining patients at this time tomorrow.

Shall
Will + (not) S + be Ving ...?

Will you be getting ready for your exam in Microbiology at 3 o'clock tomorrow?

?
W + **shall**
will + (not) S + be Ving ...?

What patient will you be operating at nine o'clock tomorrow?

Who
What + **will (not) be Ving ...?**

Who will be making blood analysis from 8 till 10 tomorrow?

THE PRESENT PERFECT TENSE

REMEMBER THE FOLLOWING ADVERBIALS OF TIME: already, never, ever, yet, today, this week, How long?etc.

S + **have**
has + V₃ ...

She has already put the plaster on the broken leg .

S + **have**
has + not V₃ ...

He has not finished the operation yet.

Have
Has + (not) S + V₃ ...?

Has the doctor examined the patients yet?

$\frac{?}{W} + \text{have}$
 $\text{has} + (\text{not}) S + V_3 \dots?$

Why haven't you told the doctor about your symptoms?

Who
What + **has (not) V₃ ...?**

Who has operated this man?

THE PRESENT PERFECT CONTINUOUS TENSE

S + have
has + been Ving...

We have been studying Anatomy for 2 months.

S + have
has + not been Ving...

A new recreational therapist has been working in this hospital since Monday.

Have
Has + **(not) S + been Ving ...?**

Has he been treating this patient for two weeks?

$\frac{?}{W} + \text{have}$
 $\text{has} + (\text{not}) S + \text{been Ving} \dots?$

Why hasn't he been sleeping well lately?

Who
What + **has (not) been Ving ...?**

Who has been operating the patient for 2 hours?

THE PAST PERFECT TENSE

S + had Ved/3 ...

The surgeon had operated the patient by two o'clock yesterday.

S + had not+ Ved/3...

The therapist hadn't examined all the patient by ten o'clock yesterday.

Had (not) + S + Ved/3... ?

Had the surgeon operated the patient by eleven yesterday?

$\frac{?}{W}$ + had (not) S + Ved/3 ...?

How many patients had the doctor examined by ten o'clock yesterday?

**Who
What + had (not) Ved/3 ...?**

Who had put the bandage on the wound before the doctors came?

THE SEQUENCE OF TENSES

INDIRECT STATEMENTS

При перетворенні речення у прямій мові в речення у непрямій мові, форма дієслова додаткового підрядного речення змінюється відповідно до форми дієслова головного речення:

* Якщо дія, позначена дієсловом підрядного речення, відбувається одночасно з дією головного речення, у підрядному реченні вживається дієслово в *Past Indefinite* або в *Past Continuous Tense*.

* Якщо дія, позначена дієсловом підрядного речення, відбулася раніше дії головного речення, у підрядному реченні – *Past Perfect Tense*.

* Якщо дія, позначена дієсловом підрядного речення, є майбутньою стосовно дії, вираженої дієсловом головного речення, у підрядному реченні вживається дієслово в *Future-in-the-Past*.

Таблиця 1 – Пряма та непряма мова

Direct Speech	Indirect Speech
<p>Present Simple <i>“I work as a reahilitation therapist”, she says.</i></p> <p>Present Continuous <i>“He is examining the patient”, she says.</i></p> <p>Present Perfect <i>“The doctor has prescribed the medicine”, she says.</i></p>	<p>Present Simple <i>She says that she works as a reahilitation therapist.</i></p> <p>Present Continuous <i>She says he is examining the patient .</i></p> <p>Present Perfect <i>She says that the doctor has prescribed the medicine .</i></p>
<p>Present Continuous <i>“The doctor is examining the patient”, she said.</i></p>	<p>Past Continuous <i>She said (that) the doctor was examining the patient .</i></p>
<p>Present Perfect <i>“The doctor has prescribed the medicine”, she said.</i></p>	<p>Past Perfect <i>She said (that) the doctor had prescribed the medicine</i></p>
<p>Past Simple <i>“The doctor operated the patient”, she said.</i></p>	<p>Past Perfect <i>She said (that) doctor had operated the patient.</i></p>
<p>Past Continuous <i>“I was examining the patient when she rang me”, the doctor said.</i></p>	<p>Past Perfect Continuous <i>The doctor said that he had been examining the patient when she rang him.</i></p>
<p>Past Perfect <i>The surgeon said: “I had operated the patient by 11 o’clock yesterday.</i></p>	<p>Past Perfect <i>The surgeon said that he had operated the patient by 11 o’clock the day before.</i></p>
<p>Future Simple <i>“He will be back in an hour”, the doctor said.</i></p>	<p>Future-in-the-Past <i>The doctor said that he would be back in an hour.</i></p>
<p>Future Continuous <i>“The surgeon will be operating the patient in an hour”, she said.</i></p>	<p>Future Continuous-in-the-Past <i>She said that the surgeon would be operating the patient in an hour.</i></p>

	said		+ V₂/ed....	
			+ was/were Ving	
S₁ +	knew	+ (that) S₂	had been Ving	
	was sure		+ had V₃....	
			+ should	V₀....
			+ would	

При перетворенні прямої мови в непряму відбуваються такі зміни обставин часу:

Пряма мова

here

now

today

last night

yesterday

two days ago

this

these

Непряма мова

there

then

that day

the night before

the day before/the previous day

two days before/two days earlier

that

those

Щоб передати **спонукальні речення** в непрякій мові потрібно вживати дієслово з часткою **to** або **not to-** при заперечному спонуканні

The patient asked the doctor to prescribe some medicine.

The doctor asked not to breath for a minute.

Щоб передати **запитання** в непрякій мові, після питального слова (*what, where, etc.*) або сполучника (*if, whether*) потрібно поставити підмет підрядного речення, а за ним – присудок. При цьому слід дотримуватися правила узгодження часів.

He asked her when she would go to hospital.

He wanted to know if she would operate the patient the following day.

THE PASSIVE VOICE

Щоб виразити дію, спрямовану на підмет (дію в пасивному стані), після підмета потрібно поставити дієслово *to be* у відповідному часі, а за ним – третю форму дієслова.

Present Simple S +	am is are	V₃/ed....
Past Simple S +	was were	V₃/ed
Future Simple S +	shall will	be V₃/ed
Present Continuous S +	is/are/ am	being V₃/ed
Past Continuous S +	Was/ were	being V₃/ed
Present Perfect S +	have has	been V₃/ed
Past Perfect S +	had	been V₃/ed
Future Perfect S +	shall will	+ have been V₃/ed

The patients are examined every day.

The medicine was prescribed yesterday.

The patient will be operated next week.

The symptoms of illness are being discussed now.

The medicine has been prescribed today.

The patient had been operated by 12 o'clock yesterday.

The patient will have been operated by 12 o'clock tomorrow.

Present Simple S +	am is are	+ not + V₃/ed
Past Simple S +	was were	+ not + V₃/ed
Future Simple S +	shall will	+ not + be V₃/ed
Present Continuous S +	is /am/are	+ not + being+ V₃/ed
Past Continuous S +	Was /were	+ not + being+ V₃/ed
Present Perfect S +	have has	+ not + been+ V₃/ed
Past Perfect S +	had	+ not + been+ V₃/ed ...
Future Perfect S +	shall will	+ have + not + been+ V₃/ed

He is not examined every day.

The medicine was not prescribed yesterday.

The patient will not be operated next week.

The symptoms of illness are not being discussed now.

The medicine has not been prescribed today.

The patient had been operated by 12 o'clock yesterday.

The patient will have been operated by 12 o'clock tomorrow.

Am Present Simple Is + Are	(not) S + V₃ /ed ...?
Past Simple Was + Were	(not) S + V₃ /ed ...?
Future Simple Shall + Will	(not) S + be+ V₃ /ed ...?
Is/ Future Simple am/ + are	(not) S + being +V₃ /ed ...?
Past Continuous Was /Were +	(not) S+ being + V₃ /ed?
Have + Present Perfect Has	(not) S + been+ V₃ /ed ...?
Past Perfect Had +	(not) S + been + V₃ /ed ?
Future Perfect	Will + S + have been Ved/3.....?

Are the patients examined every day?
 Was the medicine prescribed yesterday?
 Will the patient be operated next week?
 Are the symptoms of illness being discussed now?
 Has the medicine been prescribed today?
 Had the patient been operated by 12 o'clock yesterday?
 Will the patient have been operated by 12 o'clock tomorrow?

Present Simple	$\frac{?}{W}$	am + is are	(not) S + V₃ /ed ...?
Past Simple	$\frac{?}{W}$	+ was were	(not) S + V₃ /ed ...?
Future Simple	$\frac{?}{W}$	+ shall will	(not) S + be V₃ /ed ...?
Present Continuous	$\frac{?}{W}$	+ am/ is/are	(not) S + being V₃ /ed ...?
Present Perfect	$\frac{?}{W}$	+ have has	(not) S + been V₃ /ed ...?
Past Perfect	$\frac{?}{W}$	+ had	(not) S + been V₃ /ed ...?
Future Perfect	$\frac{?}{W}$	will + (not) have	S + been V₃ /ed ...?

Таблиця 2 – Модальні дієслова та їх еквіваленти

Дієслово	Значення	Present	Past	Future
can	Можливість дії (здатність розумова чи фізична)	can is/am/are able to	could was able to were	will/ shall be able to
may	Дозвіл	may	might was allowed to were	will/ shall be allowed to
must	Обов'язок/ Заборона	must	-----	-----
to have to	Необхідність, зумовлена обставинами	have/has to	had to	Shall/ will have to
to be to	необхідність, обумовлена розкладом, домовленістю	is/am/are to	was/were to	-----
need	Необхідність виконання дії. Відсутність неохідності	need	needn't have Ved/3 (можна було не робити, але зробили) didn't need to (можна було не робити, і не робили)	need
should	Порада, рекомендація	should	should have V ed/3 (критика)	
ought to	моральний обов'язок	ought to	ought have V ed/3 (критика)	

can
S + may + V₀....
must

You must eat healthy food.

**S + cannot
may not
must + V₀
not**

You must not cross the street at the red light.

**Can
May + S + V₀ ...?
Must**

**Cannot
May not + S + V₀ ...?
Must not**

Can I call for the doctor?

**?
W can
may + S + V₀ ...?
must**
**?
W cannot
may not + S + V₀ ...?
must not**

Where may I have an X ray?

Who What	can + may must	+ V₀ ...?		Who What	cannot + may not must not	+ V₀ ...?
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Who can prescribe some medicine for me?

THE INFINITIVE

Інфінітив – це неособова форма дієслова, яка лише називає дію взагалі, безвідносно до того, хто її виконує і коли. У всіх своїх формах і функціях інфінітив має частку *to*.

Таблиця 3 – **Форми інфінітива**

Форми інфінітива	Active	Passive
Simple	to operate	to be operated
Continuous	to be operated	
Perfect	to have operated	to have been operated
Perfect Continuous	to have been operated	

Об’єктна інфінітивна конструкція має у своєму складі інфінітив і вживається у функції додатка. Об’єктна інфінітивна конструкція вживається після дієслів, що виражають

а) сприймання за допомогою органів чуття: *to see, to hear, to feel, to watch, to observe, to notice* (після цих дієслів інфінітив вживається без частки *to*): *Suddenly I heard her call for the doctor.* – Раптом я почув, що вона звала лікаря.

б) бажання, намір, почуття: *to want, to wish, to desire, to like, to dislike, to hate, to intend, would like*: *They wanted him to operate the patient.* – Вони хотіли, щоб він прооперував пацієнта.

в) думку, припущення, сподівання: *to consider, to believe, to think, to find, to know, to expect, to suppose*: *They considered him to be the best doctor in the city.* – Вони вважали його найкращим лікарем у місті.

г) наказ, прохання, дозвіл, пораду, примус: *to order, to ask, to request, to allow, to permit, to advise, to recommend, to cause, to force, to make, to let* (після дієслів *to let, to make* інфінітив вживається без частки *to*):

The doctor allowed the patient to have a smoke. – Лікар дозволив пацієнту покурити.

Суб’єктна інфінітивна конструкція. До її складу входить інфінітив, а вся конструкція виконує роль підмета речення.

Суб’єктний інфінітивний комплекс вживається:

а) із дієсловами *to say, to report* у пасивному стані:

He is said to have studied in Harvard. – Кажуть, що він вчився в Гарварді.

б) із дієсловами (у пасивному стані), що означають думку, припущення, сподівання: *to think, to know, to consider, to believe, to suppose, to expect*:

The patient is expected to be operated tomorrow. – Сподіваються, що пацієнта прооперують завтра.

в) із дієсловами (в пасивному стані), що виражають сприймання за допомогою органів чуття – *to see, to hear, to feel, to notice, to observe, to watch*:

He was seen to enter the ward. – Бачили, як він входив у палату.

г) із дієсловами *to seem, appear, happen, chance, turn out, prove*:

She seemed not to listen to the doctor. – Здавалося, вона не слухає лікаря.

д) із словосполученнями *to be sure, to be certain, to be likely, to be unlikely*:

They are sure to be ill. – Вони, напевно, хворі.

THE GERUND

Герундій – це неособова форма дієслова, яка має властивості іменника і дієслова. Форми герундія утворюються за допомогою закінчення *-ing*, яке додається до основи дієслова. Герундій має одну просту і три складні форми:

Таблиця 4 – Форми герундія

Форми герундія	Active	Passive
Simple	<i>operating</i>	<i>being operated</i>
Perfect	<i>having operated</i>	<i>having been operated</i>

Simple Gerund, активний і пасивний, виражає дію, що відбувається одночасно з дією, вираженою дієсловом-присудком у реченні в теперішньому, минулому або майбутньому часі:

My friend dreamed of becoming a doctor. – Мій друг мріяв стати лікарем.

Perfect Gerund, активний і пасивний, вживається для позначення дії, яка передує дії, вираженій дієсловом-присудком у реченні:

He remembers having been placed to the hospital to be operated. –

Він пам'ятає, як його помістили в лікарню, щоб прооперувати.

Герундій разом з іменником або присвійним займенником, що стоїть перед ним і позначає діяча, утворює герундіальний зворот і передає самостійну думку:

I remember my friends having helped me. –

Я пам'ятаю, що мої друзі допомогли мені.

У реченні герундій може бути підметом, частиною присудка, прямим або непрямым додатком чи означенням. Наприклад:

Learning the basics of medicine in school helped them to become good students of Medical University. – Оволодіння основами медицини в школі допомогло їм стати гарними студентами медичного університету.

Our aim is helping the community. – Наша мета – допомогати суспільству

Подібно до іменника він часто вживається з прийменниками і присвійними займенниками:

I like your idea of becoming a reacrational therapist. – Мені подобається твоя ідея стати реабілітологом.

THE PARTICIPLE (I, II)

Participle I – це неособова форма дієслова, що має властивості прикметника і прислівника. Participle I утворюється за допомогою закінчення *-ing*, яке додається до основи дієслова. Participle I має такі форми:

Таблиця 5 – **Форми дієприкметника**

Форми Participle I	Active	Passive
Simple	operating	being operated
Perfect	having operating	having been operated

Participle I відповідає українському дієприкметнику активного стану теперішнього часу та дієприслівнику недоконаного виду:

A man speaking to the doctor is the father of ill child. – Чоловік, який розмовляє із лікарем – батько хворої дитини.

He mentioned some symptomp speaking to the doctor. - Він згадав деякі симптоми, розмовляючи з лікарем.

Participle I Simple вказує на те, що дія, виражена ним, здійснюється одночасно з дією, вираженою присудком.

Participle I Perfect вказує на передування його дії дії присудка:

Having collected the results of all analisis, the doctors came to the conclusion how to treat the patient. – Зібравши результати всіх аналізів, лікарі прийшли до висновку, як лікувати пацієнта.

Participle II – це неособова форма дієслова, що має властивості дієслова і прикметника. Participle II має тільки одну форму – до правильних дієслів додається закінчення *-ed*, для неправильних дієслів – III форма дієслова.

Незалежна дієприкметникова конструкція може вводитись прийменником *with*:

The patient was standing, with his arms crossed and his head bent. - Пацієнт стояв зі схрещеними руками та опущеною головою.

CONDITIONAL SENTENCES

В англійській мові слід розрізняти такі типи умовних речень:

Умовні підрядні речення першого типу виражають реальні умови в теперішньому чи майбутньому часі для реальних дій чи фактів, виражених у головному реченні:

Таблиця 6 – Умовні речення першого типу

If-clause (hypothesis)	Main clause(result)
if + Present Simple/ Continuous/ Perfect/ Perfect Continuous	Future/ Imperative/can/may/must/should+bare infinitive

e.g. *If we know anything about the patient, we will tell you.*

Якщо ми дізнаємось щось про пацієнта, ми розкажемо тобі.

2. Умовні підрядні речення другого типу виражають неймовірні або малоймовірні припущення, які відносяться до теперішнього або майбутнього часу:

Таблиця 7 – Умовні речення другого типу

If-clause (hypothesis)	Main clause(result)
If + Past Simple/ Continuous	Would/could/might/+bare infinitive

e.g. *If I were a surgeon , I would operate him.*

Якби я був хірургом – я б прооперував його.

У головному реченні вживається допоміжне дієслово **should/would/might** і інфінітив смислового дієслова, а в підрядному реченні — форма, яка збігається з формою **Past Indefinite/Continuous**

3. Умовні підрядні речення третього типу виражають нереальні умови для дій, вказують на те, що могло б відбутися у минулому, але не відбулося:

Таблиця 8 – Умовні речення третього типу

If-clause (hypothesis)	Main clause(result)
If + Past Perfect/ Past Perfect Continuous	Would/could/might/+have+Past Participle

e.g. *If he hadn't got into the car accident yesterday, he would not have been operated.*

Якби він не потрапив до дорожньо-транспортної пригоди вчора, його б не прооперували.

У головному реченні вживається допоміжне дієслово **should/would/might/could** і перфектний інфінітив, а в підрядному реченні — форма, яка збігається з формою **Past Perfect/Past Perfect Continuous**

Таблиця 9 – Умовні речення нульового типу

If-clause (hypothesis)	Main clause(result)
If +Present Simple	Present Simple

e.g. *If you put ice on the bruise it does not hurt much.*

“I WISH” sentences

В додаткових підрядних реченнях, що залежать від дієслова **to wish**, вживається:

1) **Past Subjunctive** (співпадає по формі з Past Indefinite) та вказує на бажану дію в теперішньому чи майбутньому

e.g., *I wish I was in Hawaii now.*

— Я би я хотів, щоб я був на Гаваї зараз.

— Шкода, що я не на Гаваї зараз. (Second Conditional)

2) **Past Perfect Subjunctive** (співпадає по формі з Past Perfect) та вказує на бажану дію в минулому

e.g., *I wish you hadn't caught the flue yesterday.*

— Шкода, що ти підхопив грип вчора.

— Добре було б, якби ти не захворів на грип вчора. (Third Conditional)

3) В додаткових підрядних реченнях, які залежать від дієслова **to wish** вживається **would + infinitive**, якщо ми хочемо висловити бажання про те, щоб ситуація змінилася або зараз, або в майбутньому, хоча не дуже сподіваємось на це.

В більшості випадків зміна ситуації не залежить від особи, що висловлює побажання

e.g. *I wish he would agree to go to a doctor.*

— Я б хотів, щоб він погодився піти до лікаря. (Would + Infinitive)

References

1. Career Paths Medical. Express Publishing, 2012
1. Check your English Vocabulary for Medicine. Third Edition London 2010
2. English Medical Dictionary. Fourth edition. A and C Black Publishers Ltd. –2005.
3. English for Students of Physical Culture and Sports : учеб.-метод, пособие / Гос. образоват. учреждение высш. проф. образования ХМАО-Югры «Сургут, гос. пед. ун-т» ; авт.-сост : Ю. В. Бопп, С. В. Овчаренко. - Сургут : РИО СурГПУ, 2014. - 107 с.
4. Practise Abroad: навчальний посібник / [Ляшенко І.В. Литвиненко О.А. та ін.]. – Суми: Університетська книга, 2010.-400
5. Tests in English : Thematic vocabulary: [пособие]. – К.: Знання, 2004.– 352 с.

Internet resources

- URL: <http://www.sportcamp.gr>
URL: <http://www.topendsports.com>
URL: <http://www.trackfieldevents.com>
URL: <http://www.interestingfacts.org/category/sport-facts>
URL: http://www.clickhere.gr/olympics/olympic_history_en.html
URL: <https://www.youtube.com/watch?v=EubqKQJvykI>
URL: <https://www.youtube.com/watch?v=nUGX9zQg2rs>
URL: <https://www.youtube.com/watch?v=YBq3dn3>
URL: <https://www.youtube.com/watch?v=-lvzHyOmdUA>
URL: <https://www.youtube.com/watch?v=bu5cJfv60c>
URL: <https://www.youtube.com/watch?v=1HTStgKo-hk>
URL: <https://www.youtube.com/watch?v=Vgcx-IYABk4>
URL: <https://www.youtube.com/watch?v=Q62UwEPPnr>
URL: <https://www.youtube.com/watch?v=nBR9Rh2-Xww>
URL: <https://www.youtube.com/watch?v=9k6J6nsHc9E>
URL: <https://www.youtube.com/watch?v=f>