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АНГЛИЙСКИЙ ЯЗЫК ENGLISH IN DENTISTRY

Под редакцией профессора Л.Ю. Берзеговой

УЧЕБНИК

**2-е издание,
исправленное и дополненное**

Министерство образования и науки РФ

**Рекомендовано ГБОУ ВПО «Первый Московский государственный
медицинский университет имени И.М. Сеченова» в качестве
учебника для студентов учреждений высшего профессионального
образования, обучающихся по специальности 31.05.03 (060201)
«Стоматология» по дисциплине «Иностранный язык»**



**Москва
ИЗДАТЕЛЬСКАЯ ГРУППА
«ГЭОТАР-Медиа»
2018**

UNIT II

MAJOR ORGAN SYSTEMS

Lesson 3

Musculoskeletal System. Skull Bones. Cardiovascular System. Grammar: Participle I. Continuous Tenses

Exercise 1. Find the pronunciation of the following words in the dictionary and translate them.

oxygen, musculoskeletal, respiratory, cardiovascular, digestive, structure, organic, substance, periosteum, column, cranium, mandible, maxilla, zygomatic, curculatory, myocardial, aorta, carbon dioxide, lymph, muscle

Exercise 2. Active vocabulary. Learn the following words.

cartilage	— хрящ
connective tissue	— соединительная ткань
efficient machine	— умный (знающий) механизм
fibrous tissue	— фиброзная ткань
inward and outward	— внутренний и внешний (наружный)
ligament	— связка
lower jaw bone	— нижняя челюстная кость
musculoskeletal system	— опорно-двигательная система
periosteum	— надкостница
protective tissue	— защитная ткань
spinal column	— позвоночный столб
tendon	— сухожилие (связка)
to be composed of	— состоять из чего-либо
to be knit together	— быть соединенным
to be nourished by	— питать что-либо
to be responsible for	— отвечать за что-либо
to be supplied with	— быть снабженным чем-либо
to be supported by	— поддерживать
to consist of	— состоять из чего-либо

to convert	— превращать
to protect	— защищать
to provide	— обеспечивать, давать

Exercise 3. Translate the following word combinations before reading the text.

a remarkably complex and efficient machine, digestive food, vital internal organs, much lighter and more flexible, to be held together by a cementlike substance, to transport oxygen, it runs up and down, at the bottom, by contracting in response to nerve signals

Exercise 4. Read and translate the following text into Russian.

MUSCULOSKELETAL SYSTEM

The human body is a remarkably complex and efficient machine. It takes in and absorbs oxygen through the respiratory system. Then the oxygen-enriched blood is distributed through the cardiovascular system to all tissues. The digestive system converts digestible food to energy and disposes of the rest. The skeletal-muscular system gives form to the body, and covering almost the entire mass is the skin, the largest organ of the body. The science of the structure of this complicated «machine» is called anatomy.

One of the major systems is the *skeletal-muscular* system. The body is supported and given shape by this structure, consisting of more than 200 bones and the muscles and tendons which are connected to them. They are strong but can bend at their joints. They also serve as a shield, protecting the vital internal organs from injury.

Bones are as strong as steel but much lighter and more flexible. They are composed of minerals, organic matter, and water, held together by a cementlike substance called *collagen*, and are filled with red and yellow bone marrow. The red marrow produces the red blood cells used throughout the body to transport oxygen, while the yellow marrow consists primarily of fat cells. A tough membrane called the *periosteum* covers most of the bone surface and allows bones to be nourished by blood.

A major bone structure in the body is the vertebral (spinal) column. It runs up and down the back and protects the spinal cord, where many of the major nerves are located. It is composed of bony vertebrae which are held together by ligaments of connective tissue and separated from each other by spinal discs. At the top of the vertebral column is the skull, which surrounds and protects the brain. The bony structure of the head and face is called the skull. It consists of 22 bones. The main parts are the cranium and the facial skeleton with the movable lower jaw bone (mandible) which enables man to talk and eat. The

main bones of the face are the mandible, two upper jaw bones, two malar, two nasal, two lacrimal, two palate bones. All of these bones except the mandible are closely knit together.

Attached to the vertebral column below the neck are the 12 pairs of ribs, comprising the rib cage. At the bottom is the sacrum, which connects the vertebral column to the pelvis. Bones are united by joints and held together by ligaments.

Muscles are special fibrous tissues found throughout the body. They control movement and many organic functions by contracting in response to nerve signals. Skeletal muscles are called voluntary because they can be consciously controlled. They are attached to bones by tough fibrous tissues called tendons. Other muscles, such as the stomach muscles and the heart, are involuntary and are operated automatically by the central nervous system.

Healthy muscles are said to have good muscle tone. Not all muscles are healthy, however, for various ailments may affect them. An inflammation of a tendon (tendonitis), of the protective sac at a joint (bursitis), or of a muscle itself (myositis) may occur. When a muscle becomes fatigued, it sometimes contracts violently and painfully. This condition is known as *cramping*. Too much strenuous activity may produce a *strain*.

VOCABULARY EXERCISES

Exercise 1. Give English equivalents to the following words.

опорно-двигательная система, обогащенная кислородом кровь, костный мозг, плотная оболочка, защищать позвоночный столб, в ответ, сознательно, центральная нервная система, здоровые мышцы, поражать (болезненным процессом), воспаление, с трудом и болезненно.

Exercise 2. Make up sentences of your own using the following words and phrases.

science of the structure, to be called, bones and muscles, as strong as steel, to be composed of minerals, organic matter and water, red blood cells, facial skeleton, movable lower jaw bone, to talk and eat

Exercise 3. Match the half-sentences in column A with the half — sentences in column B to make correct and complete sentences.

A

1. The human body is...
2. The musculoskeletal system...
3. One of the major systems...

4. Bones are composed of...
5. A major bone structure in the body...
6. At the top of the vertebral column...
7. Bones are united by...
8. Muscles control...

B

1. ...joints and held together by ligaments.
2. ...minerals, organic matter, and water, held together by collagen.
3. ...gives form to the body.
4. ...movement and many organic functions.
5. ...a remarkably complex and efficient machine.
6. ...is the vertebral (spinal) column.
7. ...is the musculoskeletal system.
8. ...is the skull, which surrounds and protects the brain.

Exercise 4. Answer the questions to the text «Musculoskeletal System».

1. What is the human body?
2. What is the skeleton?
3. How many bones does the skeleton consist of?
4. What is the major bone structure in the body?
5. Where is the skull situated?
6. What is the hardest tissue in the body?
7. What bones of the face do you know?
8. What are some important functions of the skeleton?
9. What is a bone composed of?
10. Which tissues enable the body to move?
11. What is the difference between muscles and tendons?
12. What is the function of the muscles?
13. What is anatomy?

Exercise 5. Fill in the blanks with suitable words from the active vocabulary.

1. Healthy muscles are said to have _____.
2. Too much strenuous activity may produce _____.
3. Skeletal muscles are called _____ because they can be consciously _____.
4. At the bottom is the _____, which connects the vertebral column to the _____.
5. All of these bones except the _____ are closely knit together.
6. The bony structure of the _____ and _____ is called the skull.

Exercise 6. Read and translate into Russian the text «Skull» and do the exercise that follow it.

SKULL

Skull is the skeleton of the head and face, which is made up of 22 bones. It can be divided into the cranium, which encloses the brain, and the face including the lower jaw (mandible). The cranium consists of eight bones. The frontal, two parietals, occipital, and two temporals form the vault of the skull (calvaria) and are made up of two thin layers of compact bone separated by a layer of spongy bone. The remaining bones of the cranium — the sphenoid and ethmoid — form part of its base. The 14 bones that make up the face are the nasals, lacrimals, inferior nasal conchae, maxillae, zygomatics, and palatines (two of each), the vomer, and the mandible. All the bones of the skull except the mandible are connected to each other by immovable joints. The skull contains cavities for the eyes and nose and a large opening at its base (foramen magnum) through which the spinal cord passes.

Find the English equivalents in the text to the words and word combinations below:

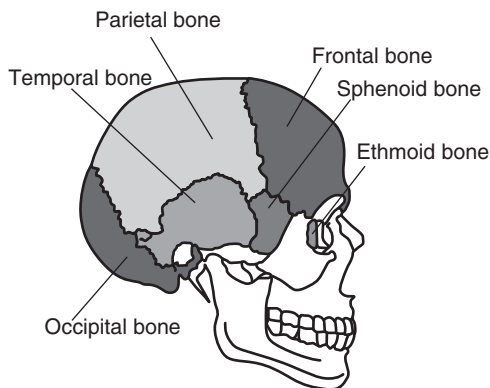
скелет головы и лица, закрывать (защищать) мозг, состоять из, включая нижнюю челюсть, плотная (твердая) кость, губчатая (пористая) кость, за исключением нижней челюсти, неподвижный сустав, полости для глаз и носа.

Exercise 7. Read and translate the following text into Russian. Below are detailed diagrams of the skull bones (cranial and facial bones). Learn the names of the bones and skull bones anatomy through the skull bones diagrams.

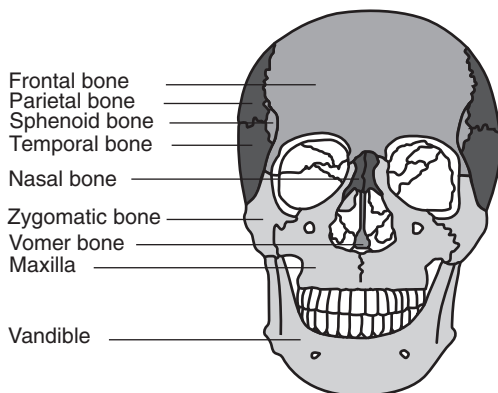
SKULL BONES.

CRANIAL AND FACIAL BONES

The human skull, scientifically known as the cranium, consists of 22 bones. The skull can be broken into two regions, the cranial section and the facial section. The cranial bones consist of the bones in the top of the skull while the facial bones consist of the bones that make up your face. The skulls primary functions are protection of the brain and support of the face. In the skull sinal cavities can be found. Although the function of these cavities is still not definitively known, it may be that the sinuses function is decreasing the weight of the skull while maintaining strength.

Cranial Bones**List of all Cranial Bones**

- frontal bone
- parietal bone (2)
- temporal bone (2)
- occipital bone
- sphenoid bone
- ethmoid bone

Facial Bones**List of all Facial Bones**

- mandible
- maxilla (2)
- palatine bone (2)
- zygomatic bone (2)
- nasal bone (2)
- lacrimal bone (2)
- vomer
- inferior nasal conchae (2)

Exercise 8. Translate the following sentences into Russian.

1. The human body is a remarkably complex and efficient machine.
2. The science of the structure of complicated «machine» is called anatomy.
3. Bones are as strong as steel but much lighter and more flexible.
4. Healthy muscles are said to have good muscle tone.
5. Too much strenuous activity may produce a strain.
6. Human anatomy is the study of the structure and organs of the human body.
7. System is a group of structures or organs related to each other and working together to perform certain functions.

8. Muscle is a tissue composed of fibers that shorten by contraction to produce movement.
9. Tendon is a fibrous connective tissue that attaches muscles to bones and to other muscles.
10. All the bones of the skull except the mandible are connected to each other by immovable joints.
11. The skull primary functions are protection of the brain and support of the face.

Exercise 9. Before reading the text «Cardiovascular (Circulatory) System» learn the active vocabulary to it.

blood vessels	— кровеносные сосуды
cardiovascular system	— сердечно-сосудистая система
chamber	— полость (камера) сердца
contraction of the heart	— сокращение сердца
heartbeat	— сердцебиение
myocardial tissue	— ткань, относящаяся к сердечной мышце
pH balance	— физиологический баланс
process of circulation	— процесс кровообращения
pulmonary veins	— легочные вены
to distribute	— распределять, распространять
to pump the blood	— посылать кровь (по кровеносным сосудам)

Exercise 10. Read and translate into Russian the following text and answer the questions.

CARDIOVASCULAR (CIRCULATORY) SYSTEM

The cardiovascular system is sometimes also referred to as the circulatory system, although they are not quite the same thing. The term cardiovascular speaks to the two parts of the system: *cardio* meaning heart and *vascular* meaning vessels. Anatomically, the major structures are the heart and blood vessels (arteries, veins, capillaries), but it is difficult to think of this system without including reference to the lungs (part of the respiratory system). The main function of the cardiovascular system is to distribute blood through blood vessels throughout the body. The main function of the heart is to pump the blood (to function as the engine of the cardiovascular system), beginning the process of circulation.

The heart consists of myocardial tissue and is divided into four chambers: two atria and two ventricles. The left and right atria are the two upper chambers of the heart, the left and right ventricles the two lower chambers. Blood that is high in oxygen (oxygenated) flows into the left atrium from the lungs through the pul-

monary veins. The left atrium then contracts to pump a supply of blood to the left ventricle. The aorta is found in the left ventricle. It branches into a complex series of arteries that bring oxygenated blood to all of the organs of the body. When the blood reaches the capillaries, it delivers oxygen and in exchange picks up the waste product carbon dioxide to carry away through veins back to the heart. This blood in the veins empties first into the vena cava (the main vein in the human body), which then carries it to the right side of the heart. Next, this blood is pumped through the pulmonary artery to the lungs where it exchanges the carbon dioxide waste for a new supply of oxygen. The cycle then repeats. This cycle is powered by the contraction of the heart, which is caused by electrical impulses within the heart. The contraction of the heart is known as the heartbeat.

The circulatory system is a subsystem of the cardiovascular system. It concerns itself with blood and the function of blood, but it is difficult to think of the circulatory system without thinking about the lymphatic system. They are essential to each other. Lymph cells assist in cleansing the blood of dead cells and bacteria. Blood is the mode of transport for lymph, nutrients, hormones, electrolytes, gases (oxygen and carbon dioxide), water, and wastes to and from cells. The capillaries are the site of this exchange between the blood and the tissues that surround them. Blood also helps stabilize body temperature and the natural *pH* balance.

In summary, the cardiovascular system is most often thought of in terms of the heart, blood vessels, and the lungs. The circulatory system is most often thought of as the blood vessels, blood, lymph, and the heart.

Questions:

1. What is another name for the circulatory system?
2. What is the main function of the cardiovascular system?
3. What are the major structures of the cardiovascular system?
4. What does the heart consist of?
5. What is the main function of the heart?
6. What is a heartbeat?
7. What is the function of the circulatory system?
8. What is blood?
9. What are capillaries? Which system do they belong to?

Exercise 11. Many medical words also have a related nonmedical meaning.

Answer the following questions.

1. What is the general meaning of the word **atrium**? What does it mean in relation to the heart?
2. What is the general meaning of the word **ventricle**? What does it mean in relation to the heart?

Exercise 12. Use your active vocabulary and write a sentence or two by combining these words in a meaningful way.

men	muscles	injury	lifting pain
relief	ice	heavy	back

Exercise 13. Continue to explain your new vocabulary by completing the following multiple-choice questions.

1. Choose the best answer to describe the function of the musculoskeletal system. It
 - a) helps you stand up;
 - b) allows you to walk;
 - c) supports the skeleton;
 - d) allows you to stretch.
2. Pathologic fractures occur as a result of
 - a) diseases or conditions that cause bones to break spontaneously without an injury or trauma;
 - b) brain disease;
 - c) old age;
 - d) sickness.
3. A complete head-to-toe assessment begins, of course, at the patient's head. It will include
 - a) general appearance;
 - b) level of consciousness;
 - c) disorientation;
 - d) both (a) and (b) are correct;
 - e) all of the above.
4. The head-to-toe assessment is designed to
 - a) systematically assess the patient's physical status;
 - b) systematically observe the patient;
 - c) systematically assess postoperative distress;
 - d) none of the above;
 - e) only (a) and (b).
5. The head-to-toe assessment includes the following.
 - a) objective reports and data collected by nurses;
 - b) objective and subjective assessments by nurse and patient;
 - c) subjective reports from patient and family members;
 - d) none of the above.

GRAMMAR EXERCISES

Exercise 1. Put the verb in the correct form, simple or continuous.

1. These patients _____ (wait) for you downstairs.
2. Dr. Smith _____ (speak) on the phone with his patient.
3. Nurses always _____ (help) the doctors to perform an operation.
4. Dr. Black _____ (speak) three languages.
5. Good nurses _____ (look) after sick patients very attentively.
6. Maria is in Britain at the moment. She _____ (learn) English.
7. I always _____ (go) to bed before midnight.
8. John isn't lazy. He _____ (work) very hard most of the time to learn anatomy.
9. My English _____ (improve) slowly. It's not bad.
10. Can you hear those people? What _____ they _____ (talk) about?
11. I _____ (think) of giving up my job at Surgery Department.
12. I _____ (see) the dentist tomorrow morning.
13. I used to drink a lot of coffee but these days I _____ (prefer) tea.
14. I knew Kate was very busy, so I _____ (disturb) her.
15. It was a funny situation but nobody _____ (laugh).
16. I was in a hurry, so I _____ (have) time to phone you.
17. Jane _____ (wait) for me when I _____ (arrive).
18. We were in a very difficult position. We _____ (know) what to do.
19. I _____ (walk) home when I met Dave.

Exercise 2. Translate the following sentences into Russian. Determine the tense forms of the predicates.

1. Please, don't make so much noise. I'm working.
2. Let's go out. It isn't raining any more.
3. Vegetarians don't eat meat.
4. It takes me an hour to get to work. How long does it take you?
5. Don't put the dictionary away. I'm using it.
6. She told me her name but I don't remember it now.
7. The bed was very uncomfortable. I didn't sleep well.
8. I haven't seen Sue for ages. When I last saw her, she was trying to find a job in London.
9. When I was young, I wanted to be a dentist.

Exercise 3. Translate the sentences into Russian paying attention to the Participle I.

1. Hypertension is a wide spread disorder affecting people of all ages.
2. The doctor performing the operation is a well known surgeon.

3. The land stretching away to the left belongs to Dr. Black.
4. The students attending the lecture of anatomy decided to go to dissecting-room.
5. The man operating the equipment was dressed in protective clothing.
6. The girl waiting for the bus is my sister.
7. The eye hospital has recently obtained new equipment allowing far more patients to be treated.
8. I ran through the crowd of people hurrying to get to work.

SPEECH EXERCISES

Exercise 1. Read the text «Musculoskeletal System» again, and then, without looking into it, complete the phrases.

1. One of the major system is the s _____ -m _____ system.
2. Bones are as s _____ as s _____ but much lighter and more f _____.
3. A major bone s _____ in the body is the v _____ c _____.
4. At the top of the vertebral column is the s _____.
5. Bones are united by j _____ and held together by l _____.
6. M _____ are special fibrous t _____ found throughout the body.
7. The main bones of the face are the m _____, two upper j _____ bones, two m _____, two n _____, two l _____, two p _____ bones.

Exercise 2. Read the text «Skeletal System» and summarise it using the introductory phrases.

SKELETAL SYSTEM

The skeleton comprises the first part of the musculoskeletal system — the bones. There are 206 bones in the human body and they comprise the skeleton. The skeletal system is responsible for supporting the weight of the body, for posture, and for gait. Muscles comprise the second part of the system. They are responsible for most body movements. There are three main types of muscle — skeletal, smooth, and cardiac. Skeletal muscles are sometimes called striated muscles because of their striped appearance when seen under the microscope. They attach to bones of the skeleton and are under voluntary control. This allows us to engage in physical activities such as walking, running, smiling, winking, and grasping. Skeletal muscles also allow us to manipulate things like holding a pencil or buttoning a shirt. Smooth muscles comprise the walls of organs such as the liver, spleen, and kidneys. They are responsible for the transport of nutrients and other materials through the body. Smooth muscles are not under voluntary control. We cannot make them work. Cardiac muscle is also involuntary. This

particular type of muscle allows the heart to pump and accommodate (respond) to changes in the entire body that require it to pump faster or more slowly.

The text deals with...

It is said that...

I'd like to note...

In addition I'd like to mention that...

Summing it up...

It may be concluded that...

Exercise 3. Read and translate into Russian the text without a dictionary. Summarise it.

Man's skeleton was formed more than million years ago. The skeleton is a tower of bones knit together by joints so that man can run, jump and bend. 206 bones protect the vital organs from injuries. The skeleton performs functions of support, movement and protection. The supporting function consists in supporting all the organs and giving the body a definite form and position. The skeleton, together with the muscles, constitute the motive apparatus.

The human skeleton may be divided into the skeleton of the trunk, upper extremities, lower extremities and the skull.

The bony part of the head is called the cranium or skull. The skull has a cavity which contains the brain. The bones of the skull form the mouth and nasal cavities. In the mouth cavity there are accessory organs of the digestive system.

Exercise 4. Mark each statement below T (true) or F (false). Correct the statements that are false.

1. The skeletal-muscular system converts digestible food to energy and disposes of the rest.
2. The red marrow produces the white blood cells used to transport oxygen throughout the body.
3. The most important muscle in the body is the heart.
4. Hemoglobin is a protein found in white blood cells.
5. Capillaries are secretions which help with the digestion of food.
6. The pulse is a measure of the heartbeat.
7. The vertebral column is composed of a number of flexible dentrites (отростки).
8. The heart contracts at an average rate of 18 times per minute.

Exercise 5. Speak on the following.

1. Components of the Musculoskeletal System.
2. Skull Bones.
3. Heart of the Human Body. Structure and Functions.