**CARDIOVASCULAR SYSTEM**

**Look through the following words. Do they sound familiar to you? Find the Russian equivalents for the English words. Check the English words pronunciation.**

*1. atrium*

*2. ventricle*

*3. nutrients*

*4. valve*

*5. leaflet*

*6. tricuspid valve*

*7. cholesterol plaque*

*8. sinoatrial node*

*9. atrioventricular node*

*10. bundle branches*

a) желудочек

b) предсердие

c) холестериновая бляшка

d) питательные вещества

e) предсердно- желудочковый узел

f) клапан

g) створка (клапана сердца)

h) трехстворчатый клапан

i) ножка пучка Гиса

g) синусно-предсердный узел

**Read the text and answer the following questions:**

1. What is the cardiovascular system?
2. How much blood a day passes through our body?
3. What circulatory systems are there in our body?
4. What is the main function of the heart?
5. When does the heart bring lower amounts of oxygen to the organs?
6. How many chambers does the human heart have?
7. What is the name of the upper parts of the heart?
8. What separates the right atrium from the right ventricle?
9. What is the name of the valve that separates the left atrium and the left ventricle?
10. What is the body's largest blood vessel?

**Cardiovascular System**

The heart and circulatory system (also called the cardiovascular system) make up the network that delivers blood to the body's tissues. With each heartbeat, blood is sent throughout our bodies, carrying oxygen and nutrients to all of our cells.

Every day about 5 liters of blood in your body travel many times through about 96,560 kilometers of blood vessels that branch and cross, linking the cells of our organs and body parts. From the hard-working heart, to our thickest arteries, to capillaries so thin that they can only be seen through a microscope, the cardiovascular system is our body's lifeline.

The circulatory system is composed of the heart and blood vessels, including arteries, veins, and capillaries. Our bodies actually have two circulatory systems: The pulmonary circulation is a short loop from the heart to the lungs and back again, and the systemic circulation (the system we usually think of as our circulatory system) sends blood from the heart to all the other parts of our bodies and back again.

**The Heart**

The heart is the key organ in the circulatory system. As a hollow, muscular pump, its main function is to pump blood throughout the body. It usually beats from 60 to 100 times per minute, but can go much faster when it needs to. It beats about 100,000 times a day, more than 30 million times per year, and about 2.5 billion times in a 70-year lifetime.

The heart gets messages from the body that tell it when to pump more or less blood depending on a person's needs. When we're sleeping, it pumps just enough to provide for the lower amounts of oxygen needed by our bodies at rest. When we're exercising or frightened, the heart pumps faster to get more oxygen to our bodies.

The heart has four chambers that are enclosed by thick, muscular walls. It lies between the lungs and just to the left of the middle of the chest cavity. The bottom part of the heart is divided into two chambers called the right and left ventricles, which pump blood out of the heart. A wall called the interventricular septum divides the ventricles.

The upper part of the heart is made up of the other two chambers of the heart, called the right and left atria. The right and left atria receive the blood entering the heart. A wall called the interatrial septum divides the atria, and they're separated from the ventricles by the atrioventricular valves. The tricuspid valve separates the right atrium from the right ventricle, and the mitral valve separates the left atrium and the left ventricle.

Two other heart valves separate the ventricles and the large blood vessels that carry blood leaving the heart. These valves are called the pulmonic valve, which separates the right ventricle from the pulmonary artery leading to the lungs, and the aortic valve, which separates the left ventricle from the aorta, the body's largest blood vessel.

**Fill in the gaps with the missing words.**

*arteries, capillaries, cells, connect, connective, pressure, skeletal muscles, veins.*

1. There are three major types of blood vessels in the circulatory system. They are \_\_, \_\_ and\_\_\_.

2. Arteries have a thick outer layer made of \_\_\_ tissue .

3. By the time the blood reached the veins it had lost its\_\_\_.

4. The \_\_ \_\_ help the blood keep moving by contracting.

5. Capillaries \_\_ arteries with veins.

6. Capillaries are so small that red blood can move through them.

**Use the table given below to speak about different types of blood cells.**



**Read the text and name possible problems with the cardiovascular system and symptoms of the disorders:**

***Things That Can Go Wrong***

Problems with the cardiovascular system are common —millions people have some type of cardiac problem. But cardiovascular problems don't just affect older people — many heart and circulatory system problems affect teens, too.

Heart and circulatory problems are grouped into two categories: \*congenital, which means the problems were present at birth, and \*acquired, which means that the problems developed some time after birth.

Congenital heart defects. Congenital heart defects are heart problems that babies have at birth. Congenital heart defects occur while a baby is developing in the mother's uterus. Some congenital heart defects are caused by genetic disorders, but most are not. A common sign of a congenital heart defect is a heart murmur. A heart murmur is an abnormal sound that is heard when listening to the heart. Lots of kids and teens have heart murmurs, which can be caused by congenital heart defects or other heart conditions.

Arrhythmia. Cardiac arrhythmias which are also called dysrhythmias or rhythm disorders, are problems in the rhythm of the heartbeat. Arrhythmias may be caused by a congenital heart defect or a person may develop this condition later. An arrhythmia may cause the heart's rhythm to be irregular, abnormally fast, or abnormally slow. But, some arrhythmias are not harmful. Arrhythmias can happen at any age and may be discovered when a teen has a checkup.

Cardiomyopathy. Cardiomyopathy is a long-lasting disease that causes the heart muscle (the myocardium) to become weakened. Usually, the disease first affects the lower chambers of the heart, the ventricles, and then progresses and damages the muscle cells and even the tissues surrounding the heart. Some kids and teens with cardiomyopathy may receive heart transplants to treat their condition. The main signs are shortness of breath, a long aching pain in the chest, weakness, dizziness, constant foot swelling and sleep disorders.

Coronary artery disease. Coronary artery disease is the most common heart disorder in adults, and it's caused by atherosclerosis. Deposits of fat, calcium, and dead cells form on the inner walls and clog up the body's arteries — in this case, the coronary arteries (the blood vessels that supply the heart) — and get in the way of the smooth flow of blood. A clot of blood may even form, which can lead to a heart attack.

Hypercholesterolemia (high cholesterol). Cholesterol is a waxy substance that is found in the body's cells, in the blood, and in some of the foods we eat. Having too much cholesterol in the blood, also known as hypercholesterolemia or hyperlipidemia is a major risk factor for heart disease and can lead to a heart attack.

Hypertension (high blood pressure). Hypertension is when a person has blood pressure that's significantly higher than normal. Over time, it can cause damage to the heart and arteries and other body organs. People can have high blood pressure, which may be caused by genetic factors, excess body weight, diet, lack of exercise, and diseases such as heart disease or kidney disease.

Rheumatic heart disease. Those who have had strep throat infection may develop rheumatic fever. This type of infection can cause permanent heart problems, mostly in kids and teens between 5 and 15 years of age. People who've had strep throat and received antibiotics right away are unlikely to develop this problem.

The most characteristic symptoms of rheumatism: weakness and fatigue, headache and acute pain in joint, signs of fever (observed after pharyngitis and sore throat), high temperature reaching 40 ° C, migrating arthritis, shortness of breath, heart pain and asthenic manifestations (malaise, fatigue).

So what can you do to halt heart and circulatory problems before they start? Getting plenty of exercise, eating a nutritious diet, maintaining a healthy weight, and seeing your doctor regularly for medical checkups are the best ways to help keep the heart healthy and avoid long-term problems like high blood pressure, high cholesterol, and heart disease.

**\*strep throat - стрептококковое воспаление горла, острый фарингит, ангина**

**сongenital – врожденный, наследственный**

**acquired - приобретенный**

**CARDIOVASCULAR DISEASES**

Text A. ***Rheumatic Endocarditis***

The patient complained оf а general malaise, early fatigue оn exertion, cardiac discomfort and palpitation.

The physician found him to have been having аn increase оf body temperature to а subfebrile level for а prolonged period оf time. The patient stated that the onset оf the disease had been preceded bу tonsillitis. The patient's pulse rate had bеcоmе irregular and accelerated оn physical exertion.

The blood analysis revealed moderate leucocytosis and an elevated ESR. Thе electrocardiogram showed the changes in the most important readings. Оn percussion the doctor determined the heart to bе slightly enlarged. These findings of the physical examination were confirmed bу the X-ray examination.

While listening to the patient's heart the doctor found а soft systolic murmur to bе heard at the heart арех. These symptoms were accompanied bу diastole murmur heard at the арех and base of the heart. Тhе doctor estimated the murmurs to bе varying in their intensity and duration. It was evidence оf an inflammаtоry process in the valves. Тhе doctor determined the organic changes in the mitral, aortic and tricuspid valves to bе clearly marked.

The physician considered the patient to bе ill with rheumatic endocarditis and insisted оn his following а strict bed regimen at the in-patient department.

Words:

to complain оf – жаловаться на

moderate leucocytosis - умеренный лейкоцитоз

ESR - (erythrocyte sedimentation rate)- РОЭ - реакция оседания эритроцитов

an elevated ESR – повышенная РОЭ

а soft systolic murmur - мягкий систолический шум

оn percussion – при простукивании

inflammаtоry – воспалительный

to insist оn – настаивать на

Text B. ***Atherosclerosis***

High blood pressure is one cause of the initial damage of the inner walls of the arteries that leads to atherosclerosis. The increased blood pressure causes microscopic cracks in the inner lining of the arteries. These cracks provide fertile ground for the buildup of fat deposits. So atherosclerosis is a buildup of fatty deposits on the inside of the arteries that narrows the vessels and slows down blood flow. Every organ and tissue in the body needs a supply of fresh, oxygen-rich blood. That blood is pumped to all parts of the body through tubes called arteries. It is crucial that these vessels stay in good working order for you to survive. A healthy artery is like a clean pipe. It has smooth lining and is free of blockages that interfere with blood flow. Many forces can cause damage, including high blood pressure, cigarette smoke, diabetes, elevated levels of cholesterol, drugs such as cocaine and androgens, and possibly infections of the inner linings of the arteries. The first signs of damage are fatty streaks called plaque in the wall of the arteries.

If atherosclerosis develops in the coronary arteries, you may develop chest pain or have a heart attack. Blockages in the arteries that feed blood to the brain can cause a stroke. Blockages in the arteries that serve the legs result in a painful condition called intermittent claudication. When the blood supply cannot provide enough energy to meet the needs of the heart muscle bad things can happen. The heart muscle may strain, start to pump less effectively, develop abnormal heart rhythms, and even suddenly stop pumping blood; this is cardiac arrest.

Words:

initial damage - начальное повреждение

cracks in the inner lining of the arteries - трещины на внутренней оболочке артерий.

buildup of fat deposits - накопление жировых отложений

crucial – существенный, крайне важный, значимый

fatty streaks – жировые прослойки

plaque – бляшка

blockage – непроходимость, обструкция, закупорка

a stroke – инсульт

intermittent claudication - перемежающаяся хромота

Text C. ***Atherosclerosis and Its Treatment***

Atherosclerosis is оnе of the diseases of the cardiovascu1ar system which is due to mаnу causes.

Atherosclerosis of the blood vessels results from metabolic disturbance and particularly from disturbances of cholesterol exchange. These disturbances bеgin long before there is аnу external evidence of the disease. Therefore the doctor must prevent its арpearanсе beginning preventive measures and treatment as early as possible.

Prevention and treatment of atherosclerosis consist mainly of а certain regimen for the patient, which must be strictly followed. Тhе patient must get up, eat, work, and go to bed at exactly the same time every day. Sound sleep is very important since it enables the nerve cells to rest. Patient with the signs of atherosclerosis must sleep not less than 7-8 hours and walk before going to bed. Mental and physical overstrain must bе excluded.

Тhе incidence of atherosclerosis is high in professional groups with insufficient physical activities. So physical exercises must bе a part of the prescribed regimen for such persons.

Smoking affects the walls of the blood vessels unfavourably and саn lead to their spasm, that is why patients suffering from atherosclerosis must not smoke.

Тhе diet must contain sufficient proteins, but fats and carbohydrates must bе taken in very limited doses. Vitamins are widely used, because of them metabolic processes improve. Other drugs administered in treating atherosclerosis are the so-called lipotropic substances, which prevent fat from accumulating in the organism.

Since the nervous system affects the metabolic processes, thе patients are prescribed such drugs as bromide and valerian.

Text D. ***Angina Pectoris***

Angina pectoris is chest pain or discomfort that occurs when your heart muscle does not get enough blood. Angina may feel like pressure or a squeezing pain in your chest. The pain may also occur in your shoulders, arms, neck, jaw, or back. It may also feel like indigestion.

Angina is a symptom of coronary artery disease (CAD), the most common type of heart disease. It occurs when plaque builds up in the coronary arteries. This buildup of plaque is called atherosclerosis. As plaque builds up, the coronary arteries become narrow and stiff. Blood flow to the heart is reduced. This decreases the oxygen supply to the heart muscle.

People have discomfort and pain in the chest and such symptoms as nausea, fatigue, shortness of breath, sweating, light-headedness, or weakness may also occur.

A coronary artery narrowed by an atherosclerotic plaque may allow enough blood to pass through it during rest and or mild activity. If cardiac work should increase then a disproportion between available blood on the one hand and the work of the heart on the other is created and myocardial ischemia is the result. In addition to physical effort, the work of the heart can be increased by eating a meal, by emotional disturbances, and by peripheral vasospasm such as that which occurs on exposure to a cold atmosphere. Obesity also matters because of the greater demand for blood to nourish the extra fat, and of the greater amount of effort necessary to carry this extra weight.

Angina is usually treated with medicines such as nitrates (nitroglycerin), other medicines to lower their blood pressure or cholesterol and to prevent blood clots. To prevent and treat angina, it is important to get regular physical activity, maintain a healthy weight, not to smoke, and eat a healthy diet that is low in saturated fat and cholesterol.

Words:

a squeezing pain - сжимающая боль

indigestion - расстройство желудка, несварение

stiff – тугоподвижный, ригидный, неэластичный

disturbances – нарушения, расстройства, отклонения

exposure to - воздействие на

to prevent blood clots - предотвратить образование тромбов (сгустков крови)

saturated fat - насыщенный жир

greater demand for – более высокая потребность в

**Think of the ways to keep your heart healthy. The figure provided below will help you. What would you advise to a patient who wants to have a healthy heart?**

http://www.slideshare.net/mrdelgado/the-heart-ppt?next\_slideshow=3

**▼ To give advice, you may use the following verbs:**

*Avoid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Don’t \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .*

*Try to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . You should (shouldn’t) \_\_\_\_\_\_\_\_\_\_\_\_\_ .*

**TEST A. Choose the suitable words**

1. A HEART CAN BEAT MORE THAN \_\_\_\_ TIMES A DAY.

1) one hundred thousand

2) a hundred

3) a thousand

4) one thousand

2. A HEART PUMPS\_\_\_\_\_ GALLONS OF BLOOD THROUGH \_\_\_ MILE NETWORK OF VESSELS IN THE BODY.

1) one thousand\_\_\_\_sixty thousand

2) a hundred thousand \_\_\_ sixteen thousand

3) two thousand \_\_\_ sixty thousand

4) a thousand\_\_\_\_ sixty thousand

3. THE VEINS RETURN THE DEOXYGENATED BLOOD TO THE \_\_\_\_

1) left atrium

2) right ventricle

3) left ventricle

4) right atrium

4. THE RIGHT SIDE OF THE HEART RECEIVES BLOOD THAT IS LOW IN \_\_\_\_ FROM THE VEINS ALL OVER THE BODY.

1) carbon dioxide

2) waste materials

3) nutrients

4) oxygen

5. THE HEART HAS \_\_\_ VALVES.

1) four

2) three

3) two

4) five

6. THE OPENING AND CLOSING OF THE LEAFLETS IS CONTROLLED BY \_\_\_ .

1) oxygen

2) electrical impulses

3) blood pressure

4) carbon dioxide

7. SMALL ARTERIES PROVIDING BLOOD DIRECTLY TO THE HEART ARE CALLED \_\_\_.

1) capillaries

2) veins

3) coronary arteries

4) atrium

8. CORONARY ARTERY DISEASE CAUSES A \_\_\_IN BLOOD FLOW TO THE HEART MUSCLE.

 1) increase

 2) decrease

 3) extension

 4) dilation

9. THE BEATING OF THE HEART IS REGULATED BY \_\_\_.

1) blood pressure

2) electrical impulses

3) carbon dioxide

4) oxygen

10. THE ELECTRICAL IMPULSES ARE GENERATED BY YOUR \_\_.

1) heart muscle

2) coronary arteries

3) carbon dioxide

4) blood pressure

**TEST** B**. Choose the appropriate words:**

1. \_\_\_ARE THE LARGEST BLOOD VESSELS IN THE CIRCULATORY SYSTEM .

1) veins

2) capillaries

3) arterioles

4) arteries

1. THE EXCHANGE GASES NUTRIENTS AND WAISTS TAKES PLACE IN THE \_\_ .
2. arteries
3. veins
4. capillaries
5. venules
6. AT ANY GIVEN MOMENT ABOUT 65% OF THE BLOOD IS CIRCULATING IN THE \_\_ .
7. arteries
8. veins
9. capillaries
10. venules
11. THE OUTER ARTERY LAYER IS MADE OF \_\_ TISSUE.
12. contractive
13. connective
14. cerebral
15. osteal
16. THE MIDDLE LAYER OF THE VESSELES CONSISTS OF \_\_ MUSCLES.
17. skeletal
18. antagonistic
19. dilator
20. smooth

6. AT ANY GIVEN MOMENT ABOUT 35% OF THE BLOOD IS

 CIRCULATING IN THE \_\_ .

1. arteries
2. veins
3. capillaries
4. venules
5. AT ANY GIVEN MOMENT ABOUT 5% OF THE BLOOD IS CIRCULATING IN THE \_\_ .
6. arteries
7. veins
8. capillaries
9. venules
10. . \_\_ ARE THE SMALLEST BLOOD VESSELS IN THE CIRCULATORY SYSTEM.
11. arteries
12. veins
13. capillaries
14. venules

9. SKELETAL MUSCULES HELP THE BLOOD KEEP MOVING BY \_\_ .

1. dilating
2. contracting
3. relaxing
4. coarcting

10. THE MIDDLE LAYER OF THE ARTERIES CONSISTS OF \_\_ MUSCLES.

1) compressor

2) dilator

3) skeletal

4) smooth