CONTROL AND MEASURING DEVICES

Questions of the program for midterm control 1

Name of the discipline: "Cardiovascular system in normal"

Discipline code: CSN 2211

EP name and code: 6B10115 – «Medicine»

Amount of study hours/credits: 30/1,0

Course and semester of study: 2/4

Compiled by: senior lecturer Toymbetova K.A.
Translated by: senior lecturer Sartaeva U.S.

1. What causes blood vessels to develop and under the influence of what factors?

2. How are the arteries classified?

3. General plan of the structure and blood supply of the artery wall 4.What is included in the concept of "microcirculatory vessels"?

5. List the types of capillaries and name the organs in which they occur.

6. What is the principle of interaction between hemodynamic conditions and vascular structure?

7. The membranes of the heart and their tissue composition.

8. Structural and functional units of striated cardiac muscle tissue and the forms of their connection with each other.

9. Functional significance and features of typical and atypical myocardial muscle tissue.

10. Age-related structural features of the heart.

11.Endocrine function of atrial cardiomyocytes

12. Features of the cardiac conduction system

13. Sinoatrial node.

14. Atrioventricular node.

15. Hiss bundles.

16. Purkinje cells.

Head of the Department _____ Murzanova D.A.
Protocol No. 11 Date 26.06.2025

Questions of the program for midterm control 2

Compiled by: _____ senior lecturer Toymbetova K.A.
Translated by: _____ senior lecturer Sartaeva U.S.

1. How are veins classified?
2. The structure of the membranes of the vein wall
3. Features in childhood.
4. Morphofunctional characteristics of vessels of the microcirculatory bed.
5. Sources of development
6. Arteriol-venular anastomoses
7. What is the structure of lymphatic capillaries?
8. What are the differences between lymphatic vessels and veins in terms of histological structure?
9. What are the layers of the wall of medium-sized lymphatic vessels?
10. What are lymphatic valves and how do they work?
11. What is the difference between the structure of lymphatic vessels and lymphatic capillaries?
12. What are the functions of lymphatic vessels?
13. What is the histological structure of the thoracic lymph duct?

Head of the Department _____ Murzanova D.A.
Protocol No. 11 Date 26.06.2025

CONTROL AND MEASURING DEVICES

Questions of the program for intermediate certification

Name of the discipline: "Cardiovascular system in normal"

Discipline code: CSN 2211

EP name and code: 6B10115 – «Medicine»

Amount of study hours/credits: 30/1,0

Course and semester of study: 2/4

Compiled by: senior lecturer Toymbetova K.A.
Translated by: senior lecturer Sartaeva U.S.

<question>In the histological laboratory, the student studied the structure of blood vessels under a microscope. What epithelium is lined with the inner lining of a blood vessel?
<variant>endothelium
<variant>transitional
<variant>single-layer prismatic
<variant>single-layer cubic
<variant> mesothelium
<question> During an ultrasound examination of the heart, the presence of an endocardium was detected. What functions does this fabric perform?
<variant> Providing smoothness to reduce friction
<variant> Maintaining the shape of the heart
<variant> Conducting electrical impulses
<variant> Blood filtration
<variant> Ensuring the elasticity of the heart valves
<question>The athlete developed functional hypertrophy of the left ventricle of the heart as a result of constant physical exertion. What is the morphofunctional process underlying it?
<variant>An increase in cell size and the number of myofibrils
<variant>An increase in the number of fibroblasts
<variant>Increase in the number of conductive cardiomyocytes
<variant>An increase in the amount of connective tissue
<variant>An increase in the amount of adipose tissue
<question>In a patient with pericarditis, serous fluid accumulates in the pericardial cavity. Which pericardial cells are affected by this process?
<variant>Mesothelial cells
<variant>of Endothelial cells
<variant>Smooth myocytes
<variant>Fibroblasts
<variant>Macrophages

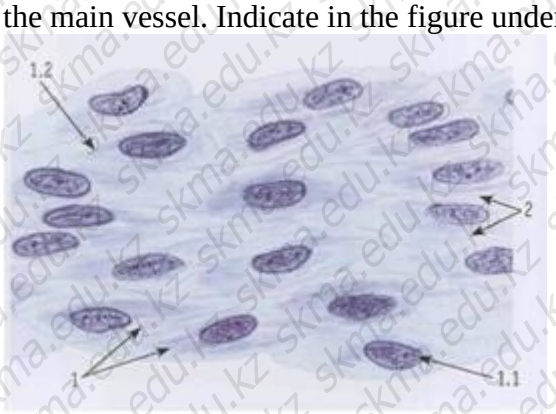
.<question>A patient with a tangential gunshot wound to the pericardium was admitted to the clinic. Which epithelium is damaged as a result of injury?
<variant>Single-layer flat
<variant>Single-layer cubic
<variant>Single-layer prismatic
<variant>Multilayer flat keratinizing
<variant>Multi-layered flat non-corneating
<question>Histological examination of the vessel wall, which was removed during the operation, revealed a more developed middle shell, formed by smooth muscle tissue separated by elastic membranes. What kind of vessel is it?
<variant>Elastic type artery
<variant>Muscle type vein
<variant>Mixed type artery
<variant>Muscle type artery
<variant>Capillary
<question> The patient has signs of autoimmune organ damage, which may be a consequence of a violation of the structure and function of the hematothymus barrier. What structures are involved in its formation?
<variant>Endotheliocytes and the basement membrane of capillaries
<variant>Dendritic macrophages and the basement membrane of capillaries
<variant>Ghassal's corpuscles and the basal membrane of capillaries
<variant>Postcapillary venules of the medulla
<variant>Connective tissue trabeculae
<question> During the experiment, it was found out that the regeneration of myocardial cells occurs due to …
<variant>intracellular regeneration of cardiomyocytes
<variant>intracellular regeneration of stem cells
<variant>intracellular regeneration of myoblasts
<variant>intracellular regeneration of myosatellite cells
<variant>mitosis of cardiomyocytes
<question>After myocardial infarction, the following fibroblasts are involved in its regeneration:
<variant>
<variant>adipocytes
<variant>cardiomyocytes
<variant>labrocytes
<variant>fibrocytes
<question>The subendothelial layer of the artery and vein consists of... tissue.
<variant>loose fibrous connective tissue
<variant>dense connective tissue
<variant>epithelial
<variant>reticular
<variant>fat
<question>The walls of the vessels have significant morphological differences in the structure of the middle shell. What is the reason for the appearance of specific structural features of this shell in different vessels?
<variant>Hemodynamic conditions
<variant>The influence of the organs of the endocrine system

<variant>Regulation by the central nervous system
<variant>The inductive effect of neurons of the autonomic ganglia
<variant>High content of catecholamines in the blood
<question>The inner shell of a blood vessel is formed by:
<variant>endothelium, subendothelial layer, inner elastic membrane;
<variant>endothelium, internal connective tissue, musculoelastic and external connective tissue layers;
<variant>with a single-layer ciliated epithelium, its own plate, muscular plate, submucosal base;
<variant>mesothelium, a loose fibrous connective tissue;
<variant>a single-layer edged epithelium, its own plate.
.<question>The middle membrane of the blood vessel is formed by ...
<variant>mesenchymal type muscle tissue, loose fibrous
connective tissue;
<variant>muscle tissue of the coelomic type, loose fibrous connective tissue;
<variant>endothelium, loose fibrous connective tissue;
<variant>mesothelium, a loose fibrous connective tissue;
<variant>somatic type muscle tissue, loose fibrous connective tissue.
<question>The outer shell of the blood vessel is formed...
<variant>external elastic membrane, loose fibrous connective tissue;
<variant>mesenchymal
type muscle tissue, loose fibrous connective tissue;
<variant>reticular tissue, elastic membranes;
<variant>mesothelium, a loose fibrous connective tissue;
<variant>dense fibrous connective tissue.
<question>The most characteristic morphological features of the endothelium:
<variant> flat shape, a large number of transport bubbles and transepithelial channels in the cytoplasm;
<variant>prismatic shape, brush border;
<variant>cubic shape, well-developed synthetic apparatus;
<variant>cubic shape, well-developed smooth EPS;
<variant>multi-faceted shape, a large number of glycogen and lipid inclusions in the cytoplasm.
<question>The most characteristic morphological features of the aorta:
<variant>relatively thick intima, a large number of elastic fibers in all shells, elastic terminal membranes in the middle shell;
<variant>thick intima, a large amount of striated muscle tissue in the middle shell;
<variant>thin intimacy, 1-2 layers of smooth muscle cells in the middle shell.
<variant>thin intimacy, a large amount of smooth muscle tissue in the middle shell;
<variant>thin intimacy, a large amount of loose fibrous connective tissue in the middle shell.
<question>The most characteristic morphological features of a muscular type artery:
<variant>Thick middle shell, developed outer and inner elastic membranes, predominance of smooth muscle tissue;
<variant>Thick intima, a large amount of striated muscle tissue in the middle shell;
<variant>Thin intimacy, a large amount of loose fibrous connective tissue in the middle shell.
<variant>Thin intimacy, 1-2 layers of smooth muscle cells in the middle shell;
<variant>A relatively thick intima, a large number of elastic fibers in all shells, elastic terminal membranes in the middle shell.

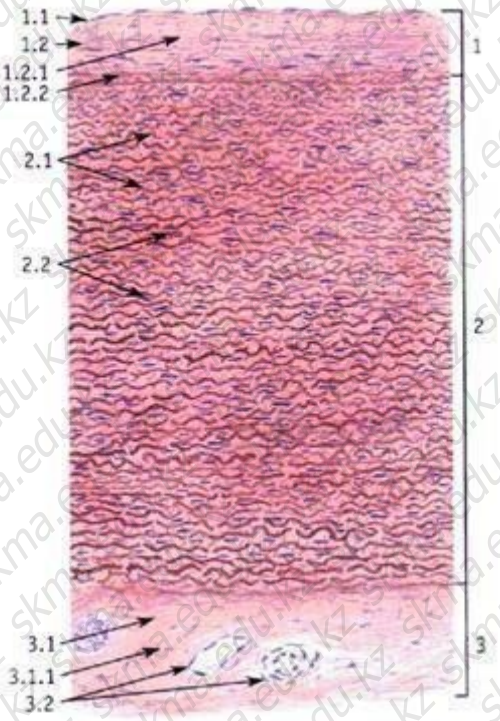
<question>Large-caliber arteries during systole stretch and return to their original state during diastole, ensuring stable blood flow. What elements of the vessel wall can explain this?
<variant>Elastic fibers
<variant>Muscle fibers
<variant>of Reticular fibers
<variant>of Collagen fibers
<variant>A large number of fibroblasts
<question>During morphological examination, an irregularly shaped vessel is determined in the histopreparation, the middle shell of which is formed by bundles of smooth myocytes and layers of connective tissue. What kind of vessel is this?
<variant>Muscle type vein
<variant>Muscle type artery
<variant>Lymphatic vessel
<variant>Venula
<variant>Arteriole
<question>There are several membranes in the wall of blood vessels and the wall of the heart. Which of the membranes of the heart is similar in histogenesis and tissue composition to the vascular wall?
<variant>Endocardium
<variant>Myocardium
<variant>Pericardium
<variant>Epicard
<variant>Endothelium
<question>During emotional arousal, the human heart rate reached 112 per minute. Which department of the cardiac conduction system is responsible for this change?
<variant>Sinoatrial node
<variant>A bundle of Gis
<variant>The legs of the Gis bundle
<variant>Purkinje Fibers
<variant>Atrioventricular node
<question>The non-muscular type of veins includes:
<variant>bone veins
<variant>superior vena cava
<variant>femoral vein
<variant>brachial vein
<variant>inferior vena cava
<question>The electrical connection between cardiomyocytes is provided by:
<variant>nexuses
<variant>desmosomes
<variant>complex connections
<variant>synapse
<variant>simple connection
<question>The structural and functional unit of cardiac muscle tissue is …
<variant>fiber
<variant>cardiomyocyte
<variant>syncytium
<variant>simplast

<variant>intercellular substance
<question>Regeneration of myocardial cells occurs due to …
<variant>intracellular regeneration of cardiomyocytes
<variant>intracellular regeneration of stem cells
<variant>intracellular regeneration of myoblasts
<variant>intracellular regeneration of myosatellite cells
<variant>mitosis of cardiomyocytes
<question> You have been provided with a histological preparation for examination. On microscopic examination, you notice the presence of striated muscle fibers and insertion discs. Determine which histological preparation is presented?
<variant> Myocardium
<variant> Endocardium
<variant> Pericardium
<variant> Sarcomere
<variant> Myosimplast
<question>The most characteristic morphological features of the vein:
<variant>Relatively thin wall, indistinct differentiation of shells, predominance of adventitious shell in thickness, presence of valves, longitudinal orientation of a part of smooth muscle cells;
<variant>Relatively thick wall, clear differentiation of membranes, predominance of the thickness of the muscle membrane,
circular orientation of smooth muscle cells;
<variant>Thick wall, the presence of elastic terminal membranes of elastic fibers, smooth muscle and
connective tissue cells;
<variant>Thick wall, presence of striated muscle tissue of somatic type and loose fibrous connective tissue;
<variant>Thin wall, presence of pericytes and adventitious cells in the wall.
<question>In the vein wall with an average development of muscle elements, they are oriented...
<variant>Longitudinally in intima and adventitia, circularly in the middle shell;
<variant>Longitudinally in the outer shell, circularly in the intima and middle shell;
<variant>Longitudinally in the intima, circularly in the middle shell and adventitia;
<variant>Circularly in the intima, longitudinally in the adventitia and the middle shell;
<variant>Circularly in intima and adventitia, longitudinally in the middle shell.
<question>The wall of the lymphatic capillary is formed by...
<variant>Endothelium with an intermittent basement membrane;
<variant>Endothelium with an intermittent elastic membrane;
<variant>Endothelium with a solid basement membrane;
<variant>Mesothelium with an intermittent basement membrane;
<variant>Reticulocytes with an intermittent basement membrane.
<question>Reparative regeneration of a blood vessel is ensured by proliferation:
<variant>Endotheliocytes, fibroblasts, smooth muscle cells;
<variant>Endotheliocytes, histiocytes, smooth muscle cells;
<variant>Endotheliocytes, fibroblasts, histiocytes;
<variant>Mesotheliocytes, fibroblasts;
<variant>Fibroblasts, reticulocytes, smooth muscle cells.
question>The wall of sinusoidal hemocapillaries includes:
<variant>Endothelial cells, stellate macrophages, perisinusoidal lipocytes, pit cells;

<variant>Epithelial, goblet-shaped and endocrine cells;
<variant>Main, parietal and cervical cells;
<variant>Acinocytes, centroacinous cells;
<variant>Serocytes, mucocytes, myoepitheliocytes.
<question> What tissues form the artery wall?
<variant>epithelial, smooth muscle, loose connective tissue
<variant>epithelial, striated muscle tissue, loose connective tissue
<variant>epithelial, smooth muscle tissue, dense shaped connective tissue
<variant>epithelial, smooth muscle tissue
<variant>epithelial, smooth muscle tissue, reticular
<question>If there are terminal elastic membranes in the middle shell of the vessel, then this is:
<variant>elastic type artery
<variant>venula
<variant>mixed type artery
<variant>muscle type artery
<variant>arteriole
<question>The inner surface of the blood vessels is covered with epithelium, which synthesizes substances that interfere with the process of blood clotting in the vessels. What kind of epithelium is it?
<variant>Single-layer flat (endothelium)
<variant>Multi-layered flat non-corneating
<variant>Multilayer flat keratinizing
<variant>Single-layer flat (mesothelium)
<variant>Single-layer multi-row prismatic
<question>The histological preparation stained with iron hematoxylin shows the endothelium of the main vessel. Indicate in the figure under which number the endotheliocytes are indicated?



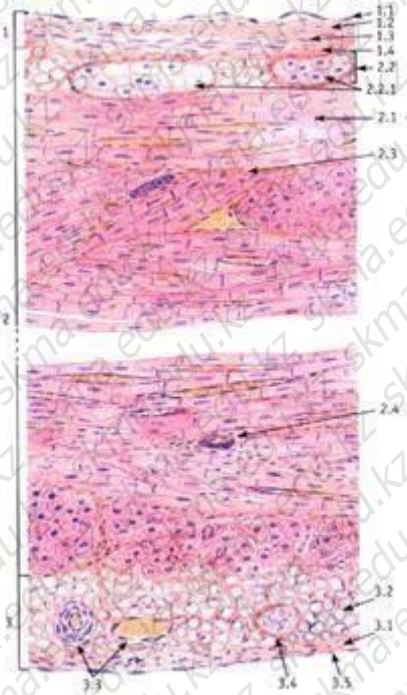
<variant>1
<variant>1.1
<variant>1.2
<variant>2
<variant>1.1 and 1.2
<question>Indicate in the figure under which number the structure defining elastic fibers on the micropreparation is indicated:



<variant>1.2.1
<variant>2.1
<variant>1.2
<variant>2
<variant>3.1
<question>Which of the structural features is characteristic of arteries?
<variant>strong development of the inner elastic membrane
<variant>weak development of the circular muscle layer, more frequent longitudinal arrangement of smooth myocytes
<variant>strong adventitia development and weaker inner and middle shells
<variant>availability of valves
<variant>lower thickness compared to the vein wall
<question>In large lymphatic vessels, smooth myocytes are located:
<variant>in all shells
<variant>in the middle shell
<variant>in the outer shell
<variant>in the inner shell
<variant>missing
<question>Identify the vein identified on the histological preparation, which, in the absence of blood in it, has a gaping lumen, very thin walls and the absence of a middle shell.
<variant>Splenic vein
<variant>Superior vena cava
<variant>Inferior vena cava
<variant>Femoral vein
<variant>The brachial vein

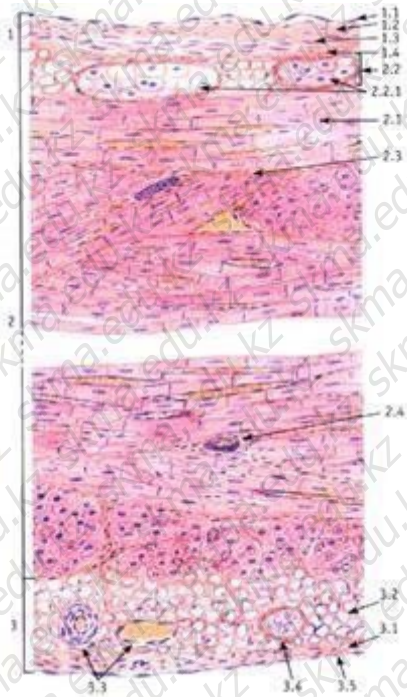
<question>Myocardiodystrophy is accompanied by a violation of the metabolism of cardiomyocytes. What kind of developmental disorder is this pathology associated with?
<variant>Myoepicardial plate
<variant>Mesenchymal plate
<variant>Myotoma
<variant>Enterodermal plate
<variant>Ectodermal plate
<question>What is the number of smooth myocytes in the picture?

<variant>2.1
<variant>3
<variant>1.2
<variant>2
<variant>3.1
<question>The heart wall is represented in the micropreparation. What is the number of the adipose tissue in the figure?

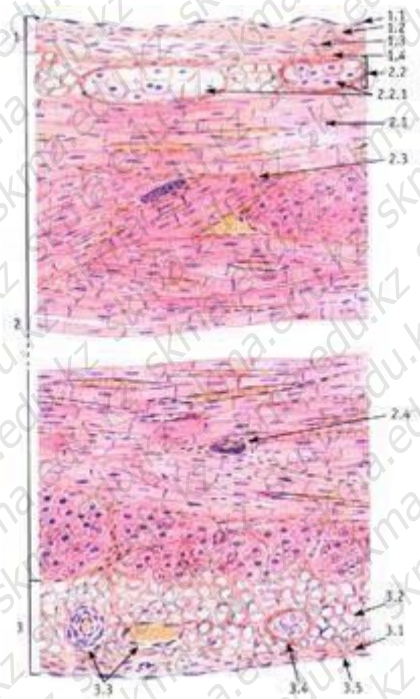


<variant>3.2

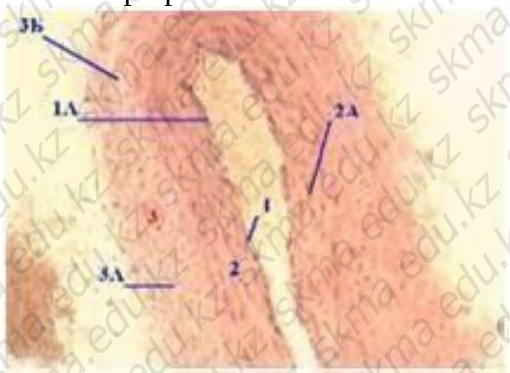
<variant>3
<variant>1.2
<variant>2
<variant>3.1
<question> Determine in the figure under which number the structure responsible for the contractile function of the heart is indicated:



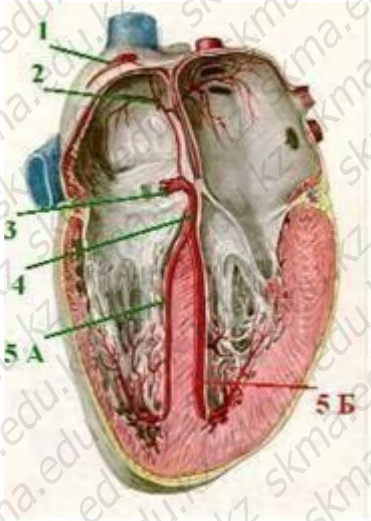
<variant>2.1
<variant>2.2
<variant>2.2.1
<variant>2.3
<variant>3.1
<question> Determine in the figure under which number the structure responsible for the conductive function of the heart is indicated:



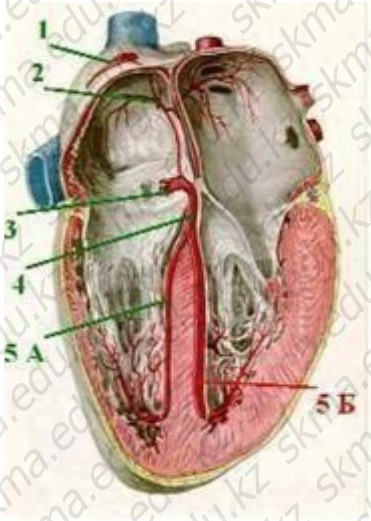
<variant>2.2.1
<variant>2.2
<variant>2.1
<variant>2.3
<variant>3.1
question>Indicate in the figure under which number the structure defining the femoral vein on the micropreparation is indicated:



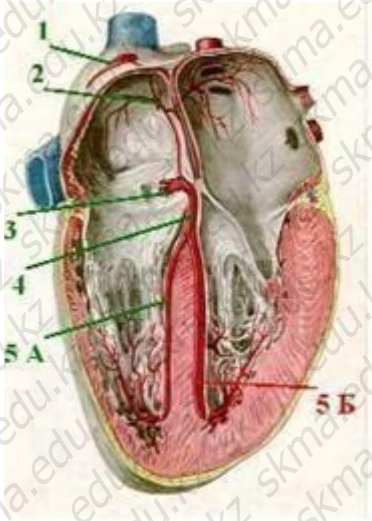
<variant>3B
<variant>3A
<variant>2A
<variant>1A
<variant>1
<question> Indicate in the figure under which number the structure is indicated, which is the driver of the heart rhythm:



<variant>1
<variant>2
<variant>3
<variant>4
<variant>5A
<question> Indicate in the figure under which number the structure is indicated, the basis of which is transitional cardiomyocytes:

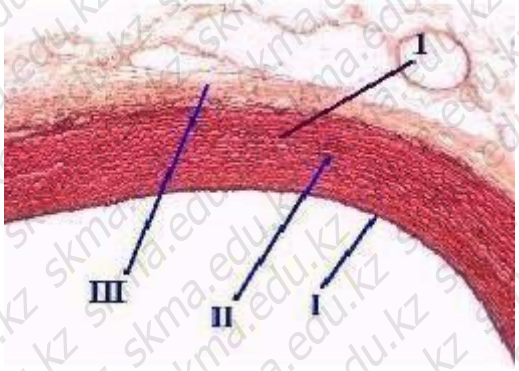


<variant>3
<variant>2
<variant>1
<variant>4
<variant>5B
<question> Indicate in the figure under which number the structure is indicated, the basis of which is pacemaker cardiomyocytes:



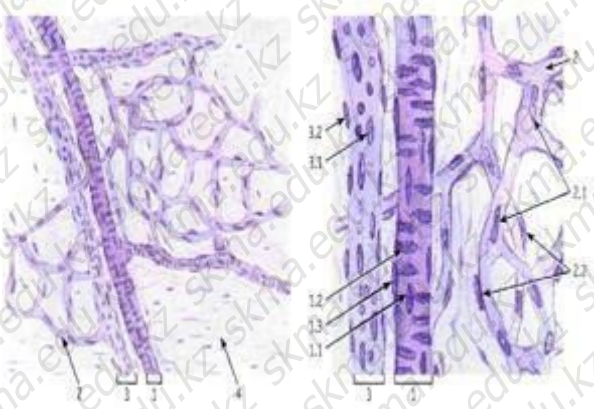
<variant>1
<variant>2
<variant>3
<variant>4
<variant>5A
<question> When examining the artery sample, a high concentration of smooth muscle cells was found in the middle membrane. What functions can these cells perform in the artery?
<variant>Regulation of artery diameter
<variant>Synthesis of collagen and elastin
<variant>Participation in the regulation of blood pressure.
<variant> Secretion of vasodilating substances.
<variant> Providing nutrition to arterial wall cells
<question> Under the microscope, the researcher noticed a large number of elastic fibers in the artery wall. What is the role of elastic fibers in the arterial wall?
<variant> Maintaining the elasticity of the arterial wall
<variant> Participation in blood pressure regulation
<variant> Filtration of toxins from the blood
<variant> Red blood cell production
<variant> Participation in the regulation of body temperature
<question> Under the microscope, endothelial cells lining the inner surface of the arterial wall were found. What functions does the endothelium perform?
<variant> Regulation of arterial wall permeability
<variant> Hormone production
<variant> Formation of new blood vessels
<variant> Participation in the blood clotting process
<variant> Participation in the regulation of the immune response
<question> During the laboratory work, you discovered a vein with characteristic features. Which of the listed structures are typical for veins normally?
<variant> The presence of an annular layer of smooth muscles
<variant> High level of wall elasticity
<variant> Absence of endothelium
<variant> No valves
<variant>The presence of lymph nodes in the vein wall

<question>During the study, you noticed that the patient has swelling. What features of the structure of veins can be associated with the appearance of edema?
<variant>Decrease in the volume of the lumen of the vein
<variant> Thickening of the endothelium
<variant> Smooth muscle degeneration
<variant> Increased valve function
<variant> The presence of a large number of lymph nodes
<question> On microscopic examination, you notice that the wall of a lymphatic vessel consists of three layers: the endothelium, the basement membrane and one layer of smooth muscle cells. What type of lymphatic vessel are you examining?
<variant> Lymphatic collector
<variant> Lymphatic capillary
<variant> Precapillary vessel
<variant> Lymphatic trunk
<variant> Lymph node
<question> When examining a lymphatic vessel, you see that it has valves. What function do these valves perform?
<variant> Provide passage of lymph in only one direction
<variant>They prevent the reverse flow of lymph
<variant> Provide passage of lymph in both directions
<variant> Reduce the permeability of the vascular wall
<variant> They participate in lymph filtration
<question>The capillary electronogram clearly identifies the fenestrae in the endothelium and the pores in the basement membrane. Determine the type of capillary.
<variant>Sinusoidal
<variant>Somatic
<variant>Visceral
<variant>Atypical
<variant>Shunt
<question>On a histological preparation stained with orsein, 40 to 60 terminal elastic membranes were found in the middle shell of the vessel. Identify this vessel.



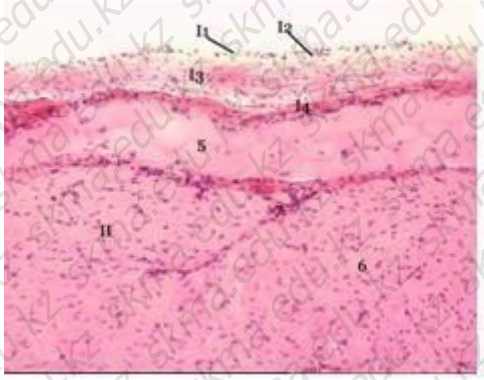
<variant>Elastic type artery
<variant>Muscle type artery
<variant>Mixed type artery
<variant>Muscle type vein
<variant>A muscle-free vein

<question>Indicate in the figure under which number the structure defining the arteriole on the micropreparation is indicated:



<variant>1.2
<variant>1.1
<variant>1.3
<variant>2.1
<variant>2.2
<question>Indicate in the figure under which number the structure defining the hemocapillary on the micropreparation is indicated:

<variant>2.2
<variant>2.1
<variant>2
<variant>3.1
<variant>3.2
<question>Which cells in the figure are located in structures numbered 2,4, 5A,5B?



<variant>Purkinje cells
<variant>Pacemaker
<variant>transients
<variant>secretory
<variant>workers
<question> During the laboratory work, you discovered that the heart tissue consists of working cardiomyocytes. What functions of these cells can you observe?
<variant> Contractile activity
<variant> Collagen production
<variant> Conducting pulses
<variant> Phagocytosis
<variant> Hormone synthesis
<question> During an ultrasound examination of the heart, the presence of an endocardium was detected. What functions does this fabric perform?
<variant> Providing smoothness to reduce friction
<variant> Maintaining the shape of the heart
<variant> Conducting electrical impulses
<variant> Blood filtration
<variant> Ensuring the elasticity of the heart valves

Head of the Department _____ Murzanova D.A.
Protocol No. 11 Date 26.06.2025

CONTROL AND MEASURING DEVICES

1 (2) technical specifications and test tasks for intermediate control or intermediate certification

Name of the discipline: "Normal cardiorespiratory system"

Discipline code: CSN 2211

EP name and code: 6B10115 – «Medicine»

Amount of study hours/credits: 30/1,0

Course and semester of study: 2/4

Compiled by: senior lecturer Toymbetova K.A.
Translated by: senior lecturer Sartaeva U.S.

1. What causes blood vessels to develop and under the influence of what factors?

2. How are the arteries classified?

3. General plan of the structure and blood supply of the artery wall 4.What is included in the concept of "microcirculatory vessels"?

5. List the types of capillaries and name the organs in which they occur.

6. What is the principle of interaction between hemodynamic conditions and vascular structure?

7. The membranes of the heart and their tissue composition.

8. Structural and functional units of striated cardiac muscle tissue and the forms of their connection with each other.

9. Functional significance and features of typical and atypical myocardial muscle tissue.

10. Age-related structural features of the heart.

11.Endocrine function of atrial cardiomyocytes

12. Features of the cardiac conduction system

13. Sinoatrial node.

14. Atrioventricular node.

15. Hiss bundles.

16. Purkinje cells.

17. How are veins classified?
18. The structure of the membranes of the vein wall
19. Features in childhood.
20. Morphofunctional characteristics of vessels of the microcirculatory bed.
21. Sources of development
22. Arteriol-venular anastomoses
23. What is the structure of lymphatic capillaries?
24. What are the differences between lymphatic vessels and veins in terms of histological structure?
25. What are the layers of the wall of medium-sized lymphatic vessels?
26. What are lymphatic valves and how do they work?
27. What is the difference between the structure of lymphatic vessels and lymphatic capillaries?
28. What are the functions of lymphatic vessels?
29. What is the histological structure of the thoracic lymph duct?

Head of the Department _____ Murzanova D.A.

Protocol No. 11 Date 26.06.2025

CONTROL AND MEASURING DEVICES

List of practical skills in the discipline

Name of the discipline: "Normal cardiorespiratory system"

Discipline code: CSN 2211

EP name and code: 6B10115 – «Medicine»

Amount of study hours/credits: 30/1,0

Course and semester of study: 2/4

Compiled by: senior lecturer Toymbetova K.A.
Translated by: senior lecturer Sartaeva U.S.

List of permanent histological micropreparations

1. Determine the type of arteries.
2. Determine the type of vessels.
3. Describe the histopreparation of the heart valve.
4. Describe the histopreparation of the vessel.
5. Describe the histopreparation of the aorta.
6. Describe the histopreparation of the myocardium.
7. Determine the type of veins in the lower extremities.
8. Describe the structure of the artery muscular type.
9. Describe the electronogram of the blood capillaries.
10. Determine the type of veins

Head of the Department _____ Murzanova D.A.
Protocol No. 11 Date 26.06.2025