GUIDELINES FOR PRACTICAL TRAINING

Discipline: "Normal cardiorespiratory system"

Discipline code : NCS 2207

Name and code of the EP: 6B10115 "Medicine"

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

Course and semester of study: 2/4

The amount of practical training: 8 hours

Shymkent, 2024

The guidelines for practical training have been developed in accordance with the working curriculum of the discipline (syllabus) "Normal cardiorespiratory system" and approved at the meeting of the Department of "Topographic anatomy and histology"

Protocol No. 1 from "03" 09 2024

Head of the department,c.m.s., acting professor _____ Murzanova D.A.

Lesson No. 1

1. Topic: Arteries.

2. Purpose:

• * To know the microscopic and ultramicroscopic structure of the wall of the artery and organ specificity

3. Learning objectives :

• Learn to identify the drugs of the heart and muscle type
• To identify the characteristics of the plastic type
• To understand the specifics of the structure of the arteria of the musculoskeletal type
• Understand the age-related changes in the walls of the arteries
• There are representations of organospecificityarteria

4.Basic questions:

Complete tasks

1. Write down the table of the fabric and the composition of the various types of the card

Type of arteries	Оболочки		
	internal	average	outdoor

Handout material

1.The microscope
2.Histological micro-preparations for the study of the examination:
1. The aorta.Staining with hematoxylin-eosin
2. Muscle-type artery.Staining with hematoxylin-eosin

5. The main forms / methods / technologies of learning to achieve the LO discipline: work in small groups, checklist of histopreparations, microphotographs

6. Types of control to assess the level of achievement of the LO discipline: a checklist for evaluating a practical lesson.

7. Literature.

Main literature

1. Inderbir Singh. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2016.-302 p.ПереводГистологиячеловека
2. Dudek Ronald W. Embryology / Ronald W. Dudek. - 5th ed. - [s. l.] : Wolters Kluwer, 2014. - 158 p. Перевод заглавия: Эмбриология
3. Gartner Leslie P. Cell Biology and Histology / Leslie P. Gartner. - 8th ed. - [s. l.] :Wolters Kluwer, 2019. - 436 p. - (BRS. Board Review Series)Переводзаглавия: Клеточнаябиологияигистология

Additional literature

Textbook of Human Histology.Inderbir Singh /Sixth Edition/Inderbir Singh 2010.-386 p.
Перевод Учебник по гистологии человека

Electronic publications

1. ATLAS OF HISTOLOGY with Functional Correlations. Thirteenth Edition, Wolters Kluwer.2017.- 1102 p.
2. Theory and practice of Histological techniques.Eighth edition.Elsevier Limited.2019.-554 p.

3. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2011.-386 p.
4. USMLE Step 1.Lecture Notes 2018.by Kaplan.2018.-425 p/
5. Zhumabayeva, S.E., Boken, T.S. Cytology and histology : Educational-methodical complex. . - Kokshetau: KGU, 2017. - 101 p.http://rmebrk.kz/
6. Бородулина, О.В.Цитология и гистология – Cytology and histology : Практикум. / Костанайский гос. педагогический университет им. У. Султангазина. - Костанай: КГПУ им.У.Султангазина, 2020. - 100 с. - http://rmebrk.kz/

8. Control

Questions

1. What do vessels develop from and under the influence of what factors?
2. How are arteries classified?
3. General plan of the structure and blood supply of the artery wall
4. What is the principle of the interaction of the dynamic conditions of the structure of the vessels

Tests

1.Endothelial cells:
A. have an
elongated, flattened shape,poor in organelles B. connect to the basal membrane with the help of chromosomes
C. cover the vessels externally
D. have a circular shape
E. have many organelles
2.Adventitious cells:
A. have a circular shape
B. meet in the middle layers of capillaries
C. have pericytes
D. highly
specialized E. cells are cambial polypotent
3.Shells found in vessels(uncountable capillaries):
A. tunicamucosa,tunica media,tunicaadventicia
B. tunicaserosa,tunicamedia,tunicaadventicia
C. tunicaintima,tunicamedia,tunicaadventicia
D. tunicamucosa,tunicamedia,tunicaserosa
E. tunicamucosa,tunicasubmucosa,tunicaadventicia
4. Carteriaelastic type refers to:
A. aorta
B. hepaticarteria
C. Liver circle
D. femoral arteria
E. radiation arteria
5.Carteriaelastic type refers to:
A. renal arteria
B. ulnar arteria
C. pulmonary arteria

D. Vilisievkrug
E. upper thyroid artery
6.Primary blood vessels develop in:
A. mesodermeamnion
B. endodermeamnion
C. mesodermeamnion
D. mesodermeamnion
E. mesodermeallantois
7.Fenestrated capillaries:
A. occur
in endocrine glands B. Fenesters are
specialized
subcellular compounds between endothelial cells C. Occur in light
D. Basal membranes have pores
E. Fenesters reduce permeability and weaken the transport of substances
8.Capillaries:
A. They are constantly forming in the body
B. They are composed of
C. Sinusoidal
capillaries have a continuous basal membrane D. sinusoidal capillaries are found in the organs of hematopoiesis
E. Regulate arterial pressure
9.Capillaries:
A. Transport
blood to organs B. Somatic
capillaries meet the liver C. The wall is made of three shells
D. The walls are made of elastic fibers and
E. provide gas exchange of materials
10.Collective veins:
A. the
walls of the walls of three shells B. begin with venous capillaries
C. fall into veins
D. have only inner and middle shells

Tasks

1. On the preparation stained with hematoxylin-eosin, vessels with a diameter of about 2mm are visible.The water is well expressed by the boundaries between the shells, the inner and outer elastic membranes. The middle shell contains a large number of circularly arranged bundles of smooth muscle cells.Other vascular elastic membranes are not expressed. Due to the weak development of muscle bundles, the wall thickness is smaller, the lumen has fallen off, and the shape is irregular.Identify these vessels.
2. Demonstrate two drugs of the arterium. Водном нограницевнутреннейисреднейоболочекартериихорошовыраженавнутренняяэластическая мембрана,вдругом– There is no elastic membrane, but there are many elastic elements (membranes) in the middle shell.What is the reason why you can belong to the army in your second drugs?
3.There are two preparations of vessels stained with horsein.Vodnomiznih are good-looking

The inner outer elastic membranes, as well as elastic fibers in all three shells; in the other, in the middle shell there are a large number of thick elastic membranes, as well as elastic fibers in all three shells. Identify these vessels.

4. An artery with a diameter of about 2 mm is visible on the preparation stained with hematoxylin-eosin. There are no well-expressed borders between the shells, the inner and outer elastic membranes.The middle layer contains a large number of smooth muscle cells and elastic fibers. What type does this artery belong to?

5. The student, talking about the structure of blood vessels, noted that from the side of the enlightenment, the skin is lined with a single layer of epithelium, which is called the endothelium.Right or wrong, what is it?

Lesson No. 2

1.Topic:Vessels of the microcirculatory bed

2. Purpose:

• * To know the microscopic and ultramicroscopic structure of the vessels of the microcirculatory bed

3. Learning objectives:

• Learn to identify the vessels of the microcirculatory bed at the microscopic level

• To understand the morphofunctional features of capillaries

4.Basic questions:

Complete the tasks

1.Fill in the tablycellular elements with the composition of arterioles,capillaries, veins,and the main functions of these vessels.

ICR Vessels	Cellular composition	Functions
Arterioles		
Capillaries		
Venules		

2.Fill in the table of the main types of capillaries, indicating which organs they are characteristic of and their functional significance

Types of capillaries	Organs	Functions

Handout material

1.The microscope

2.Histological micro-preparations:

1.Arteriole, venule capillary Iron hemotoxylin staining. 130 figure

5. The main forms / methods / technologies of learning to achieve the LO discipline: work in small groups, checklist of histopreparations, microphotographs

6. Types of control to assess the level of achievement of the LO discipline: a checklist for evaluating a practical lesson.

7. Literature.

Main literature

1. Inderbir Singh. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2016.-302 p.ПереводГистологиячеловека

2. Dudek Ronald W. Embryology / Ronald W. Dudek. - 5th ed. - [s. l.] : Wolters Kluwer, 2014. - 158 p. Перевод заглавия: Эмбриология

3. Gartner Leslie P. Cell Biology and Histology / Leslie P. Gartner. - 8th ed. - [s. l.] :Wolters Kluwer, 2019. - 436 p. - (BRS. Board Review Series)Переводзаглавия: Клеточнаябиологияигистология

Additional literature

Textbook of Human Histology.Inderbir Singh /Sixth Edition/Inderbir Singh 2010.-386 p. Перевод Учебник по гистологии человека

Electronic publications

1. ATLAS OF HISTOLOGY with Functional Correlations. Thirteenth Edition, Wolters Kluwer.2017.- 1102 p.

2. Theory and practice of Histological techniques.Eighth edition.Elsevier Limited.2019.-554 p.

3. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2011.-386 p.

4. USMLE Step 1.Lecture Notes 2018.by Kaplan.2018.-425 p/

5. Zhumabayeva, S.E., Boken, T.S. Cytology and histology : Educational-methodical complex. . - Kokshetau: KGU, 2017. - 101 p.http://rmebrk.kz/

6. Бородулина, О.В.Цитология и гистология – Cytology and histology : Практикум. / Костанайский гос. педагогический университет им. У. Султангазина. - Костанай: КГПУ им.У.Султангазина, 2020. - 100 с. - http://rmebrk.kz/

8. Control questions

1 What is the meaning of the "vascular microcirculatory bed"?
2.List the types of capillaries and organeswhich they meet
3. What is the principle of the interaction of the dynamic conditions of the structure of the vessels
4. Arteriovenular anastomoses.

Tests

1.Endothelial cells:
A. have an elongated, flattened shape,poor in organelles B. connect to the basal membrane with the help of chromosomes
C. cover the vessels externally
D. have a circular shape
E. have many organelles
2.Adventitious cells:
A. have a circular shape
B. meet in the middle layers of capillaries
C. have pericytes
D. highly specialized E. cells are cambial polypotent
3.Shells found in vessels(uncountable capillaries):
A. tunicamucosa,tunica media,tunicaadventicia
B. tunicaserosa,tunicamedia,tunicaadventicia
C. tunicaintima,tunicamedia,tunicaadventicia

D. tunicamucosa,tunicamedia,tunicaserosa
E. tunicamucosa,tunicasubmucosa,tunicaadventicia
4.Carteriaelastic type refers to:
A. aorta
B. hepaticarteria
C. Liver circle
D. femoral arteria
E. radiation arteria
5.Carteriaelastic type refers to:
A. renal arteria
B. ulnar arteria
C. pulmonary arteria
D. Vilisievkrug
E. upper thyroid artery
6.Primary blood vessels develop in:
A. mesodermeamnion
B. endodermeamnion
C. mesodermeamnion
D. mesodermeamnion
E. mesodermeallantois
7.Fenestrated capillaries:
A. occur
in endocrine glands B. Fenesters are
specialized
subcellular compounds between endothelial cells C. Occur in light
D. Basal membranes have pores
E. Fenesters reduce permeability and weaken the transport of substances
8.Capillaries:
A. They are constantly forming in the body
B. They are composed of
C. Sinusoidal
capillaries have a continuous basal membrane D. sinusoidal capillaries are found in the organs of hematopoiesis
E. Regulate arterial pressure
9.Capillaries:
A. Transport
blood to organs B. Somatic
capillaries meet the liver C. The wall is made of three shells
D. The walls are made of elastic fibers and
E. provide gas exchange of materials
10.Collective veins:
A. the
walls of the walls of three shells B. begin with venous capillaries
C. fall into veins
D. have only inner and middle shells

Tasks

1. An electron micrograph shows a transversely cut vessel, the lumen of which is filled with an erythrocyte, and the wall consists of three layers. The first layer is represented by a flattened cell,

in cytoplasm, which is clearly expressed by micropinocytosis bubbles.The cell lies on the basement membrane. The second layer is formed by the basement membrane and pericyte, the third layer is the adventitial cell. What is the name of the court?
2. The preparation shows the wall of a blood vessel formed by two types of cells. Name the vessel and the cells forming its wall
3. The preparation shows blood vessels, around which there is a large accumulation of blood cells migrated from them in the adjacent connective tissue. What are these vessels called? Which blood cells migrated?

Lesson No. 3
1. Topic: Vienna. Lymphatic suckers.
2. Purpose:
Knowledge of the microscopic and ultramicroscopic structure of veins
Knowledge of the microscopic and ultramicroscopic structure of lymphatic vessels
3. Learning objectives:
To be able to identify veins of various types in drugs
Understanding the building features of veins in the upper and lower parts of the body
4. The main issues of the topic:
Complete the tasks.
1. Write down the nutrition features of the inner, middle and outer shells of the veins
2.Fill out the blue roots form shown in the table.
Bone veins Upper vein hollow veins of the arms leg veins Lower vein hollow
Handout
The microscope
Histological micro-preparations
1. Pelvic Vein. Stained with hemotoxylin-eosin

5. The main forms / methods / technologies of learning to achieve the LO discipline: work in small groups, checklist of histopreparations, microphotographs

6. Types of control to assess the level of achievement of the LO discipline: a checklist for evaluating a practical lesson.

7. Literature.
Main literature
1. Inderbir Singh. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2016.-302 p.ПереводГистологиячеловека
2. Dudek Ronald W. Embryology / Ronald W. Dudek. - 5th ed. - [s. l.] : Wolters Kluwer, 2014. - 158 p. Перевод заглавия: Эмбриология
3. Gartner Leslie P. Cell Biology and Histology / Leslie P. Gartner. - 8th ed. - [s. l.] :Wolters Kluwer, 2019. - 436 p. - (BRS. Board Review Series)Переводзаглавия: Клеточнаябиологияигистология
Additional literature
Textbook of Human Histology.Inderbir Singh /Sixth Edition/Inderbir Singh 2010.-386 p.
Перевод Учебник по гистологии человека
Electronic publications

1. ATLAS OF HISTOLOGY with Functional Correlations. Thirteenth Edition, Wolters Kluwer.2017.- 1102 p.
2. Theory and practice of Histological techniques.Eighth edition.Elsevier Limited.2019.-554 p.
3. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2011.-386 p.
4. USMLE Step 1.Lecture Notes 2018.by Kaplan.2018.-425 p/
5. Zhumabayeva, S.E., Boken, T.S. Cytology and histology : Educational-methodical complex. . - Kokshetau: KGU, 2017. - 101 p.http://rmebrk.kz/
6. Бородулина, О.В.Цитология и гистология – Cytology and histology : Практикум. / Костанайский гос. педагогический университет им. У. Султангазина. - Костанай: КГПУ им.У.Султангазина, 2020. - 100 с. - http://rmebrk.kz/

8. Control

Questions

1. The general plan of the structure of the Vienna walls
2. How are veins classified
3. Features of the structure of lymphatic capillaries
4. The concept of classification of lymphatic vessels and their structure

Tests:

1.Sac-like vessel initiated by blockage
A. Hemocapillary
B. Lymphocapillary
C. Arteriole
D. Postcapillary venule
E. Accumulative venule
2. Refers to the non-muscular vein:
A. Bony veins
B. High vena cava
C. Femoral veins
D. Brachial veins
E. Inferior vena cava
3. Refers to the non-muscular vein:
A. High vena cava
B. Inferior vena cava
C. Retinal veins
D. Femoral vein
E. Occipital vein
4. Refers to the mandibular vein
A. Elastic vein
B. Non-muscular vein
C. Vein with well-developed muscle tissue
D. Vein with moderately developed muscle tissue
E. Vein with poorly developed muscle tissue
5. Refers to the vein with valves
A. High vena cava
B. Jugular veins

C. Femoral veins
D. Inferior vena cava

Tasks

1. In preparations stained with hematoxylin-eosin, two large muscle-type veins are shown. On the wall of one of them, in the middle membrane, a few not very many smooth muscle cells are visible; on the wall of the second vein, smooth muscle cells are found in all three membranes. Which of the described veins belongs to the lower body and why?
2. 2 blood vessels were presented on the histopreparation. In one of them, vascular roots are visible in the middle and outer shells, in the other-only in the outer shell. Which of these drugs is intravenous?
3. Histological analysis of 2 large vessels showed that one of them has poorly developed smooth myocytes in the cortex, while the other has them present in all membranes, especially in the outer ones. Name these roots.

Lesson No. 4.

1. Topic: The heart

2. Purpose:

Knowledge of the microscopic and ultramicroscopic structure of the heart

3. Learning objectives :

Get an idea of the main stages of histogenesis and organogenesis of the heart
Learn how to identify the membranes of the heart from the drug
Be able to understand the morphofunctional features of the contractile and conduction systems of the heart

4. The main issues of the topic:

Complete the tasks.

1. Fill in the table of the tissue composition of the membranes of the walls of the heart.

Endocardium	Myocardium	Epicard

2. Characterize the degree (more or less) of the development of organelles and inclusions in working cardiomyocytes and cells of the cardiac conduction system.

Myocytes	Organelles and compounds		
	mitochondria	myofibrils	glycogens
Рабочие клетки			
Клетки проводящей системы			

Handout

1. The microscope
2. histological micro-preparations
1. the wall of the heart. Stained with hematoxylin-eosin.

5. The main forms / methods / technologies of learning to achieve the LO discipline: work in small groups, checklist of histopreparations, microphotographs

6. Types of control to assess the level of achievement of the LO discipline: a checklist for evaluating a practical lesson.

7. Literature.

Main literature

1. Inderbir Singh. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2016.-302 p.ПереводГистологиячеловека

2. Dudek Ronald W. Embryology / Ronald W. Dudek. - 5th ed. - [s. l.] : Wolters Kluwer, 2014. - 158 p. Перевод заглавия: Эмбриология

3. Gartner Leslie P. Cell Biology and Histology / Leslie P. Gartner. - 8th ed. - [s. l.] :Wolters Kluwer, 2019. - 436 p. - (BRS. Board Review Series)Переводзаглавия: Клеточнаябиологияигистология

Additional literature

Textbook of Human Histology.Inderbir Singh /Sixth Edition/Inderbir Singh 2010.-386 p.
Перевод Учебник по гистологии человека

Electronic publications

1. ATLAS OF HISTOLOGY with Functional Correlations. Thirteenth Edition, Wolters Kluwer.2017.- 1102 p.

2. Theory and practice of Histological techniques.Eighth edition.Elsevier Limited.2019.-554 p.

3. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2011.-386 p.

4. USMLE Step 1.Lecture Notes 2018.by Kaplan.2018.-425 p/

5. Zhumabayeva, S.E., Boken, T.S. Cytology and histology : Educational-methodical complex. . - Kokshetau: KGU, 2017. - 101 p.http://rmebrk.kz/

6. Бородулина, О.В.Цитология и гистология – Cytology and histology : Практикум. / Костанайский гос. педагогический университет им. У. Султангазина. - Костанай: КГПУ им.У.Султангазина, 2020. - 100 с. - http://rmebrk.kz/

8. Control

Questions

1. The membranes of the heart and their tissue composition
2. structural and functional units of striated heart muscle tissue
3. Features and functional significance of myocardial muscle tissue of typical and atypical type.
4. Age – related structural features of the heart
5. Endocrine function of atrial cardiomyocytes

Tests:

1. The heart develops
A. Mesoderm
B. Ectoderm
C. Endoderm
D. Visceral lobe of splanchnotoma
E. Parietal petiole of splanchenatoma
2. The endocardium and blood vessels develop.
A. Mesenchyme
B. Segmental limbs of nephrogonotoma C. Sclerotoma
D. Endoderm
E. Ectoderm

3..Cardiomyocytes interact with each other
A. Synapse
B. Disc insertion
C. Desmosome
D. Partial desmosome
E. Anastamosis
4. The pacemaker cells of the conducting system are located
A. In the Gis bundle
B. In the Purkinje fiber
C. In the sinoatrial node
D. In the atrioventricular node
E. In the Bachmann group
5. Occurs in cardiomyocytes
A. Aerobic metabolism
B. Anaerobic metabolism
C. Gluconeogenesis
D. Phosphorylation process
E. Proteolysis

Tasks

1. Two preparations of striated muscle tissue are given. While one of them contains a lot of nuclei under the fiber sheath, the second drug shows cells whose nuclei are located in the central part. Which of these drugs is the myocardium?
2.In a cardiac preparation stained with hematoxylin-eosin, two types of fibers are visible: the cytoplasm of one of them is colored in an intense pink color, transverse lines and accessory discs are visible; the cytoplasm of the second fiber is colored in a faded color, the diameter of the fibers is larger, the horizontal lines are not visible. What types of myocytes have such fibers?
3. Two-electron micrographs of cardiomyocytes are presented. One shows a cardiomyocyte with a large number of myofibrils, myofibrils are located parallel to each other, form a common transverse band of cytoplasm and have many mitochondria, which in a small amount of hyaloplasm are located next to myofibrils. The second preparation shows a cardiomyocyte in which several striated myofibrils are located randomly. There are fewer organelles in the cytoplasm and more hyaloplasm. Which cardiomyocytes do they belong to?
4. In hypoxia, at some point, working cardiomyocytes lack oxygen, and in this case, the cells of the conducting system suffer less. Comment on this fact, knowing the morphological and histochemical features of atypical heart muscle tissue.

Lesson No. 5

1. Subject: Nasal cavity, nasopharynx, larynx

2. Purpose :

Knowledge of the microscopic and ultramicroscopic structure of the respiratory tract of the respiratory system

3. Learning objectives:

To learn how to identify the constituent elements of the respiratory system.
Determination of the respiratory tract and its structural features.
Understanding the role of the respiratory tract in performing respiratory function
Identify the respiratory units and their structural and functional units.

4. The main issues of the topic:

Completing tasks

1. in the table, specify the design features of the various sections of the airway

Respiratory tract departments	The mucous membrane			Mucus The layer under	fibrous cartilaginous membrane	adventitious shell
	Epithelium	Individual board	Muscle plate			
Nasal cavity						
of the pharynx						

Microscopes
Micro-products for reading
1. the mucous membrane of the nasal cavity. Hemotoxylin-stained eosin 202suret

5. The main forms / methods / technologies of learning to achieve the LO discipline: work in small groups, checklist of histopreparations, microphotographs

6. Types of control to assess the level of achievement of the LO discipline: a checklist for evaluating a practical lesson.

7. Literature.
Main literature

1. Inderbir Singh. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2016.-302 p.ПереводГистологиячеловека
2. Dudek Ronald W. Embryology / Ronald W. Dudek. - 5th ed. - [s. l.] : Wolters Kluwer, 2014. - 158 p. Перевод заглавия: Эмбриология
3. Gartner Leslie P. Cell Biology and Histology / Leslie P. Gartner. - 8th ed. - [s. l.] :Wolters Kluwer, 2019. - 436 p. - (BRS. Board Review Series)Переводзаглавия: Клеточнаябиологияигистология

Additional literature

Textbook of Human Histology.Inderbir Singh /Sixth Edition/Inderbir Singh 2010.-386 p.
Перевод Учебник по гистологии человека

Electronic publications

1. ATLAS OF HISTOLOGY with Functional Correlations. Thirteenth Edition, Wolters Kluwer.2017.- 1102 p.
2. Theory and practice of Histological techniques.Eighth edition.Elsevier Limited.2019.-554 p.
3. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2011.-386 p.
4. USMLE Step 1.Lecture Notes 2018.by Kaplan.2018.-425 p/
5. Zhumabayeva, S.E., Boken, T.S. Cytology and histology : Educational-methodical complex. . - Kokshetau: KGU, 2017. - 101 p.http://rmebrk.kz/
6. Бородулина, О.В.Цитология и гистология – Cytology and histology : Практикум. / Костанайский гос. педагогический университет им. У. Султангазина. - Костанай: КГПУ им.У.Султангазина, 2020. - 100 с. - http://rmebrk.kz/

8. Control
Questions

1. Morphofunctional characteristics of the respiratory system
2. Classification, sources and ways of development
3. Features of the structure of the respiratory tract
4. The structure of the nasal cavity
5. The structure of the pharynx, the walls of the larynx

Tests

1.Claire's cells:
A. Cells without cilia with a domed roof
B. goblet-shaped cells
C. ciliated cells
D. cellular meshes
E. cubic cells
2.Cartilage is located in the form of an island:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in large bronchi in the lungs
E. in large extrapulmonary bronchi
3.Which epithelium is characteristic of small-caliber bronchi:
A. multilayered cilia
B. multilayer flat non-horny
C. double-layered
D. multilayered flat without horny
E. variable epithelium
4. The muscular plate of the mucous membrane is clearly visible:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in large bronchi in the lungs
E. in large extrapulmonary bronchi
5.There are no glands at the base of the cream base:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in large bronchi in the lungs
E. in large extrapulmonary bronchi
6. Hormones in the trachea... Secretes:
A. goblet cells
B. protein-cream gland cells
C. connective tissue
cells D. ciliary cells
E. endocrine cells
7. Elastic cartilage occurs:
A. in the main bronchus
B. in the middle bronchus
C. in the small bronchus
D. in the terminal bronchi
E. in the bronchi of the respiratory tract
8. The inner lining of the respiratory tract is sewn:

A. with connective tissue
B. with muscle tissue
C. with epithelial tissue
D. with nervous tissue
E. with cartilage tissue
9. It has a receptor function:
A. epithelial cells (cilia)
B. goblet cells
C. neurosecretory cells
D. endocrine cells
E. Claire cells

Tasks

1.Inhaling dust, polluted air enters the respiratory tract and alveoli. Which cells of the respiratory tract are involved in air purification and how? How do foreign particles get into the interalveolar connective tissue?
2. The physiotherapeutic effect (water, air baths) stimulates the activity of the respiratory system. What morphological elements are included in the work in this case?
3. When inhaling caustic gases, the glottis closes, and when inhaling mountain or sea air, it expands. What structures are involved and what is the mechanism of the ongoing changes?

Lesson No. 6

1. Topic: Larynx and main bronchi.

2. Purpose :

Knowledge of the microscopic and ultramicroscopic structure of the respiratory tract of the respiratory system

3. Learning objectives:

To learn how to identify the constituent elements of the respiratory system.
Determination of the respiratory tract and its structural features.
Understanding the role of the respiratory tract in performing respiratory function
Identify the respiratory units and their structural and functional units.

4. The main issues of the topic:

Completing tasks

1. In the table, specify the design features of the various sections of the airway

Duct partitions	The mucous membrane			Mucus The layer under	fibrous cartilaginous membrane	adventitious shell
	Epithelium	Individual board	Muscle plate			
Nasal cavity						
of the pharynx						
larynx						
Larynx						
Primary bronchus						

Microscopes
Micro-products for reading

1. larynx. Stained with hemotoxylin-eosin

5. The main forms / methods / technologies of learning to achieve the LO discipline: work in small groups, checklist of histopreparations, microphotographs

6. Types of control to assess the level of achievement of the LO discipline: a checklist for evaluating a practical lesson.

7. Literature.

Main literature

1. Inderbir Singh. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2016.-302 p.ПереводГистологиячеловека
2. Dudek Ronald W. Embryology / Ronald W. Dudek. - 5th ed. - [s. l.] : Wolters Kluwer, 2014. - 158 p. Перевод заглавия: Эмбриология
3. Gartner Leslie P. Cell Biology and Histology / Leslie P. Gartner. - 8th ed. - [s. l.] :Wolters Kluwer, 2019. - 436 p. - (BRS. Board Review Series)Переводзаглавия: Клеточнаябиологияигистология

Additional literature

Textbook of Human Histology.Inderbir Singh /Sixth Edition/Inderbir Singh 2010.-386 p.
Перевод Учебник по гистологии человека

Electronic publications

1. ATLAS OF HISTOLOGY with Functional Correlations. Thirteenth Edition, Wolters Kluwer.2017.- 1102 p.
2. Theory and practice of Histological techniques.Eighth edition.Elsevier Limited.2019.-554 p.
3. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2011.-386 p.
4. USMLE Step 1.Lecture Notes 2018.by Kaplan.2018.-425 p/
5. Zhumabayeva, S.E., Boken, T.S. Cytology and histology : Educational-methodical complex. . - Kokshetau: KGU, 2017. - 101 p.http://rmebrk.kz/
6. Бородулина, О.В.Цитология и гистология – Cytology and histology : Практикум. / Костанайский гос. педагогический университет им. У. Султангазина. - Костанай: КГПУ им.У.Султангазина, 2020. - 100 с. - http://rmebrk.kz/

8. Control

Questions

1. Morphofunctional characteristics of the respiratory system
2. Classification, sources and ways of development
3. Features of the structure of the respiratory tract
4. The structure of the nasal cavity
5. The structure of the laryngeal wall
6. Bronchial tree

Tests

1.Claire's cells:
A. Cells without cilia with a domed roof
B. goblet-shaped cells

C. ciliated cells
D. cellular meshes
E. cubic cells
2. Cartilage is located in the form of an island:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in the large bronchi in the lungs
E. in large extrapulmonary bronchi
3.Which epithelium is characteristic of small-caliber bronchi:
A. multilayered cilia
B. multilayer flat non-horny
C. double-layered
D. multilayered flat without horny
E. variable epithelium
4. The muscular plate of the mucous membrane is clearly visible:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in large bronchi in the lungs
E. in large extrapulmonary bronchi
5.There are no glands at the base of the cream base:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in the large bronchi in the lungs
E. in large extrapulmonary bronchi
6. Hormones in the trachea... Secretes:
A. goblet cells
B. protein-cream gland cells
C. connective tissue
cells D. ciliary cells
E. endocrine cells
7. Elastic cartilage occurs:
A. in the main bronchus
B. in the middle bronchus
C. in the small bronchus
D. in the terminal bronchi
E. in the bronchi of the respiratory tract
8. The inner lining of the respiratory tract is sewn:
A. with connective tissue
B. with muscle tissue
C. with epithelial tissue
D. with nervous tissue
E. with cartilage tissue
9. It has a receptor function:
A. epithelial cells (cilia)
B. goblet cells
C. neurosecretory cells

D. endocrine cells
E. Claire cells

Tasks

1. In which bronchi do all the membranes develop, and the fibrous-cartilaginous base contains two or three large plates of hyaline cartilaginous tissue?
2. Microscopy of the larynx revealed the last parts of the excretory duct and gland. It has various tinctorial signs in the cytoplasm of glandular cells. In some cells, pronounced basophilia is observed, the cytoplasm of other cells is poorly colored. What is the chemical composition of the secretions produced by these glands?
3. Determine whether the respiratory tract belongs to 2 histological preparations by wall structures: the first - the mucous membrane has a multi–row epithelium, glands and large plates of hyaline cartilage are well expressed, the second - a 2-row mucous epithelium, without glands, without cartilaginous plates.
4. Two histological preparations of tubular hollow structures are presented. In the first, the epithelium is multilayered, without flat horns; in the second, it is multi-row ciliated. There are transversely cut elastic fibers on the own plate of the mucous membrane of the second preparation. Define the members of the structures.

Lesson No. 7

1. Topic: The breathing part. Pulmonary acinus.

2. Purpose :

• Knowledge of the microscopic and ultramicroscopic structure of the respiratory tract of the respiratory system
• Study the microscopic ultramicroscopic structure of the respiratory part of the lungs .

3. Learning objectives:

• Learn to identify the constituent elements of the respiratory system.
• Determination of the respiratory tract and its structural features.
• Understanding the role of the respiratory tract in performing respiratory function
• Identify respiratory units and their structural and functional units.
• Determination of the role of the respiratory department in the respiratory function of the lungs .

4. The main issues of the topic:

Completing tasks

1. In the table, specify the design features of the various sections of the airway

Duct partitions	The mucous membrane			Mucus The layer under	fibrous cartilaginous membrane	adventitious shell
	Epithelium	Individual board	Muscle plate			
Nasal cavity						
of the pharynx						
larynx						
Larynx						
Primary bronchus						
Large bronchus						
Small						

bronchus bronchiola						

2. Enter the names of the sections of the acinus in the table and indicate their structural features

Departments of acinus	Type of epithelium	Muscle plate	Adventitious shell

Microscopes
Micro-products for reading
1. The lungs. Stained with hematoxylin-eosin

5. The main forms / methods / technologies of learning to achieve the LO discipline: work in small groups, checklist of histopreparations, microphotographs

6. Types of control to assess the level of achievement of the LO discipline: a checklist for evaluating a practical lesson.

7. Literature.
Main literature

1. Inderbir Singh. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2016.-302 p.ПереводГистологиячеловека
2. Dudek Ronald W. Embryology / Ronald W. Dudek. - 5th ed. - [s. l.] : Wolters Kluwer, 2014. - 158 p. Перевод заглавия: Эмбриология
3. Gartner Leslie P. Cell Biology and Histology / Leslie P. Gartner. - 8th ed. - [s. l.] :Wolters Kluwer, 2019. - 436 p. - (BRS. Board Review Series)Переводзаглавия: Клеточнаябиологияигистология

Additional literature

Textbook of Human Histology.Inderbir Singh /Sixth Edition/Inderbir Singh 2010.-386 p.
Перевод Учебник по гистологии человека

Electronic publications

1. ATLAS OF HISTOLOGY with Functional Correlations. Thirteenth Edition, Wolters Kluwer.2017.- 1102 p.
2. Theory and practice of Histological techniques.Eighth edition.Elsevier Limited.2019.-554 p.
3. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2011.-386 p.
4. USMLE Step 1.Lecture Notes 2018.by Kaplan.2018.-425 p/
5. Zhumabayeva, S.E., Boken, T.S. Cytology and histology : Educational-methodical complex. . - Kokshetau: KGU, 2017. - 101 p.http://rmebrk.kz/
6. Бородулина, О.В.Цитология и гистология – Cytology and histology : Практикум. / Костанайский гос. педагогический университет им. У. Султангазина. - Костанай: КГПУ им.У.Султангазина, 2020. - 100 с. - http://rmebrk.kz/

8. Control
Questions
1. Morphofunctional characteristics of the respiratory system
2. Classification, sources and ways of development

3. Bronchial tree
4. Morphofunctional characteristics of the lungs.
5. The respiratory department of the lungs.

Tests

1. Claire's cells:
A. Cells without cilia with a domed roof
B. goblet-shaped cells
C. ciliated cells
D. cellular meshes
E. cubic cells
2. Cartilage is located in the shape of an island:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in large bronchi in the lungs
E. in large extrapulmonary bronchi
3. Which epithelium is characteristic of small-caliber bronchi:
A. multilayered cilia
B. multilayer flat non-horny
C. double-layered
D. multilayered flat without horny
E. variable epithelium
4. The muscular plate of the mucous membrane looks good.:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in large bronchi in the lungs
E. in large extrapulmonary bronchi
5. There are no glands at the base of the cream base.:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in large bronchi in the lungs
E. in large extrapulmonary bronchi
6. Hormones in the trachea... Secretes:
A. goblet cells
B. protein-cream gland cells
C. connective tissue
cells D. ciliary cells
E. endocrine cells
7. Elastic cartilage occurs:
A. in the main bronchus
B. in the middle bronchus
C. in the small bronchus
D. in the terminal bronchi
E. in the bronchi of the respiratory tract
8. The inner lining of the respiratory tract is sewn:
A. with connective tissue
B. with muscle tissue

C. with epithelial tissue
D. with nervous tissue
E. with cartilage tissue
9. It has a receptor function:
A. epithelial cells (cilia)
B. goblet cells
C. neurosecretory cells
D. endocrine cells
E. Claire
cells 10. Epithelial cells unite:
A. desmosome
B. adhesion
C. partial desmosome
D. intermediate discs
E. synapse

Tasks

1.Inhaling dust, polluted air enters the respiratory tract and alveoli. Which cells of the respiratory tract are involved in air purification and how? How do foreign particles get into the interalveolar connective tissue?

2. Patients with bronchial asthma sometimes have an attack of suffocation due to severe compression of small bronchi. What structural elements of the bronchi cause their spasms? Why do smaller bronchi contract more than others?

3. In which bronchi do all membranes develop, and the fibrous-cartilaginous base contains two or three large plates of hyaline cartilage tissue?

4 .Electron micrographs of the alveoli show an alveolocyte with numerous electron osmophilia in the cytoplasm. What kind of cell is it and what role does it play in protecting alveolar cells?

5. In the lung preparation, you found that the two structures are similar to each other. Two of them are lined with attached epithelium, both have a wall consisting of mucous membranes and protein membranes. However, one of the structures has a large developed lamellar muscle and a large voluminous loose fibrous unformed connective tissue. At what level of the airway are you microscopizing a part?

Lesson No. 8

1. Topic: Aerogematic barrier. Pleura.

2. Purpose :

Pathways of the respiratory system microscopic and ultramicroscopic structural education department

A microscopic ultramicroscopic building block of your respiratory part.

3. Learning objectives:

• Learn to identify the elementary elements of the respiratory system.
• Analysis of the structural specificity of the respiratory tract and their.
• Awareness of the role in breathing that performs the respiratory function
• Definition of tynysu divisions and their construction and functional departments.
• Determination of the respiratory function of the hump of the role of the respiratory department .

4. The main issues of the topic:

Completing tasks

Write down the structural components of the aerogematic barrier in your notebooks

Microscopes
Micro-products for reading
Lungs. Alveolus and alveolar interval Figure 215

5. The main forms / methods / technologies of learning to achieve the LO discipline: work in small groups, checklist of histopreparations, microphotographs

6. Types of control to assess the level of achievement of the LO discipline: a checklist for evaluating a practical lesson.

7. Literature.

Main literature

1. Inderbir Singh. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2016.-302 p.ПереводГистологиячеловека
2. Dudek Ronald W. Embryology / Ronald W. Dudek. - 5th ed. - [s. l.] : Wolters Kluwer, 2014. - 158 p. Перевод заглавия: Эмбриология
3. Gartner Leslie P. Cell Biology and Histology / Leslie P. Gartner. - 8th ed. - [s. l.] :Wolters Kluwer, 2019. - 436 p. - (BRS. Board Review Series)Переводзаглавия: Клеточнаябиологияигистология

Additional literature

Textbook of Human Histology.Inderbir Singh /Sixth Edition/Inderbir Singh 2010.-386 p.
Перевод Учебник по гистологии человека

Electronic publications

1. ATLAS OF HISTOLOGY with Functional Correlations. Thirteenth Edition, Wolters Kluwer.2017.- 1102 p.
2. Theory and practice of Histological techniques.Eighth edition.Elsevier Limited.2019.-554 p.
3. Textbook of HumanHistology.With Color Atlas and Practical Guide/8 thEdition.Jaypee Brothers Medical Publishers .2011.-386 p.
4. USMLE Step 1.Lecture Notes 2018.by Kaplan.2018.-425 p/
5. Zhumabayeva, S.E., Boken, T.S. Cytology and histology : Educational-methodical complex. . - Kokshetau: KGU, 2017. - 101 p.http://rmebrk.kz/
6. Бородулина, О.В.Цитология и гистология – Cytology and histology : Практикум. / Костанайский гос. педагогический университет им. У. Султангазина. - Костанай: КГПУ им.У.Султангазина, 2020. - 100 с. - http://rmebrk.kz/

8. Control

Questions

1. Morphofunctional characteristics of the respiratory system
2. Classification, sources and ways of development
3. Features of the structure of the respiratory tract
4. The structure of the nasal cavity
5. The structure of the laryngeal wall
6. Bronchial tree
7. Morphofunctional characteristics of the lungs.
8. The respiratory department of the lungs.

9.Blood air resistance.

Tests

1. Claire's cells:
A. Cells without cilia with a domed roof
B. goblet-shaped cells
C. ciliated cells
D. cellular meshes
E. cubic cells
2. Cartilage is located in the shape of an island:
A. mainly in the bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in the large bronchi in the lungs
E. in the large extrapulmonary bronchi
3. Which epithelium is characteristic of small-caliber bronchi:
A. multilayered cilia
B. multilayer flat non-horny
C. double-layered
D. multilayered flat without horny
E. variable epithelium
4. The muscular plate of the mucous membrane looks good.:
A. in the main bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in large bronchi in the lungs
E. in large extrapulmonary bronchi
5. There are no glands at the base of the cream base.:
A. mainly in the bronchus
B. in the small bronchus
C. in the medium bronchial tubes
D. in the large bronchi in the lungs
E. in the large extrapulmonary bronchi
6. Hormones in the trachea... Secretes:
A. goblet cells
B. protein-cream gland cells
C. connective tissue
cells D. ciliary cells
E. endocrine cells
7. Elastic cartilage occurs:
A. in the main bronchus
B. in the middle bronchus
C. in the small bronchus
D. in the terminal bronchi
E. in the bronchi of the respiratory tract
8. The inner lining of the respiratory tract is sewn:
A. with connective tissue
B. with muscle tissue
C. with epithelial tissue
D. with nerve tissue

E. with cartilage tissue
9. Has a receptor function:
A. epithelial cells (cilia)
B. goblet cells
C. neurosecretory cells
D. endocrine cells
E. Claire cells
10. Epithelial cells unite:
A. desmosome
B. adhesion
C. partial desmosome
D. intermediate discs
E. synapse

Tasks

1. Attacks of suffocation in bronchial asthma are associated with a violation of the normal functioning (spasm) of a number of elements of the respiratory tract. Name these elements and give a basis for your vision.
2. With prolonged smoking, the structure of the alveolar epithelium changes dramatically until its death. The surfactant is damaged, breathing is sharply disrupted. What is the reason for this?
3. A number of changes are observed in the structures of respiratory bronchioles associated with an increase in plastic processes in myocytes, hypertrophy of the nuclei and an increase in the mitotic index during dosed physical exertion. What structural changes are observed in the wall, and what consequences will this lead to?
4. During prolonged smoking or inhalation of dusty air, smoke and dust particles accumulate in the lung tissue and regional lymph nodes, as a result of which the color of these organs changes from pink to gray. What happens to dust and smoke particles when they enter the lumen of the alveoli and how are they formed in the regional lymph nodes?