METHODOLOGICAL GUIDELINES FOR PRACTICAL EXERCISES

Discipline: General pathology
Code : OR 3214
EP name and cipher: 6B10115- «Medicine»
Amount of study hours/credits: 180/6
Course and semester of study: III course; V semester
The volume of practical (seminar) classes: 24 hours

Shymkent, 2024

Methodical instructions for practical classes are developed in accordance with the working program of the discipline (syllabus) "General Pathology" and discussed at the meeting of the department

Protocol No. 11 « 26 » 05 2024.

Head of the Department _____ Sadykova A.Sh.

No. 1

1. **Topic: Subject, aims, objectives, objectives, objects, methods and levels of study of pathologic anatomy**
2. **Purpose:** To study the content, objectives methods of pathological anatomy and distinguish from other pathological processes based on their morphological characterization.
3. **Learning Objectives:** Knowledge of the topic is necessary for mastering the course of pathological anatomy. In the study of clinical disciplines and in the practical work of the doctor, knowledge of this topic is necessary to assess the value of the course of pathological anatomy

4. The main questions of the topic are:

1. Content and objectives of pathologic anatomy.
2. Objects, methods and levels of study of pathologic anatomy.

5. The main forms /methods/techniques of teaching to achieve the final ROs in general pathology: Discussion of the topic, microscopy, description of macrophotography, description of microphotography. The evaluation criterion is shown in "Appendix #1"

6. Literature: see application No. 3.

7.Control (questions):

1. definition of pathologic anatomy.
2. Objectives of pathologic anatomy.
3. Study questions of pathologic anatomy.
4. Methods of study of pathologic anatomy.
5. Levels of study of pathologic anatomy.

No. 2

Topic: Cell pathology. Disorder of protein metabolism

1.Objective: Learn to determine the causes, mechanisms of development and functional significance of parenchymatous dystrophies from other pathological processes based on their morphological characteristics.

2.Learning Objectives: Knowledge of the topic is necessary for mastering other topics of the general course of pathological anatomy, as well as pathological anatomy of diseases (private course). When studying clinical disciplines and in the practical work of a doctor, knowledge of parenchymatous and stromal-vascular dystrophies is necessary for clinical and anatomical analysis.

3.The main questions of the topic are:

1. definition of cell pathology.
2. Types of cellular pathologies.
3. Causes of cellular pathologies.
4. Mechanisms of appearance of pathologic structures in cells
5. Pathology of the cell nucleus.
6. Pathology of the cytoplasm.
7. The outcome of different types of cell pathology.
8. Definition of parenchymatous dystrophies.
9. Types of parenchymatous dystrophies.

10. Parenchymatous protein dystrophies.
11. Parenchymatous fatty dystrophies.
12. Parenchymatous carbohydrate dystrophies.

5. The main forms /methods/techniques of teaching to achieve the final ROs in general pathology: Discussion of the topic, microscopy, description of macrophotography, description of microphotography. The evaluation criterion is shown in "Appendix #1"

6.Literature: "Appendix No. 2"

7. Control (questions)

1. Definition of alteration.
2.Causes of alteration.
3.Cellular responses to damaging influences.
4.Mechanisms of action of damaging agents.
5.Pathology of the cell nucleus. Changes in the structure and size of the nucleus.
6.Changes in the shape of the nucleus.
7.Change in the number of nuclei.
8.Changes in the structure and size of the nuclei.
9.Nuclear inclusions.
10.Changes in the nuclear envelope.
11.Delay of cells in prophase.
12.Damage to the mitotic apparatus.
13.Disruption of cytotomy.
14.Changes in the number of chromosomes.
15.Changes in the structure of chromosomes.
16.Chromosomal diseases. Trisomy of autosomes, monosomy of sex X chromosome, trisomy of sex chromosomes.
17.Pathology of the cytoplasm. Alterations of cell membranes.
18.Pathology of the endoplasmic network.
19.Pathology of the Golgi complex.
20.Pathology of the mitochondria.
21.Pathology of lysosomes.
22.Pathology of peroxisomes.
23.Pathology of the cytoskeleton.
24.Pathology of microtubules.
25.Pathology of the plasma membrane.
26.Pathology of cell junctions.
27.Definition of dystrophy.
28.Mechanisms of trophic regulation.
29.Morphogenesis of dystrophies.
30.Classification of dystrophies.
31.Definition, etiology, pathogenesis, morphogenesis of parenchymatous dystrophies.
32.Types of parenchymatous protein dystrophies.

33.Characterization of hyaline drop dystrophy: macroscopic signs, microscopic signs, parenchymatous organ changes, outcome.

34.Characteristics of hydropic dystrophy: macroscopic signs, microscopic signs, changes of parenchymatous organs, outcome.

35.Characterization of horny dystrophy: macroscopic signs, microscopic signs, organ changes, outcome.

36.Definition, etiology, pathogenesis, morphogenesis of parenchymatous fatty dystrophies. 3.

37.morphological characterization of parenchymatous fatty dystrophies of liver, heart, kidneys: macroscopic signs, microscopic signs, changes of parenchymatous organs, outcome.

38.Types of parenchymatous carbohydrate dystrophies.

39.Carbohydrate dystrophies associated with disorders of glycogen metabolism: macroscopic signs, microscopic signs, organ changes, outcome.

40.Carbohydrate dystrophies associated with disorders of glycoprotein metabolism: macroscopic signs, microscopic signs, organ changes, outcome.

41.Diseases of accumulation - thesaurismoses, general characteristic, classification.

42.Fatty hereditary parenchymatous dystrophies: general characterization, types, causes, pathogenesis, morphogenesis.

43.Carbohydrate hereditary parenchymatous dystrophies: general characterization, types, causes, pathogenesis, morphogenesis.

No. 3

1. Topic: metabolic disorders

2.Objective: Learn to determine the causes, mechanisms of development and functional significance of mixed dystrophies from other pathological processes based on their morphological characterization.

3.Learning Objectives: Knowledge of the topic is necessary for mastering other topics of the general course of pathological anatomy, as well as pathological anatomy of diseases (private course). In the study of clinical disciplines and in the practical work of a doctor, knowledge of mixed, mineral dystrophies is necessary for clinical and anatomical analysis.

4.The main questions of the topic are:

1. definition of mixed dystrophies.
2. Mixed dystrophies and their types.
3. Classification of chromoproteins and their characterization.
4. Mechanism of chromoprotein metabolism disorders and their types.

5. The main forms /methods/techniques of teaching to achieve the final ROs in general pathology: Discussion of the topic, microscopy, description of macrophotography, description of microphotography. The evaluation criterion is shown in "Appendix #1"

6.Literature: "Appendix No. 2."

7.Control (questions:

1.Definition, classification of mixed dystrophies.

2.Disorder of chromoprotein metabolism. Disorder of metabolism of hemoglobinogenic pigments (ferritin, hemosiderin, hematoidin, hematins and porphyrin).

3.Specific staining for hemoglobinogenic pigments.

4.Hemosiderosis, types, characterization, causes, pathogenesis, morphogenesis, macroscopic and microscopic features, outcome.
5.Hemochromatosis, types, characterization, causes, pathogenesis, morphogenesis, macroscopic and microscopic features, outcome.
6.Bilirubin metabolism disorder. Definition of jaundice, types of jaundice, etiology, pathogenesis, morphogenesis, macro- and microscopic signs, outcome.
7.Hematoidin formation, general characterization.
8.formation of hematins (malarial pigment, hydrochloric acid hematin, porphyrin), general characterization, causes.
9.Disorders of metabolism of proteinogenic (tyrosinogenic) pigments. Melanin metabolism disorders, types, etiology, pathology, patho- and morphogenesis, macro- and microscopic signs, outcome.
10.Pigment of granules of enterochromaffin cells of the gastrointestinal tract, adrenochrome, general characterization.
11.Disorders of lipidogenic pigments metabolism (lipopigments - lipofuscin, ceroid and lipochromes), general characterization, causes of formation.
12.Lipofuscinosis, etiology, patho- and morphogenesis, macro- and microscopic signs, complications, outcome.
13.Nucleoprotein metabolism disorders, general characterization. Gout, types, patho- and morphogenesis, pathologic anatomy of joint and kidney lesions, complications. Outcome.
14.Urolithiasis, urolithiasis, uric acid infarction, general characterization.

No. 4

1.Topic: Necrosis
2.Objective: Will learn to define the etiology, pathogenesis, pathologic anatomy, morphogenesis of necrosis, and be able to distinguish between clinical and morphologic forms of necrosis and their most frequent complications.
3.Learning Objectives: Knowledge of the topic of necrosis is necessary for study in clinical departments. In practical work of a doctor it is necessary for clinical and anatomical analysis of sectional observations.
4.The main issues of the topic:
1. definition of necrosis.
2.Types of necrosis.
3.Causes and mechanisms of necrosis.
4.Macro- and microscopic manifestations of necrosis.
5.Functional significance, outcomes of necrosis.
5. The main forms /methods/techniques of teaching to achieve the final ROs in general pathology: Discussion of topic, microscopy, description of macrophotograph, description of microphotograph. The evaluation criterion is shown in "Appendix No. 1"
6.Literature: "Appendix No. 2"
7.Control (questions):

1. Definition of necrosis, stage of necrosis.
2.Macroscopic signs of necrotizing tissues.
3. microscopic signs of necrosis. Changes in nucleus, cytoplasm, intercellular substance. Examples of necrotic changes in organs and tissues.
4.Types of necrosis by mechanisms of development.
5.Classification of necrosis.
6.Clinical and morphologic forms of necrosis.
7.Coagulation necrosis, general characterization, pathanatomy, outcome.
8.Colliquation necrosis, general characterization, pathanatomy, outcome.
9.Colliquative necrosis, characterization.
10.Caseous necrosis, general characterization, pathanatomy, outcome.
11. Fat necrosis, general characterization, pathanatomy, outcome.
12.Fibrinoid necrosis, general characterization, pathanatomy, outcome.
13.Gangrene, definition, types, pathanatomy, outcome.
14.Infarction, definition, types, pathanatomy, outcome.
15.Sequestration, definition, definition, pathanatomy, outcome.
16.Apoptosis, general characterization, pathanatomy, outcome.
17.Autolysis, general characterization, pathanatomy, outcome.
18.Comparative characterization of necrosis, apoptosis and autolysis.
19. Outcomes of necrosis.

No. 5

1.Topic: Circulatory disorders.

2.Objective: Learn to identify the causes, mechanisms of blood and lymph circulation disorders, types of hemorrhage, distinguish them by morphological picture from other pathological processes.

3.Learning Objectives: Knowledge of the topic is necessary for mastering other topics of the general course of pathological anatomy, as well as pathological anatomy of diseases (private course). When studying clinical disciplines and in the practical work of a doctor, knowledge of blood and lymph circulation disorders is necessary for clinical and anatomical analysis.

4.The main questions of the topic are:

1.Definition of thrombosis.
2.Pathogenesis of thrombosis.
3.Name its causes.
4.Morphological characterization of thrombus. Distinguish thrombus from thromboembolus and postmortem blood clot.
5.Significance of thrombosis and its outcomes for the body.
6.Definition of emboli.
7.Significance of embolism to the organism.
8.Definition of plasmoragia.

9.Causes of the development of stasis.
10.Morphological characterization of infarction.
11.Significance and outcomes of thrombosis, embolism, infarction.
12.Definition of venous fullness.
13.Name the liver in chronic venous fullness?
14.Development of general venous hemorrhage?
15.Explain the development of local venous congestion?

5.The main forms /methods/techniques of teaching to achieve the final ROs in general pathology: Discussion of the topic, microscopy, description of macrophotography, description of microphotography. The evaluation criterion is shown in "Appendix #1"

6.Literature: "Appendix No. 3"

7.Control (questions):

1.Classification of disorders of the system of circulation of fluids in the body.
2. Arterial hyperemia or hyperemia, definition, types of general and local arterial hyperemia.
3. Angioneurotic (neuroparalytic) hyperemia, general characteristic, causes, types, examples.
4.Collateral hyperemia, general characterization, causes, types, examples.
5.Postanemic hyperemia, general characterization, causes, types, examples.
6.Vacant hyperemia, general characterization, causes, types, examples.
7.Inflammatory hyperemia, general characterization, causes, types, examples.
8.Arterial hyperemia on the background of arterial-venous fistula.
9.Circulatory disorders associated with damage to the vascular wall, changes in its permeability.
10.Circulatory disorders associated with a violation of homeostasis and rheological properties of blood.
11.Disorders of tissue fluid content and vascular permeability. Increase in the content of tissue fluid. Edema (dropsy), causes, pathogenesis, pathologic anatomy.
12.Types of edema: classification, characterization, outcome and significance of edema.
13.Decrease in tissue fluid content (exicosis, dehydration), general characterization.
14. definition of venous hyperemia, types.
15.General venous hyperemia as a morphologic manifestation of heart failure syndrome, definition of heart failure.
16.General acute venous hyperemia, causes, pathologic anatomy (macro- and microscopic signs).
17.General chronic venous hypertension, causes, pathologic anatomy (macroscopic and microscopic features).
18.Morphogenesis, morphologic signs of left ventricular heart failure.
19.Morphogenesis, morphologic signs of right ventricular heart failure.
20Chronic heart failure in the stage of cardiac decompensation, the concept of "induction" of organs and tissues, morphogenesis.
21.Pathologoanatomical changes of the heart and other organs and tissues in general chronic venous hemorrhage.
22. Morphogenesis, pathologic anatomy of "muscat" liver.

23.Morphogenesis, pathologic anatomy of "brown induration" of lungs.
24.Morphogenesis, pathologic anatomy of "cyanotic induction" of kidneys.
25.Disseminated intravascular coagulation syndrome (DIC), definition, etiology, morpho-pathogenesis, pathologic anatomy, outcome, significance.

No. 6

1. Theme: Inflammation.

2. Purpose: To learn to identify the causes, mechanisms of development and functional significance of exudative inflammation from other processes based on their morphological characterization.

3.Learning Objectives: Knowledge of the topic is necessary for mastering other topics of the general course of pathologic anatomy, as well as pathologic anatomy of diseases (private course).

In the study of clinical disciplines and in the practical work of the physician, knowledge of exudative inflammation is necessary for clinical and anatomical analysis.

4.The main questions of the topic are:

1.Definition, meaning, causes, mechanisms of inflammation.
2.Phases of inflammation (alteration, exudation, proliferation), morphology.
3.Types of exudative inflammation.
4.Macro and microscopic characterization of exudative inflammation.
5.Complications and outcomes of exudative inflammation. 5.
6. Etiology of productive inflammation. 5.
7.Pathogenesis of productive inflammation.
8.Types of productive inflammation.
9.Morphologic picture of productive inflammation.
10.Outcome and significance of productive inflammation for the organism.

5. Main forms /methods/techniques of teaching to achieve the final ROs for general pathology:
Discussion of the topic, microscopy, description of macrophotograph, description of microphotograph.
The evaluation criterion is shown in "Appendix No. 1"

6.Literature: "Appendix No. 2"

7.Control (Questions):

1.Inflammation, definition, general characterization, direction of action of inflammation.
2.Causes of inflammation.
3.Phases of inflammation, mediators, regulation of inflammation.
4. Immune inflammation, concept.
5. Exodus of inflammation, significance.
6.Classification of inflammation.
7. Exudative inflammation, definition, classification.
8.Serous inflammation, definition, characterization of serous exudate, examples, causes, outcome.
9.Fibrinous inflammation definition, types, characterization of fibrinous exudate, examples, causes, course, outcome.

10.Purulent inflammation definition, types, characterization of purulent exudate, examples, causes, course, outcome.
11.Putrefactive inflammation, characterization.
12.Hemorrhagic inflammation, characterization.
13.Catarrhal inflammation, characterization.
14.Mixed inflammation, characterization.
15.Proliferative (productive) inflammation, characterization, causes, course, morpho-pathogenesis.
16.Cellular composition characteristic of proliferative inflammation, types of giant multinucleated cells.
17.Types of proliferative inflammation (specific, non-specific).
18.Forms of proliferative inflammation.
19.Interstitial inflammation, characterization, localization, definition of cellular infiltrate, examples, outcome.
20.Granulomatous inflammation, characterization, localization, definition and morphogenesis of granuloma.
21.Types of granulomas.
22.Morphologic structure of granulomas in various diseases (nonspecific and specific).
23.Productive inflammation with formation of polyps and acute condylomas characteristic, localization, definition of polyp and acute condyloma, examples.
24.Productive inflammation around animal parasites and foreign bodies characterization, examples.
25.The outcome of granulomatous inflammation.

No. 7

1. Topic: Immunopathologic Processes.

2. Purpose: To learn to identify causes and mechanisms, to know the morphology of immunopathological process, and to distinguish immunopathological processes from other general pathological processes on the basis of their morphological characterization.

3. Learning objectives: Knowledge of the topic is necessary for mastering the general course and private course of pathological anatomy. It is necessary in the study of clinical disciplines and in the practical discipline of the physician for clinical and anatomical analysis.

4.Main questions of the topic:

1.Definition of immunopathologic processes, their classification.
2. Changes in the immunocompetent system under antigenic stimulation and immune deficiency.
3.Types, pathogenesis and morphology of hypersensitivity reactions.
4. Definition of autoimmunization and autoimmune diseases.
5.Types and morphologic characterization of autoimmune diseases.
6.Types, pathogenesis, morphology of immunodeficiency syndromes.

5.Main forms /methods/techniques of teaching to achieve the final ROs for general pathology: Discussion of topic, microscopy, description of macrophotograph, description of microphotograph. The evaluation criterion is shown in "Appendix No. 1"

6.Literature: "Appendix No. 2"

7.Control (Questions):

Questions:

1.general characteristics of immunopathological processes, types.
2.Pathology of the thymus. Congenital immunodeficiency syndromes (VIDS). Combined immunodeficiency syndromes, clinical and morphological characteristics.
3.VIDS associated with cellular immunity deficiency, clinical and morphological characteristics.
4.X-linked humoral immunity deficiency syndromes, clinical and morphological characterization.
5.VIDS associated with congenital deficiency of monocytes and neutrophils, clinical and morphological characterization.
6.Physiological (age-related) and accidental involution of the thymus, morphological characterization.
7.Aplasia, hypoplasia and dysplasia of the thymus, morphological characterization.
8.Thymomegaly, clinical and morphological characterization.
9.Hyperplasia of the thymus with lymphoid follicles, clinical and morphological characteristics.
10.Pathology of peripheral lymphoid tissue, causes, pathogenesis, morphological characterization of hyperplasia of spleen, lymph nodes.
11.Hereditary insufficiency of peripheral lymphoid tissue (spleen, lymph nodes), clinical and morphological characteristics.
12.Hypersensitivity reactions: mechanisms of development; hypersensitivity reactions of immediate, delayed type. Morphological characterization. Examples.
13.Transplant vs. host reaction, autoimmunization. Morphological characterization. Examples.

No. 8

1. Topic: Tumors

2.Purpose: To learn to identify different types of organ-nonspecific and organ-nonspecific epithelial tumors according to the principles of classification, as well as to distinguish them on the basis of morphological characteristics. To learn to identify macroscopic forms and histological types of gastric, lung, breast cancer, features of their growth and metastasis, as well as to distinguish them on the basis of morphological characteristics.

3.Learning objectives: Knowledge of the topic is necessary for mastering other topics of the general course, as well as private pathological anatomy. In the study of clinical disciplines and in the work of the doctor, knowledge of the topic is necessary for clinical and anatomical analysis.

4.The main questions of the topic are:

1.Definition of tumor.
2.Types of tumor atypism (anaplasia).
3.Principles of tumor classification.
4.Classification of epithelial tumors.
5.Macroscopic and microscopic characteristics of benign organ-nonspecific tumors from the covering and glandular epithelium.
6.Macroscopic and microscopic characteristics of malignant organ-specific tumors from the covering and glandular epithelium.
7.The nature of metastasis of malignant tumors from epithelium.
8.General characteristics, classification of exo- and endocrine tumors;

9. Morphological characteristics of benign organ-specific tumors of the thyroid gland;
10.Morphological characteristics of malignant organ-specific tumors of the prostate gland
11.Morphological characteristics of benign and malignant organ-specific tumors of endo-exocrine glands (pituitary, adrenal, ovarian),
12.Features of metastasis of malignant tumors of endocrine glands.
13.The concept of mesenchymal tissues.
14.2. General idea of mesenchymal tumors.
15.3.Concept of tumor, tumor growth.
16Distinctive features of pediatric tumors.
17.Pathogenesis, etiology of mesenchymal tumors of childhood.
18. Peculiarities of metastasis of mesenchymal tumors of childhood.
19.Principles of classification of pediatric tumors.
20.Definition of tumors of nervous tissue.
21.Classification of tumors of nervous tissue.
22.10.Macroscopic and microscopic characterization of benign and malignant tumors of nervous tissue.
23.Definition of melanoma.
24.Definition of melanin-forming tissue tumor.
25.13.Macro-microscopic characteristics of malignant tumor of melanin-forming tissue - melanoma, peculiarities of its metastasis.
26.Features of metastasis of tumors of the nervous system.
27.Classification of tumors of nervous and melanin-forming tissue.
28.Features of growth of melanin-forming tissue.

5. The main forms /methods/techniques of teaching to achieve the final ROs in general pathology: Discussion of the topic, microscopy, description of macrophotography, description of microphotography. The evaluation criterion is shown in "Appendix #1"

6.Literature: "Appendix No. 2"

7.Control (questions):

1.Definition, etiology and pathogenesis of tumors.
2. Properties of a tumor.
3. The structure of a tumor.
4. Microscopic features of a tumor.
5. Morphologic characterization of tissue and cellular atypism.
6. Tumor growth.
7. Morphogenesis and histogenesis of tumors.
8. Tumor progression and the body's immune response to tumor.
9. Classification of tumors.
10. Classification of tumors according to the TNM system.
11. Benign and malignant tumors.
12. Metastases, definition, types.
13. Tumor recurrence.

14. Effect of tumor on the body.
15. Secondary changes of tumors.
16. Epithelial organ-nonspecific tumors.
17. Tumors of exo- and endocrine glands.
18. Features of metastasis of epithelial tumors.
19. Mesenchymal tumors, general characteristics.
20. Benign tumors of connective, fat, muscle, bone, cartilage, blood, lymphatic vessels, serous membranes.
21. Malignant tumors of connective, fat, muscle, bone, cartilage, blood, lymphatic vessels, serous membranes.
22. Features of metastasis of malignant mesenchymal tumors.
23. Tumors of melanin-forming tissue.

Appendix No. 1.

Check-list. Criteria for evaluating the oral answer at the practical training session

№	Evaluation criterion	All listed correctly/100 points	Partially unspecified/50 points	Wrong answer/0 points
1.	Identification of the pathological process/disease			
2.	Classification of pathological process/disease			
3.	Etiology, pathogenesis, morphogenesis of pathological process/disease			
4.	Pathological anatomy of the pathological process/disease (characterization by organs and systems): macroscopic signs			

5.	Pathological anatomy of the pathological process/disease (characterization by organs and systems): microscopic signs			
5.	Complications, causes of death (in case of pathology of organs and systems), outcome			
6.	Total			

The maximum number of points is 100

Check-list. Criteria for evaluation of answers to the description of macroparamples at the practical training session and the SRSP

№	Evaluation criterion	Listed all correct/20 points for each question	Partially unspecified/10 points for each question	Wrong answer/0 points
1.	Name of body			
2.	Organ size			
3.	Surface: Condition of capsule or serous membrane, dullness, shine, overlap			
4.	Characteristics of the pathological focus: Localization, size, shape (if the ulcer is the condition of the bottom), color, consistency			
5.	Pathoanatomic diagnosis/conclusion			
6.	Total			

The maximum number of points is 100

The checklist. Criteria for evaluating responses to the description of micropreparations in a practical lesson and SRSP

№	Evaluation criteria/ assessment	Everything is listed correctly	Partially not specified	The answer is incorrect
1.	Name of the organ or tissue/20			

2.	Characteristics of pathological changes: localization, description/30			
3.	Coloring/20			
4.	Pathoanatomic diagnosis/conclusion/ 30			
5.	Total			

The maximum number of points is 100

Literature: "Appendix No. 2"

На русском языке

основная:

1 Тусупбекова, М. М. Морфологический атлас общепатологических процессов: учебное пособие / М. М. Тусупбекова. - Алматы : Эверо, 2016. - 164 с.

дополнительная:

1.Тусупбекова, М. М. Клиническая патоморфология: монография / М. М. Тусупбекова. - Алматы : Эверо, 2016. - 184 с.

2.Повзун, С. А. Патологическая анатомия в вопросах и ответах: учеб. пособие / С. А. Повзун. - 3-е изд., перераб. и доп. ; Рек. ГБОУ ВПО "Первый Мос. гос. мед. ун-т им. И. М. Сеченова". - М. : ГЭОТАР - Медиа, 2016. - 176 с. –

3.Патологическая анатомия. Руководство к практическим занятиям: учебное пособие / М-во образ. и науки РФ. Рек. ГБОУ ВПО "Первый МГМУ им. И. М. Сеченова" ; 4. Под. ред. О. В. Зайратьянца, Л. Б. Тарасовой. - 2-е изд., испр. и доп. - М. : ГЭОТАР - Медиа, 2015. - 696 с. : ил.

4.Тусупбекова, М. М. Морфологический атлас общепатологических процессов : атлас . - Алматы : Эверо, 2012.

6.5.Тусупбекова, М. М. Клиническая патоморфология : учебное пособие . - Алматы : Эверо, 2012.

6.Современные проблемы теоретической и клинической морфологии: материалы конф. 3 дек. 2009 / М-во здравоохранения РК; Каз. нац. мед. ун-т им. С. Д. Асфендиярова; Ассоциация Казахстана. - Алматы : Б. и., 2009. - 341 с.

электронные ресурсы:

1.Тусупбекова, М. М. Морфологический атлас общепатологических процессов [Электронный ресурс] : учебник / М. М. Тусупбекова. - Электрон. текстовые дан. (1.03Гб). - Алматы : Эпиграф, 2016. –

2. Патологическая анатомия [Электронный ресурс] : национальное рук. / гл. ред. М. А. Пальцева,. - М. : ГЭОТАР - Медиа, 2013. - 1264 с

3. Струков, А. И. Патологическая анатомия [Электронный ресурс] : учебник - М. : ГЭОТАР - Медиа, 2013

4. Струков, А. И. Патологическая анатомия [Электронный ресурс] : учебник . - 5-е изд. стер. - Электрон. текстовые дан. (51,9 МБ). - М. : Изд. группа "ГЭОТАР-Медиа", 2011. - . эл. опт. диск (CD-ROM).

5. Патологическая анатомия [Электронный ресурс] : атлас: учеб. пособие / О. В. Зайратьянц [и др.] ; под общ. ред. О. В. Зайратьянца. - Электрон. текстовые дан. (144 Мб). - М. : Изд. группа "ГЭОТАР-Медиа", 2010. - 472 с. эл. опт. диск (CD-ROM) .-

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https://zan.kz
7-Ғылыми электрондық кітапхана -
https://elibrary.ru/
8-«BooksMed» электронды кітапханасы -
http://www.booksmed.com
9-«Web of science» (Thomson Reuters) -
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10-«Science Direct» (Elsevier) -
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