# METHODOLOGICAL INSTRUCTIONS FOR INDEPENDENT WORK OF STUDENTS

**Discipline:** General pathology
**Course code** : OR 3214
**Name and code of the OP:** 6B10115- "Medicine"
**Volume of study hours/credits** : 180 /6
**Course and semester of study:** III course; V semester
**Volume of practical (seminar) classes :** 18 hours

**Shymkent, 2024**

Methodological guidelines for practical classes were developed in accordance with the working program of the discipline (syllabus) "General Pathology" and discussed at a meeting of the department

Protocol No. 11 «26» 05 2024.

Head of the Department _____ Sadykova A.Sh.

No. 1

**1.Topic:** Cell pathology

**2. Objective:** To know the cellular structure. To learn to define the nucleus, cytoplasm, cellular junctions, as well as pathological inclusions in the cytoplasm of the cell, to know the mechanisms of their development.

**3. Tasks:**

1. Know the cell structures
2. Know the pathological processes associated with the pathology of the nucleus, cytoplasm and other cellular structures.
3. Causes of cell pathology development
4. Pathology of the cell nucleus.
5. Pathology of the cytoplasm.
6. Pathology of cell junctions.

**4.Form of implementation/assessment** ( Description of macro- and micropreparations according to the scheme , preparation of an electronic version on the topic. Description of a microphotograph . Consultation on the most difficult issues of the curriculum, implementation of SRO assignments on emerging issues, conducting midterm control). The SRO check should be carried out during the SRO.

**5. Criteria for completing the SRO (requirements for completing the task).** Studying theoretical material, searching for websites to describe macro- and micropreparations, working with scientific literature. The assessment criterion is shown in the syllabus "Appendix No. 1, 2"

**6.Delivery dates:** 1-2 weeks

7. **Literature: "Appendix No. 3"**

8. **Control (questions):**

1. What is cellular structure? Give a definition.
2. Explain the pathological processes associated with nuclear pathology.
3. Explain the reasons for the development of cell pathology
4. What is cell nucleus pathology? Explain.
5. Morphological manifestation during tumor growth is the degree of intercellular adhesion.
6. Explain the pathology of cell junctions.

No. 2

**1. Topic:** Metabolic disorders

**2. Objective:** To learn to determine the causes, mechanisms of development and functional significance of parenchymal dystrophies from other pathological processes based on their morphological characteristics.

**3. Tasks:**

1.Determination of lipidosis.
2. Classification of parenchymal dystrophies depending on the type of impaired metabolism.
3.Types of parenchymatous dystrophies.
4. Macroscopic and microscopic characteristics of lipid dystrophies.
5. Causes and mechanisms of development of parenchymal dystrophies in various organs.

6. Functional significance and outcomes of parenchymal dystrophies.

**4.Form of implementation/assessment** ( Description of macro- and micropreparations according to the scheme , preparation of an electronic version on the topic. Description of a microphotograph . Consultation on the most difficult issues of the curriculum, implementation of SRO assignments on emerging issues, conducting midterm control). The SRO check should be carried out during the SRO.

**5. Criteria for completing the SRO (requirements for completing the task).** Studying theoretical material, searching for websites to describe macro- and micropreparations, working with scientific literature. The assessment criterion is shown in the syllabus "Appendix No. 1, 2"

**6. Submission deadline: 2 weeks**

7. **Literature: Literature: "Appendix No. 3".**

8. **Control (questions):**

1. Give a definition of parenchymatous dystrophy?
2. Name the types of parenchymatous dystrophies?
3. Name the types of protein dystrophy.
4. Name the types of fatty degeneration.
5. Name the types of carbohydrate dystrophy.

No. 3

**1. Topic: Mineral metabolism disorders**

**2. Objective:** To learn to determine the causes, mechanisms of development and functional significance mineral dystrophy from other pathological processes based on their morphological characteristics.

**3. Tasks:**

1. Give a definition of mineral dystrophy
2. Know the types of mineral dystrophy
3. Know the causes and mechanisms of development of nucleoprotein metabolism.
4. Know the types of mineral metabolism disorders and the mechanisms of their development.
5. Know the types of calcification and the mechanisms of their development.
6. To know the macroscopic and microscopic characteristics of calcifications and their significance for the body.
7. Know the mechanisms of stone formation, their types, and their importance for the body.

**4.Form of implementation/assessment** ( Description of macro- and micropreparations according to the scheme , preparation of an electronic version on the topic. Description of a microphotograph . Consultation on the most difficult issues of the curriculum, implementation of SRO assignments on emerging issues, conducting midterm control). The SRO check should be carried out during the SRO.

**5. Criteria for completing the SRO (requirements for completing the task).** Studying theoretical material, searching for websites to describe macro- and micropreparations, working with scientific literature. The assessment criterion is shown in the syllabus "Appendix No. 1, 2"

**6. Deadline: 4 weeks**

**7. Literature: “Appendix No. 3”.**

**8. Control (questions):**

1. Name the types of mineral metabolism disorders and the mechanisms of their development.
2. Name the types of calcification and the mechanisms of their development.

3. Explain the macroscopic and microscopic characteristics of calcifications and their significance for the body.
4. Explain the mechanisms of stone formation, their types, and their importance for the body.
5. Provide a description of macro-microelements.
6. Explain calcium metabolism disorders, types and mechanisms of this metabolism disorder.
7. Explain the macroscopic and microscopic characteristics of calcium metabolism disorders.
8. Explain the morphological characteristics of metabolic disorders of other macromicroelements.

No. 4

**1.Topic: Disorders of tissue fluid metabolism**

**Target:** Learn to determine the causes, mechanisms of development and functional significance of tissue fluid metabolism disorders .

**2. Tasks:**

1. Know the mechanism of development tissue fluid metabolism disorders .
2. Know the classification of edema.
3. Know the increase in tissue fluid content and the mechanisms of their development.
4. Know the decrease in tissue fluid content and the mechanisms of its development.

**4.Form of implementation/assessment** ( Description of macro- and micropreparations according to the scheme , preparation of an electronic version on the topic. Description of a microphotograph . Consultation on the most difficult issues of the curriculum, implementation of SRO assignments on emerging issues, conducting midterm control). The SRO check should be carried out during the SRO.

**5. Criteria for completing the SRO (requirements for completing the task).** Studying theoretical material, searching for websites to describe macro- and micropreparations, working with scientific literature. The assessment criterion is shown in the syllabus "Appendix No. 1, 2"

**6. Submission deadline: 5th week**

**7. Literature: “Appendix No. 3”.**

**8. Control (questions):**

1. What is edema? Give a definition.
2. Name their types?
3. What is ascites? Give a definition.
4. What are the types of tissue fluid metabolism disorders ?

No. 5

**1. Topic: Circulatory disorders**

**2. Objective:** To learn how to determine the causes, mechanisms of development and significance for the body of thrombosis, embolism, infarction, and also to diagnose these types of circulatory disorders based on their morphological characteristics.

**3. Tasks:**

1. Give a definition of thromboembolism
2. Know the causes of thrombus formation.
3. To know the macro- and microscopic characteristics of thromboembolism, its difference from postmortem clot, the meaning and outcomes of thromboembolism.
4. Know the types of thromboembolism and their importance in pathology 5. Know thromboembolic syndrome, its causes
6. Provide a definition of embolism.
7. Know the significance of embolism for the body.
8. Give a definition of a heart attack.
9. Know the causes of heart attack.
10. Know the morphological characteristics of infarction.
11. Know the meaning and outcomes of thrombosis, embolism, and infarction.

**4.Form of implementation/assessment** ( Description of macro- and micropreparations according to the scheme , preparation of an electronic version on the topic. Description of a microphotograph . Consultation on the most difficult issues of the curriculum, implementation of SRO assignments on emerging issues, conducting midterm control). The SRO check should be carried out during the SRO.

**5. Criteria for completing the SRO (requirements for completing the task).** Studying theoretical material, searching for websites to describe macro- and micropreparations, working with scientific literature. The assessment criterion is shown in the syllabus "Appendix No. 1, 2"

**6. Submission deadline: 6th week**

**7. Literature: “Appendix No. 3”.**

**8. Control (questions):**

1. What is thrombosis? Give a definition
2. Explain the mechanism of thrombosis development?
3. What are the reasons for this?
4. Explain the morphological characteristics of a thrombus?
5. What is the difference between a thrombus, a thromboembolus and a postmortem blood clot?
5. Explain the importance of thrombosis and its consequences for the body?
6. What is embolism? Give a definition.
7. Explain the importance of embolism for the body?
8. What is a heart attack? Give a definition.
9. Explain the reasons for the development of a heart attack?
10. Explain the morphological characteristics of a heart attack?
11. Explain the meaning and outcomes of thrombosis, embolism, infarction?

No. 6

1. **Topic: Inflammation**
2. **Objective:** To learn to determine the causes and mechanisms of development of immunopathological processes, as well as to distinguish immunopathological processes from other general pathological processes based on their morphological characteristics.

**3. Tasks:**

1. Know the definition of immunopathological processes and their classification.
2. To know the changes in the immunocompetent system during antigen stimulation and immune deficiency.
3. Know the types, pathogenesis and morphology of hypersensitivity reactions.
4. Know the definition of autoimmunization and autoimmune diseases.
5. Types and morphological characteristics of autoimmune diseases.
6. Types, pathogenesis, morphology of immunodeficiency syndromes.

**4.Form of implementation/assessment** ( Description of macro- and micropreparations according to the scheme , preparation of an electronic version on the topic. Description of a microphotograph . Consultation on the most difficult issues of the curriculum, implementation of SRO assignments on emerging issues, conducting midterm control). The SRO check should be carried out during the SRO.

**5. Criteria for completing the SRO (requirements for completing the task).** Studying theoretical material, searching for websites to describe macro- and micropreparations, working with scientific literature. The assessment criterion is shown in the syllabus "Appendix No. 1, 2"

**6. Submission deadline: 9th week**

**7. Literature: “Appendix No. 3”.**

**8. Control (questions):**

1. What is immunodeficiency syndrome? Give a definition.
2. Name the hypersensitivity reactions
3. Name the types, pathogenesis and morphology of hypersensitivity reactions?
3. What are the morphological characteristics of autoimmune diseases?
4. Name the types, pathogenesis, morphology of immunodeficiency syndrome?

No. 8

**Topic: Compensatory and adaptive processes. Regeneration .**

**1. Objective:** To teach how to determine the etiology, pathogenesis, classification and pathological anatomy of regeneration, as well as to distinguish them based on morphological characteristics.

**2. Tasks:**

1. Give an idea of the organization.
2 Know the mechanisms of organization development.
3. To give an understanding of wound healing according to the laws of reparative regeneration.
4. Know the types of wound healing.
5. Know the reasons and mechanisms of organization development.
6. Know the morphological manifestations of various types of wound healing.
7. Know the functional significance and its outcomes of the organization and healing of wounds.
8. 1. Definition of adaptation and adjustment processes.
9. 2. Distinguish between the essence of adaptation and adaptation.
10. 3. Name the stages of adaptation and adjustment, give their morphological characteristics. 4. Name and define different types of adaptive processes, explain the mechanism of their development.

11. 5. Distinguish between types of adaptive processes based on macro and microscopic, ultrastructural characteristics.
12. 6. Explain the functional significance of adaptive processes.

**4.Form of implementation/assessment** ( Description of macro- and micropreparations: description of macropreparations according to the scheme , preparation of an electronic version on the topic; description of microphotographs /checklists). The SRO check should be carried out during the SRO.

**5. Criteria for completing the SRO (requirements for completing the task).** Description of macro- and micropreparations according to the scheme , preparation of an electronic version on the topic. Description of a microphotograph . Consultation on the most difficult issues of the curriculum, completing SRO assignments on emerging issues, conducting midterm control. Study of theoretical material, search for websites for description of macro- and micropreparations, work with scientific literature. The assessment criterion is shown in the syllabus "Appendix No. 1, 2"

**6. Submission deadline: 10th week**

**7. Literature: “Appendix No. 3”.**

**8. Control (questions, tests, tasks, etc.):**

1. What is a device? Give a definition.
2. Name the stages of adaptation?
3. Name and define the different types of adaptive processes?
4. Explain the mechanism of adaptation development?
5. Explain the functional significance of adaptive processes?
6. What is regeneration? Give a definition.
7. Name the types of regeneration?
8. What is cellular regeneration?
9. What is intracellular regeneration?
10. Name the types of reparative regeneration?
11. What are the outcomes and meanings of regeneration?

No. 9

1. **Subject: Boundary control No. 2.**
2. **Objective:** To control the acquisition of knowledge on the topics covered, knowledge of macroscopic and microscopic manifestations of general pathological processes.
3. **Format of the event:** Description of macro- and micropreparations: description of macropreparations according to the scheme , preparation of an electronic version on the topic; description of microphotographs /checklists .
4. **Tasks on the topic:**

A. Questions on topics.

5. **Handout:**

1. Macropreparations

2. Micropreparations.
3. Tickets with questions on topics covered .
4. Microphotographs

**6. Literature: "Appendix No. 3".**

**7. Control (questions, list of macro and micro preparations):**

A) List of questions: (attached)
B) List of macropreparations
B) List of micropreparations

**List of questions**

1.What is venous congestion? Give a definition.
2.What is the name of the liver in chronic venous congestion?
3.When does general venous congestion develop?
4.When does local venous congestion develop?
5.What is inflammation? Give a definition.
6.Name the reasons. Inflammatory mediators?
7. Explain the morphology of the kinetics of the inflammatory reaction. Inflammation and immunity?
8. Explain the morphology of the alternative, exudative and proliferative phases of inflammation?
9.What is the classification of inflammation?
10. What are the age-related characteristics of inflammation?
11. Give a definition of exudative inflammation?
12. Name the types of exudative inflammation.
13.Name the reasons, development mechanism, morphological characteristics, outcomes of exudative inflammation.
14. Give a definition of productive inflammation?
15. Name the types of productive inflammation?
16. Name the reasons and mechanism of development of productive inflammation?
17. Explain the morphological characteristics of productive inflammation?
18. Name the complication of productive inflammation?
19What are the outcomes and significance of productive inflammation?
20. What are the causes of the formation of polyps and genital warts? 8. Explain the course of productive inflammation?
21.What is an immunopathological process **?** Give a definition.
22. Name the types of immunopathological process?
23. Explain the mechanism of their development?
24. Explain the morphological manifestations of the immunopathological process **.**
25.Functional significance and its outcomes
26.What is immunodeficiency syndrome? Give a definition.
27. Name the hypersensitivity reactions and their types, pathogenesis and morphology?
28. What are the morphological characteristics of autoimmune diseases?
29. Name the types, pathogenesis, and morphology of immunodeficiency syndrome?
30. What is a device? Give a definition.
31. Name the stages of adaptation and adjustment, give their morphological characteristics?
32. Give a definition of different types of adaptive processes?

33. Explain the mechanism of their development?
34. Distinguish between the types of adaptive processes based on macro and microscopic, ultrastructural characteristics
35. Explain the functional significance of adaptive processes.
36.What is an organization? Give a definition.
37. Explain the mechanisms of organization development?
38. Give the concept of wound healing according to the laws of reparative regeneration.
39. Name the types of wound healing?
40. Name the reasons and mechanisms of organization development?
41. Explain the morphological manifestations of different types of wound healing.
42. Explain the functional significance and its outcomes of the organization and healing of wounds
43.What are epithelial tumors? Give a definition.
44. Explain the morphological characteristics of benign organ-nonspecific tumors from the integumentary and glandular epithelium;
45. Explain the morphological characteristics of malignant organ-nonspecific tumors from the integumentary and glandular epithelium;
46. Name the features of metastasis of malignant tumors from the epithelium.
47. Describe the macroscopic and microscopic characteristics of benign and malignant organ-specific tumors of the endocrine and exocrine glands (pituitary gland, adrenal glands, pancreas, uterus).
48. Name the classification of stomach cancer, characteristics of its macroscopic forms and histological types.
49. Explain the metastasis of stomach cancer, complications, causes of death.
50. Explain the characteristics of precancerous lung diseases. Classification of lung cancer, characteristics of its macroscopic forms and histological types.
51. Explain lung cancer metastasis, complications, causes of death.
52.Characteristics of precancerous diseases of the mammary gland. Classification of mammary gland cancer, characteristics of its macroscopic forms and histological types.
53. Explain breast cancer metastasis, complications, causes of death.
54.What are mesenchymal tumors? Give a definition.
55. Give the concept of a tumor, tumor growth.
56. Name the distinctive features of childhood tumors.
57. Name the pathogenesis and etiology of mesenchymal tumors in childhood.
58. Name the features of metastasis of mesenchymal tumors in childhood.
59. Explain the principles of classification of childhood tumors.
60. Explain the complications and causes of death.
61. Give a definition of tumor-like formations from melanin-forming tissue.
62. What are the pigmented skin formations?
63. Give a description of melanoma?
64. Name benign and malignant brain tumors?
65. What is the clinical and morphological classification of melanoma?
66. Name the classification of tumors of nervous tissue.
67. Explain the macroscopic and microscopic characteristics of benign and malignant tumors of nervous tissue.
68. Name the macro-microscopic characteristics of a malignant tumor of melanin-forming tissue – melanoma, and the features of its metastasis.
69. What is anemia? Give a definition.

70. Name the types of anemia?
71. Name the complications of anemia?
72. Give a definition of leukemia?
73. Name the features of metastasis of tumors of the blood system.
74. Name the classification of tumors of the blood system.
75. Describe the macro and microscopic characteristics of tumors of the blood system.
76. Name the complications and causes of death of tumors and diseases of the blood system.

**List of macropreparations**

1. Chronic cardiac aneurysm. Spherical thrombus.
2. Brown induration of the lung
3. Occlusive red thrombus of the left coronary artery.
4. Fibrinous pericarditis (hairy heart)
5. Croupous pneumonia (stage of gray hepatization)
6. Milliary pulmonary tuberculosis
7. Ovarian atrophy
8. Breast tumor.
9. Stomach tumor
10. Kidney tumor
11. Cavernous hemangioma of the liver
12. Melanoma of the eye
13. Myeloleukemia of the spleen
14. Cardiac hypertrophy
15. Leukoplakia of the esophagus
16. Leiomyoma
17. Fibromyoma
18Lipoma

**List of micropreparations**

1. Mixed thrombus Aralas thrombus
2. Venous congestion of the liver (nutmeg liver)
3. Brown induration of the lung
4. Fibrinous pericarditis
5. Croupous pneumonia (stage of gray hepatization)
6. Glandular hyperplasia of the endometrial mucosa. Zhatyrdyn shyryshty kabatynyn bezdi hyperplasias
7. Scleroderma
8. Tuberculous granulomas in the lung. Description of tuberculosis granulomas.
9. Skin papilloma Teri papillomas
10. Atrophy of the pancreas in diabetes mellitus. Kant diabetes kezindegi ұуқы зінін atrophy
11. Skin papilloma. Teri papillomas

12. Adenocarcinoma of the stomach. Associated adenocarcinomas
13. Squamous cell keratinizing skin cancer. Zhalpak zhasushily tuleitin teri ragy
14. Lymphogranulomatosis
15. Spleen in myeloid leukemia. Myeloid leukemia kezindegi bauyr
16. Warty nevus. Suyel tarizdi nevi
17. Cavernous angioma of the liver
18. Leiomyoma
19. Chondroma
20. Intracanalicular fibroadenoma of the mammary gland

**Literature. Appendix No. 3**

**In Russian**

**main:**

1 Tusupbekova, M. M. Morphological atlas of general pathological processes: a tutorial / M. M. Tusupbekova. - Almaty: Evero, 2016. - 164 p.

**additional:**

1. Tusupbekova, M. M. Clinical pathomorphology: monograph / M. M. Tusupbekova. - Almaty: Evero, 2016. - 184 p.
2. Povzun, S. A. Pathological anatomy in questions and answers: textbook / S. A. Povzun. - 3rd ed., revised and enlarged; Rec. GBOU HPE "First Moscow State Medical University named after I. M. Sechenov". - M.: GEOTAR - Media, 2016. - 176 p. –
3. Pathological anatomy. Guide to practical classes: textbook / Ministry of Education and Science of the Russian Federation. Rec. GBOU HPE "First Moscow State Medical University named after I.M. Sechenov"; 4. Ed. by O. V. Zairatyants, L. B. Tarasova. - 2nd ed., corrected. and additional - Moscow: GEOTAR - Media, 2015. - 696 p.: ill.
4. Tusupbekova, M. M. Morphological atlas of general pathological processes: atlas. - Almaty: Evero, 2012.
6.5. Tusupbekova, M. M. Clinical pathomorphology: a tutorial. - Almaty: Evero, 2012.
6. Modern problems of theoretical and clinical morphology: conf. December 3, 2009 / Ministry of Health of the Republic of Kazakhstan; Kazakh National Medical University named after S. D. Asfendiyarov; Association of Kazakhstan. - Almaty: B. i., 2009. - 341 p.

**Electronic resources:**

1. Tusupbekova, M. M. Morphological atlas of general pathological processes [Electronic resource]: textbook / M. M. Tusupbekova. - Electronic text data. (1.03 Gb). - Almaty: Epigraph, 2016. –
2. Pathological anatomy [Electronic resource]: national leadership / editor-in-chief M. A. Paltseva,. - M.: GEOTAR - Media, 2013. - 1264 p.
3. Strukov, A. I. Pathological anatomy [Electronic resource]: textbook - M.: GEOTAR - Media, 2013
4. Strukov, A. I. Pathological anatomy [Electronic resource]: textbook. - 5th ed. erased - Electron. text data (51.9 MB). - M.: Publishing house. group "GEOTAR-Media", 2011. - . email wholesale disk (CD-ROM).

5. Pathological anatomy [Electronic resource]: atlas: textbook / O. V. Zairatyants [et al.]; edited by O. V. Zairatyants. - Electronic text data (144 MB). - M.: Publishing group "GEOTAR-Media", 2010. - 472 p. electronic optical disc (CD-ROM).-

Access link: http://www.studmedlib.ru , LOGIN ibragim123, PASSWORD Libukma123 (login and password are the same for everyone) and/or on the website of the library and information center of the academy lib.ukma.kz

**Link Title**

1-Kitaphan electrons
-http://lib.ukma.kz
2-Electronds catalog -http://10.10.202.52
-Ishki paidalanushylar ushin -http://89.218.155.74
- cheese paydalanushylar ushin
3-Republics of the region - http://rmebrk.kz/
4-“Student of Kenesshis” Medical Sciences ZOO Electrondy Kitapkhanasy - http://www.studmedlib.ru
5-“Paragraph” akparattyk zhuye “Medicine” more - https://online.zakon.kz/Medicine
6-“ZAN” құқықтық ақPARattyң electrons derekkozi -https://zan.kz
7-full electrons of kitaphana - https://elibrary.ru/
8-“BooksMed” electrons kitapkhanasy -http://www.booksmed.com
9-“Web of science” (Thomson Reuters) -http://apps.webofknowledge.com
10-Science Direct (Elsevier) -https://www.sciencedirect.com
11-"Scopus" (Elsevier) -www.scopus.com
12-PubMed -https://www.ncbi.nlm.nih.gov/pubmed

**In Kazakh language**

**main:**

1. Akhmetov, Zh. B. Pathological anatomy: okulyk / Zh. B. Akhmetov. - 4-bass, ondelgen zane tolyktyrylgan; ҚР Densaulyk saktau min. oku-adistemelik birlestiginde zhogary med.oku oryndaryny stud. Arnalgan. - M.: "Litterra", 2016. - 792 bet p.
2. Strukov, A. I. Pathological anatomy: okulyk /. - M.: GEOTAR - Media, 2015. - 984 bet. WITH
3. Pathology. Eki tomdyk. Volume 1: okulyk / Ed. bass. M. A. Paltsev, Kaz. tel. room S. A. Apbasova. - M.: GEOTAR - Media, 2015. - 536 bet p. : ill.
4. Akhmetov, Zh. B. Pathological anatomy: okulyk / Zh. B. Akhmetov. - ; KR densaulyk saktau ministerligi. - Almaty: Evero, 2014. - 700 bet. WITH
5. Strukov, A. I. Pathological anatomy: okulyk. - 5-bass, stereotype. - M.: GEOTAR-Media, 2013. - 984 bet. email wholesale disk (CD-ROM)
6. Strukov, A. I. Pathological anatomy: okulyk - M.: GEOTAR-Media, 2013.
7. Kismanova, G.N. - Almaty: Evero, 2010
8. Strukov, A. I. Pathological anatomy (Zhalpy bolimi): okulyk. - 2 bassy. – Aktobe: Housing Society "M. Style", 2010
9. Strukov, A. I. Pathological anatomy (Zheke aurular bolimi. II bolim. 1st kit) : okulyk. – Aktobe: ZHSS "M Style", 2010

10. Strukov, A. I. Pathological anatomy (Zheke aurular bolimi. II bolim 2nd kitap) : okulyk . - 2 bassy. – Aktobe: Housing Society "M. Style", 2010..
11. Akhmetov Zh. B. Pathological anatomy. 1st kit: oku kurals. - 2-bass, kayta ond.. - Almaty, 2009.
12. Akhmetov Zh. B. Pathological anatomy. 2nd kitap: oku kurals. - 2-bass, kayta ond.. - Almaty, 2009.

**additional:**

4. Pathological anatomy atlas: oku kuraly = Pathological anatomy: atlas: textbook. manual - M.: GEOTAR - Media, 2014. - 1128 bet

**In English**

**main:**

1. Norris , Tommy L .
Porth's Pathophysiology: Concepts of Altered Health States [Text]: textbook / TL Norris. - 10th ed. - [B. m.]: Wolters Kluwer, 2019. - 1573 rub.
Translation of the title: Porth 's Pathophysiology : Concepts of Altered Health States
2. Klatt, Edward C.
Robbins and Cotran. Review of Pathology [Text]: textbook / Edward C. Klatt, V. Kumar. - 4th ed. - [S. l.]: Elsevier Saunders, 2015. - 492 p.
Translation of the title: Robbins and Cotran. Review of pathology
3. Kumar, V.
Robbins Basic Pathology [Text]: textbook / V. Kumar, AK Abbas, JC Aster. - 10th ed. - [S. l.]: Elsevier, 2018. - 935 p.
Translation of the title: Robbins's Basic Pathology
4. Kumar, V.
Robbins and Cotran. Pathologic Basis of Disease [Text]: textbook / V. Kumar, Abyl K. Abbas, Jon C. Aster. - 9th ed. - [B. m.]: Elsevier/Saunders, 2015. - 1391 p.
Translation of the title: Robbins and Cotran. Pathological Basis of Disease