



APPROVED

EMD decision

" 12 " 10 2021

Protocol No. 5

Chairman of the EMC, Vice-Rector,
candidate of pedagogical sciences,
associate professor Apezova D.U.

SYLLABUS by discipline

B.3.1.8. PATHOLOGICAL PHYSIOLOGY

For students of the educational program, of higher professional education in the specialty 560001 "General Medicine" (5-year education) in the specialty "Doctor"

Type of study work	Всего часов
Course	2
Semester	3
Number of weeks	18
Credits	4
<i>The total complexity of the discipline</i>	120
Classroom/practical studies (PS)	24/48
Student Independent Work (SIW)	48
Forms of control	
current control	Testing, oral questioning, written test
Frontier control	Testing
Midterm	Testing
Final control	exam
Semester rating by discipline:	Point-rating system

Information about the teacher of the academic discipline

Full Name	Otorbaev Chagatai Kaipovich
Post	Teacher
Academic degree	-
Academic title	-
Email address	
Location of the department (address)	KR, Bishkek, st. Shabdan Baatyr 128, floor 2
Telephone	0554148xxx
Consultation hours	11.00-13.30

Characteristics of the academic discipline

The purpose of studying the discipline. The general goal of teaching pathophysiology, clinical pathophysiology is to form the student's scientific knowledge about the general patterns and specific mechanisms of the occurrence, development and outcomes of pathological processes, reactions, individual diseases and disease states, about the principles of their detection, therapy and prevention. The objectives of this discipline are: teaching students the basic concepts and modern concepts of general nosology; teaching students the etiology, pathogenesis, principles of detection, treatment and prevention

of the most socially significant diseases and pathological processes, taking into account age-related characteristics; teaching students the general patterns and mechanisms of occurrence, development and outcomes of pathological processes, conditions, reactions and diseases; teaching students to conduct pathophysiological analysis of data on pathological syndromes, pathological processes, forms of pathology and individual diseases; acquisition by students of knowledge and skills to formulate principles (algorithms, strategy) and methods for detecting, treating and preventing pathological processes, conditions, reactions and diseases; acquisition by students of knowledge and skills to analyze scientific literature and official statistical reviews, prepare reviews of scientific literature or abstracts on modern medical scientific problems; the acquisition by students of knowledge and skills to conduct statistical analysis and prepare reports on the study; teaching students to comply with the basic requirements of information security; acquisition by students of the skills of the methodological, methodological and practical base of clinical thinking and effective professional action of a doctor; the acquisition by students of knowledge and skills to solve individual research and scientific-applied tasks in the field of health care to study the etiology and pathogenesis, diagnosis, treatment, rehabilitation and prevention of human diseases

Discipline Prerequisites:

- Latin language
- Biology with elements of ecology

Postrequisites of the discipline:

- Basic pharmacology
- Proped therapy
- Endocrinology
- Hematology
- Occupational diseases
- Hospital therapy
- Outpatient pediatrics
- Fundamentals of Clinical Examinations in Internal Medicine
- Fundamentals of Clinical Examinations in Pediatrics

Learning outcomes of the discipline according to the RO GPP

Studying the discipline of pathological physiology will contribute to the achievement of learning outcomes (LE) of the BEP:

PO-1 - Describe and distinguish between the normal structure (morphology) and function (physiology) of the body as a whole, organs and systems, as well as pathological changes that are observed in various diseases and conditions.

Within the framework of this discipline, it is expected to achieve the following learning outcomes of the discipline, which are implemented as part of the achievement of competencies:

PC-4 - able and ready to conduct a pathophysiological analysis of clinical syndromes, substantiate pathogenetically justified methods (principles) of diagnosis, treatment, rehabilitation and prevention among the population, taking into account age and sex groups;

PC-14 - capable and ready to make a diagnosis based on the results of biochemical and clinical studies, taking into account the course of pathology in organs, systems and in general;

Content of the discipline

№№	Name of topics
1.	“General nosology, pathogenic influence of environmental factors on the body. cell pathophysiology. The role of reactivity, resistance and heredity in the development of pathology. Pathophysiology of Allergy.
2.	Subject and tasks of pathophysiology. Basic concepts of nosology. General etiology and pathogenesis, their relationship History of domestic and world pathophysiology. The role of reactivity and resistance in the development of pathology. Pathophysiology of allergy. (Lek)

3.	Introduction to the subject. Subject, tasks, methods and sections of pathological physiology. Basic concepts of nosology. General etiology and pathogenesis, their relationship. Modeling of diseases.
4.	Etiology and pathogenesis of the damaging effect of environmental factors on the body and their consequences: overheating, hypothermia, burns, burn disease, kinetosis, the effect of electric current on the body.
5.	Pathophysiology of typical cell damage. Cell adaptation to injury. Mechanisms of apoptosis and necrosis.
6.	Violation of specific and nonspecific reactivity and resistance of the body. Pathology of phagocytosis: causes and consequences. The role of reactivity and resistance of the organism in the development of pathology.
7.	Pathophysiology of allergy. Classification of allergic reactions. Stages of allergic reactions, their pathophysiological characteristics. Etiopathogenesis and clinical manifestations of allergic reactions. Etiology and pathogenesis of hereditary and congenital diseases.
8.	Etiology and pathogenesis of the damaging effect of environmental factors on the body and their consequences: overheating, hypothermia, burns, burn disease, kinetosis, the effect of electric current on the body.
9.	Pathophysiology of typical cell damage. Cell adaptation to injury. Mechanisms of apoptosis and necrosis.
10.	Violation of specific and nonspecific reactivity and resistance of the body. Pathology of phagocytosis: causes and consequences. The role of reactivity and resistance of the organism in the development of pathology.
11.	Pathophysiology of allergy. Classification of allergic reactions. Stages of allergic reactions, their pathophysiological characteristics. Etiopathogenesis and clinical manifestations of allergic diseases.
12.	Etiology and pathogenesis of hereditary and congenital diseases.
13.	General etiology and pathogenesis of typical forms of cell damage.
14.	Section 2. "Typical pathological processes - typical disorders of local circulation, inflammation, fever and infectious process."
15.	Inflammation. The difference between acute and chronic inflammation. exudate and transudate.
16.	Disorders of local circulation: - arterial and venous hyperemia, ischemia, stasis. Causes, mechanisms of development and outcomes of thrombosis and embolism.
17.	Etiology and pathogenesis of inflammation. Vascular reactions in the focus of inflammation. Local and general signs of inflammation. - Inflammation, mechanisms of exudation. Types of exudate. Pathogenetic features of acute and chronic inflammation.
18.	Etiology and pathogenesis of inflammation. Vascular reactions in the focus of inflammation. Local and general signs of inflammation.
19.	Inflammation, mechanisms of exudation. Types of exudate. Pathogenetic features of acute and chronic inflammation.
20.	Etiology and pathogenesis of fever.
21.	Pathophysiology of the infectious process. Pathophysiology of sepsis.
22.	Etiology and pathogenesis of fever. Pathophysiology of the infectious process. Pathophysiology of sepsis.
23.	Causes, mechanisms of development and outcomes of thrombosis and embolism.
24.	Section 3. "Typical forms of pathology of the external respiratory system and the cardiovascular system"
25.	Pathophysiology of insufficiency of the external respiratory system (SVD). Obstructive and restrictive forms of insufficiency of external respiration and mechanisms of their development. Pathophysiology of the coronary insufficiency. Types, causes and mechanisms of development of coronary insufficiency. Pathogenesis and main clinical manifestations of myocardial infarction and cardiogenic shock.
26.	Pathophysiology of cardiac arrhythmias. Pathophysiology of chronic heart failure. Pathogenesis of the main clinical manifestations of chronic heart failure (CHF). Pathophysiology of arterial hypo- and hypertension. Etiology and pathogenesis of symptomatic arterial hypertension and essential hypertension (AH).
27.	Pathophysiology of rhythm and conduction disorders of the heart. Pathophysiology of coronary insufficiency. The pathogenesis of cardiogenic shock.

28.	Pathophysiology of insufficiency of the external respiratory system. Pathophysiology of rhythm and conduction disorders of the heart. Pathophysiology of coronary insufficiency. The pathogenesis of cardiogenic shock.
29.	Pathophysiology of coronary insufficiency. The pathogenesis of cardiogenic shock.
30.	Pathophysiology of insufficiency of the external respiratory system.
31.	Typical disorders of vascular tone: arterial hypo - and hypertension.
32.	Pathophysiology of chronic heart failure (CHF).
33.	Typical disorders of vascular tone: arterial hypo - and hypertension.
34.	"Typical metabolic disorders - basic, protein, carbohydrate, fat, acid-base state and water-salt metabolism. Pathophysiology of tumor growth and hypoxic conditions".
35.	Typical disorders of protein metabolism. Features of the occurrence and manifestation of violations of protein metabolism. Protein-calorie deficiency. Starvation. Typical disorders of carbohydrate metabolism. Etiology and pathogenesis of diabetes mellitus type I and II.
36.	Typical forms of violation of the basic and protein metabolism. Starvation. Protein-calorie deficiency. - Typical forms of carbohydrate metabolism disorders. Etiopathogenesis of diabetes mellitus.
37.	Typical disorders of lipid metabolism. Etiology and pathogenesis of alimentary obesity and atherosclerosis. Typical forms of violation of the acid-base state and water-salt metabolism.
38.	Pathophysiology of tumor growth. Features of tumor growth in children. Pathophysiology of hypoxic conditions. Altitude and mountain sickness.
39.	Typical forms of violation of the basic and protein metabolism. Starvation. Protein-calorie deficiency.
40.	Typical forms of carbohydrate metabolism disorders. Etiopathogenesis of diabetes mellitus.
41.	Typical disorders of lipid metabolism. Etiology and pathogenesis of alimentary obesity and atherosclerosis. Typical forms of violation of the acid-base state and water-salt metabolism.
42.	Pathophysiology of tumor growth. - Pathophysiology of hypoxic conditions. Altitude and mountain sickness.
43.	"Typical forms of pathology of the blood system"
44.	Pathophysiology of anemic syndrome. Etiology and pathogenesis of iron deficiency, B12 - and folic acid deficiency anemia. Main clinical manifestations and mechanisms of their development.
45.	Changes in the total amount of blood: normo-; hypo- and hypervolemia, their types, causes and mechanisms of development. Etiopathogenesis of posthemorrhagic anemia.
46.	Pathophysiology of the leukocyte system. Etiopathogenesis of leukocytosis, leukopenia and leukemoid reaction. Agranulocytosis. - Etiology and pathogenesis of leukemia. Etiology and pathogenesis of iron deficiency, vit B12-folic acid deficiency and hemolytic anemia.
47.	Typical forms of pathology and reactive changes in the total volume, ratio of plasma and blood cells. Etiology and pathogenesis of posthemorrhagic and hemolytic anemias. Compensation mechanisms for acute blood loss.
48.	Changes in the total amount of blood: normo-; hypo- and hypervolemia, their types, causes and mechanisms of development. Etiopathogenesis of posthemorrhagic anemia.
49.	Etiology and pathogenesis of iron deficiency, vit B12-folic acid deficiency and hemolytic anemia.
50.	Pathophysiology of the leukocyte system. Etiopathogenesis of leukocytosis, leukopenia and leukemoid reaction. Agranulocytosis.
51.	"Typical forms of pathology of the liver and gastrointestinal tract"
52.	Pathophysiology of the liver. Jaundice. Causes and signs of liver failure. The pathogenesis of hepatic coma. Features of liver pathology in children.
53.	Typical forms of pathology of the gastrointestinal tract. Etiology and pathogenesis of peptic ulcer of the stomach of the duodenum.
54.	Pathophysiology of the liver. Jaundice, types. Etiology and pathogenesis. Liver failure. Signs of consequences. Mechanisms of development of portal hypertension and hepatic coma and its main manifestations. Typical forms of pathology of the gastrointestinal tract. Etiology and pathogenesis of peptic ulcer of the stomach of the duodenum.
55.	"Typical forms of kidney pathology"

56.	Pathophysiology. kidneys. Pathophysiological characteristics of chronic diffuse glomerulonephritis (CDG) and pyelonephritis. Pathophysiology of renal failure: acute renal failure and chronic renal failure. Etiology and pathogenesis of uremia and uremic coma.
57.	Pathophysiology of the kidneys. Mechanisms violation of the basic processes of formation and excretion of urine. Changes in the amount and composition of urine. Nephrotic and nephritic syndrome. Etiology and pathogenesis of acute and chronic diffuse glomerulonephritis. Pyelonephritis.
58.	Pathophysiology of renal failure. The etiology and pathogen of acute renal failure (ARF) (and chronic renal failure (CRF) (Pathogeny of uremia and uremic coma.
59.	Pathophysiology of the kidneys. Mechanisms violation of the basic processes of formation and excretion of urine. Changes in the amount and composition of urine. Nephrotic and nephritic syndrome. Etiology and pathogenesis of acute and chronic diffuse glomerulonephritis. Pyelonephritis.
60.	Pathophysiology of renal failure. The etiology and pathogen of acute renal failure (ARF) (and chronic renal failure (CRF) (Pathogeny of uremia and uremic coma.
61.	«Типовые формы патологии эндокринной и нервной систем»
62.	General etiology and pathogenesis of endocrinopathies. Pathophysiological characteristics of hypo- and hyperfunction of the hypothalamic-pituitary system.
63.	Pathophysiological characteristics of hypo- and hyperfunction of the thyroid gland, adrenal glands and gonads. Endemic goiter, etiology and pathogenesis. Pathophysiology of the nervous system: general etiology and pathogenesis of disorders of the nervous system. Violations of the locomotor, sensory and trophic functions of the nervous system. Pathophysiology of pain. Pathophysiology of higher nervous activity. Neuroses, their types and characteristics.
64.	General etiology and pathogenesis of endocrinopathies. Pathophysiological characteristics of hypo- and hyperfunction of the hypothalamic-pituitary system.
65.	Pathophysiological characteristics of hypo- and hyperfunction of the thyroid gland. Pathophysiological characteristics of hypo- and hyperfunction of the adrenal glands and gonads.
66.	Pathophysiology of the nervous system. General etiology and pathogenesis of structural functional disorders of the nervous system. Typical violation of the sensory, locomotor trophic function of the nervous system. Pathophysiology of pain.
67.	Pathophysiological characteristics of hypo- and hyperfunction of the thyroid gland. Pathophysiological characteristics of hypo- and hyperfunction of the adrenal glands and gonads.
68.	Pathophysiology of the nervous system. General etiology and pathogenesis of structural functional disorders of the nervous system. Typical violation of the sensory, locomotor trophic function of the nervous system. Pathophysiology of pain. Pathophysiology of VND. neuroses. Types and their characteristics. Etiology and pathogenesis.
69.	General etiology and pathogenesis of endocrinopathies. Pathophysiological characteristics of hypo- and hyperfunction of the hypothalamic-pituitary system. Pathophysiology of VND. neuroses. Types and their characteristics. Etiology and pathogenesis.

List of main and additional literature:

Main literature:

1. "Lectures on pathophysiology" Electronic resource. Ed. G.V. Order Ed. "GEOTAR-Media", 2019
2. Pathophysiology. Ed. A.I. Volozhina and G.V. Poryadina, Academy, 2013, volume 1-3

Additional literature:

1. Pathophysiology Course of lectures/ Edited by G.V. Poryadin, J.M. Salmasi Medical Information Agency, 2020
2. Pathologic basis of disease Kumar V. Robbins and Cotran. Independence Mall (Phil.): Saunders: Elsevier, 2005.

Internet resources:

- <http://www.edu.ru>
<http://www.medicina.ru>
<http://marc.rsmu.ru:8020/marcweb2/>

Monitoring and evaluation of learning outcomes

The content of the rating system for assessing student performance

The rating assessment of students' knowledge in each academic discipline, regardless of its total labor intensity, is determined on a 100 (one hundred) - point scale and includes current, boundary, intermediate and final control.

The distribution of rating scores between types of control is established in the following ratio (according to the table of the score-rating system of assessments):

Form of control				
current (CC)*	boundary control (BC)**	mid-term exams (MC)***	Final /exam (FE)	Discipline Rating (RD)
0-100 points	0-100 points	0-100 points	0-100 points	0-100 points, with the translation of points into a letter designation

Note:

* $TK(middle) = \frac{\sum_1^n \times point}{\sum_1^n}$, where n is the number of types of classroom and extracurricular work of students in the discipline;

** $PK(middle) = \frac{\sum_1^n credit \times point}{\sum_1^n credits}$, where n is the number of modules (credits) in the discipline;

*** $ПК(middle) = \frac{\sum_1^n \times point}{\sum_1^n}$, where n is the number of intermediate controls (2 controls per semester: in the middle and at the end of the semester) by discipline;

****ИК – examination conducted at the end of the study of the discipline

;

*****РД = $\frac{TK_{ср} + PK_{ср} + ПК_{ср} + ИК}{4}$, the final rating of the results of all types of control at the end of the discipline;

GPA = $\frac{\sum_1^n \times балл}{\sum_1^n}$ where, n is the number of disciplines in the semester (for the past period of study).

A student who has not passed the current, boundary and intermediate controls to the final control (exam) is not allowed.

The current control is carried out during the period of classroom and independent work of the student on time according to the schedule, at the end of the study of the discipline, the average score of the current control (CC) is calculated. *Forms of current control can be:*

- testing (written or computerized);
- performance of individual homework assignments, abstracts and essays;
- student's work in practical (seminar) classes;
- various types of colloquia (oral, written, combined, express, etc.);
- control of performance and verification of reporting on laboratory work;
- visiting lectures and practical (seminar, laboratory) classes;
- Incentive rating (up to 10 points).

Other forms of current monitoring of results are also possible, which are determined by the teachers of the department and recorded in the work program of the discipline.

The frontier control is carried out in order to determine the results of the student's development of one credit (module) as a whole. *Frontier control* should be carried out only in writing, at the end of the study of the discipline, the average score of boundary control (BC) is calculated. *As forms of frontier control of the training module, you can use:*

- testing (including computer testing);
- interview with written fixation of students' answers;
- test.

Other forms of intermediate control of results are also possible.

Intermediate control (mid-term exams) is carried out in order to check the completeness of knowledge and skills in the material in the middle and end of the semester (2 times per semester) of studying the discipline, by the end of the study of the discipline, the average score of intermediate control (PCsr) is calculated, *forms of intermediate control (mid-term exams) can be:*

- testing (including computer testing);
- interview with written fixation of students' answers;
- test.

Other forms of intermediate control of results are also possible.

The final control is carried out during the session, by conducting an exam, it can be carried out in the following forms:

- testing (including computer testing);
- written exam (ticketing system).

Correspondence of the point-rating system of assessments used by the institute and the assessments of the European system for the transfer of credit units, labor intensity (ECTS)

Grade						Criterion
System of letters	digital system	Traditional system	Points (%)	Scored points (max - 100)	Evaluation by discipline without an exam	
A	4	5	95-100	95-100	Credited/ passed	"Excellent" - deserves a student who has shown a deep, systematic and comprehensive knowledge of the educational material, who freely performs practical tasks, who has mastered the recommended basic and additional literature on the discipline
A-	3,67		90-94	90-94		"Excellent" - deserves a student who has shown a deep, systematic and comprehensive knowledge of the educational material, who freely performs practical tasks, who has mastered the recommended basic literature on the discipline, but is not familiar with additional literature
B+	3,33	4	85-89	70-89		"Good" - exhibited to a student who has shown a systematic and comprehensive knowledge of the educational material, able to independently replenish and update this knowledge in the course of training, performing practical tasks, familiar with the main literature on the discipline
B	3,0		80-84			"Good" is given to a student who has shown a systematic and comprehensive knowledge of the educational material, who is able to independently replenish this knowledge in the course of training, performing practical tasks, but not fully familiar with the main literature on the discipline
B-	2,67		75-79			"Good" - is given to a student who has shown the systematic nature of knowledge in the discipline, who is able to independently replenish this knowledge in the course of training, performing practical tasks, but not fully familiar with the main literature on the discipline
C+	2,33	3	70-74	50-69		"Satisfactory" - is given to a student who does not have a systematic nature of knowledge in the discipline, who is not capable of independently replenishing and updating knowledge in the course of further education, performing practical tasks with errors
C	2,0		65-69			"Satisfactory" - is given to a student who made mistakes in completing assignments, but who has the necessary knowledge to eliminate them under the guidance of a teacher
C-	1,67		60-64			"Satisfactory" - is set to a student who made errors in the performance of tasks, but who has the possible knowledge to eliminate them under the guidance of a teacher
D+	1,33		55-59			"Satisfactory" - is set to a student who made errors in the performance of tasks, who does not have the necessary knowledge to eliminate them
D-	1,0		50-54			"Satisfactory" - is given to a student who has made significant errors in the performance of tasks, who does not have the necessary knowledge to eliminate them
FX	0,5	2	25-49	Less of 50	not credited/not passed	"Unsatisfactory" - is set to a student who has not completed the task, does not have the necessary knowledge to eliminate them
F	0		0-24			"Unsatisfactory" - is set to a student who has not completed the task, does not have the necessary knowledge to eliminate them, even under the guidance of a teacher

Academic achievement requirements:

Attendance by students of all classroom classes without delay is mandatory.

In case of absence, classes are worked out in the order established by the dean's office.

If there are three passes, the teacher has the right not to allow the student to attend classes until the issue is administratively resolved.

If the absence of classes is more than 20.0% of the total number of classes, the student automatically enters the summer semester.

Note to the student:

- ✓ regularly review lecture material;
- ✓ Do not be late and do not miss classes;
- ✓ work off missed classes if you have permission from the dean's office;
- ✓ Actively participate in the classroom (individually and in groups;)
- ✓ timely and fully complete homework assignments;
- ✓ submit all assignments within the time specified by the teacher;
- ✓ independently study the material in the library and at home;
- ✓ timely and accurately fulfill the tasks of the teacher, individual tasks for the IWS to achieve learning outcomes;
- ✓ to master the basic and additional literature necessary for the study of the discipline;
- ✓ performing tasks, the student should not copy or reproduce the work of other students, scientists, practitioners, plagiarism;
- ✓ develop their intellectual and oratory skills;

In case of non-compliance with the requirements of the Memo, the student will be penalized in the form of deducting points (one point for each violated item).

If the requirements of the Memo are fully met, the student is encouraged in the form of an additional 10 points to the final control in the discipline.

Academic Integrity, Conduct and Ethics Policy:

- turn off your cell phone during class;
- Be polite;
- respect other people's opinions;
- formulate objections in the correct form;
- do not shout or raise your voice in the audience;
- independently complete all semester assignments;
- Eliminate plagiarism from your practice;

Methodical instructions.

It is recommended to organize the time required to study the discipline as follows:

When preparing for a practical lesson, you must first read the abstract with the teacher's explanations.

When performing exercises, you must first understand what you want to do in the exercise, then proceed to its implementation.

Literature work. The theoretical material of the course becomes more understandable when books are studied in addition to the abstract. After studying the main topic, it is recommended to perform several exercises.

Preparation for boundary and intermediate controls. In preparation for the boundary and intermediate control, it is necessary to study the theory: the definitions of all concepts before understanding the material and independently do several exercises.

Independent work of students is organized on all studied topics of each section. Independent work is carried out in the form of:

- work in Internet sites;
- work with basic and additional literature;
- fulfillment of written assignments;
- preparation of reports, abstracts, tables and posters on