

**MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS
EDUCATIONAL INSTITUTION
BELARUSIAN STATE MEDICAL UNIVERSITY**

**Контрольный
экземпляр**

APPROVED

Acting First Vice-Rector, Professor

V.V.Roudenok

04.10.2018

Reg. # UD-*1639/1819* /edu.

CLINICAL PATHOLOGICAL PHYSIOLOGY

**Curriculum of higher educational institution
in the educational discipline for the specialty:**

1-79 01 01 “General Medicine”

Minsk, BSMU 2018

Curriculum is based on the standard educational program "Clinical Pathological Physiology", approved 03.10.18, registration # UD-L. 639/tp

COMPILERS:

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RECOMMENDED FOR APPROVAL:

1-st Department of Internal Diseases of the Educational Institution "Belarusian State Medical University"

(protocol # 10 of 29.05.2018);

by the Methodological Commission of Therapeutic Disciplines of the Educational Institution "Belarusian State Medical University"

(protocol #218/1 of 04.06.2018)

EXPLANATORY NOTE

Clinical Pathological Physiology is an academic discipline that contains systematized scientific knowledge about the specific mechanisms of the genesis and development of the most common socially significant diseases to select rational pathophysiologically based approaches to their diagnosis and treatment.

The aim of teaching and learning of the educational discipline "Clinical Pathological Physiology" is the formation of students' clinical thinking as a result of profound study of Pathophysiology and clinical medicine.

The task of the discipline is to acquire academic competencies by the students, based on the knowledge of:

- mechanisms of occurrence, development and outcomes of pathological processes in the most common diseases;
- compensation mechanisms of structural and functional disorders of organs and systems;
- principles of making diagnosis;
- pathophysiologically grounded principles of diagnosis, treatment and prevention of socially significant diseases.

Teaching and successful learning of the discipline "Clinical Pathological Physiology" is carried out on the basis of the knowledge and skills acquired by the students in the following sections of academic disciplines:

Normal Anatomy. The structure of the human body, its organs and systems. Individual, gender and age characteristics of the organism. Topography of the internal organs and their anatomical and topographical relations. Projection of the internal organs on the body surface. Radiological anatomy. Impact of labor, physical activity, social conditions and environmental factors on the development and structure of the organism.

Medical Biology and General Genetics. Heredity and variability, inheritance types, genotype and phenotype.

Normal Physiology. Physiological basis of the cells, organs, tissues and the whole organism activity in terms of its interaction with the environment. Physiological functions of the body on different levels of organization, mechanisms of their regulation and self-regulation. The main indicators of the normal physiological functions and its systems. Physiological basis of a healthy lifestyle.

Histology, Cytology, Embryology. Principles of organization and histological structure of organs and systems, tissue and cellular composition of the structural and functional units, the ratio of various tissues in the composition of organs. Common patterns of tissue and organ reactions to external influences, characteristics of their radiosensitivity and radioresistance. Structural basis of homeostasis.

Microbiology, Virology, Immunology. Etiology, pathogenesis, immunity and microbiology diagnosis, basics of specific therapy and prevention of bacterial, viral, fungal and protozoan diseases. Characteristics of opportunistic pathogens. Opportunistic infections and their diagnosis. Nosocomial infections.

Pharmacology. Principles of pharmacokinetics and pharmacodynamics of drugs. Factors determining therapeutic efficacy, side effects, toxicity and allergenicity of medication. Basic agents of medication in various pathological processes and the most common diseases.

General and Military Hygiene. The effects of the environment on the human health. Hygienic value of air, soil, water and solar radiation. Diseases associated with the adverse effect of climate and social factors. Hygienic aspects of nutrition. Organization and implementation of preventive measures. Personal hygiene, hygienic requirements for healthy lifestyle, work, leisure. Ecology and environmental management.

Pathological Physiology. General theory of diseases. Concepts and pathology categories. Classification and nomenclature of diseases. Social aspects of diseases development. Characteristics of the main forms of disease-causing factors. The role of specific causes and conditions in the development of the disease. Common pathogenesis. Mechanisms of resistance to the effect of pathogenic factors. The processes of recovery and death. Typical pathological processes. Common patterns of genesis and development of inflammation mechanisms, tumor growth, fever, hypoxia, typical metabolic impairment, starvation and neurogenic dystrophies. Principles of structural and functional disorders correction in the typical pathological processes. Common patterns of various organs and systems pathology. Compensation mechanisms of functional and structural pathology. Principles of pathology correction.

Pathological Anatomy. Morphogenesis, classification and structural characteristics in human organ and tissue pathology.

Propaedeutics of Internal Medicine. Age-related anatomical and physiological characteristics of organs and body systems. Methods of a healthy and sick person examination. Additional research methods and principles for the development of diagnostic programs. The diagnostic process. Semiotics and syndromes of major organs and systems pathology. Basics of nutrition therapy in different age groups. International Classification of Diseases.

Radial Diagnostics and Radiation Therapy. Use of radiologic imaging techniques and methods of radiation therapy of various diseases in clinical medicine, their characteristics in different age groups.

As a result of "Clinical Pathological Physiology" studying the student must know:

- etiology, pathogenesis, the most important manifestations of typical pathological processes and reactions, their significance for the organism;

- principles of pathogenic therapy of typical body disorders;

be able to:

- explain the origin and mechanisms of the disease symptoms and syndromes development;

- prove the choice of diagnostic methods of standard pathological processes and the most widespread human diseases;

– choose reasonable pathophysiologically based treatment methods in the most common diseases;

possess:

– skills of pathophysiological analysis of clinical symptoms and syndromes, clinical and laboratory data, functional and other methods of a patient examination.

The structure of the standard Curriculum comprises 38 academic hours, including 20 classroom hours. The approximate distribution of the classroom hours by type of training: lectures - 10 hours, practical training classes - 10 hours.

The recommended form of the acquired knowledge assessment: credit (7th semester).

Form of getting higher education: full-time.

**ALLOCATION OF ACADEMIC TIME
ACCORDING TO SEMESTERS OF STUDY**

Code, name of the speciality	Semester	Number of study hours					Form of ongoing assessment
		Total	Classroom work	including		Out-of-class self-study:	
				Lectures	Practical seminars		
1-79 01 01 "General Medicine"	7	38	20	10	10	18	Credit

THEMATIC PLAN

section/theme	The number of class hours	
	lectures	Practical classes
1. Clinical pathophysiology of inflammation	2	-
Clinical pathophysiology of the organism metabolic disorders	2	-
2 Clinical pathophysiology of respiratory disorders	2	-
3 Clinical pathophysiology of the digestive system	2	-
4 Clinical pathophysiology of the kidneys	2	-
5 Clinical pathophysiology of the cardiovascular system	-	5
6 Clinical pathophysiology of the blood system and hemostasis	-	5
Total amount of hours	10	10

THE CONTENT OF THE TEACHING MATERIAL

1. Clinical pathophysiology of inflammation

Regulation impairment of the inflammatory process as a pathogenic mechanism of the inflammatory diseases. Etiology and pathogenesis of sepsis and septic shock. Correlation of inflammation, disseminated intravascular coagulation and multiple organ failure.

The pathophysiological principles of anti-inflammatory therapy.

2. Clinical pathophysiology of metabolic disorders

Pathogenesis features of different obesity types. Metabolic obesity. Endocrine deregulation in obesity. Metabolically healthy obesity. Obesity as a major cause of the metabolic syndrome. Pathophysiological principles of the metabolic syndrome prevention and treatment.

Hyperlipidemia (hyperlipoproteinemia), pathogenic significance. Pathophysiological characteristics of atherosclerosis.

3. Clinical pathophysiology of respiratory disorders

Typical forms of external respiration disorders. Pathophysiological rationale used in functional diagnosis tests to detect external respiration pathology. Obstructive and restrictive types of alveolar hypoventilation. Clinical pathophysiology of pneumonia, chronic obstructive pulmonary disease (COPD)

and asthma. The pathophysiological principles of the respiratory system diseases prophylaxis and therapy

4. Clinical pathophysiology of the digestive system

Etiology and pathogenesis of gastroduodenal ulcers.

Intestinal digestive disorders. Malabsorption syndrome: causes, pathogenesis, symptoms.

The pathophysiological principles of prevention and treatment of the digestive system diseases.

The main causes of the liver dysfunction. Compensation mechanisms of the hepatic function. The pathophysiological principles of prevention and pathogenetic therapy of liver diseases.

5. Clinical pathophysiology of kidneys

Typical forms of renal diseases. The pathophysiological aspects of clinical syndromes in acute and chronic renal failure. Mechanisms of secondary hypertension formation. Pathophysiology of water and electrolyte imbalance and principles of correction. Pathophysiology of hormonal disorders and the development of anemia. Mechanisms of affected functions compensation.

The physiological mechanism of glomerular filtration and its disturbances in renal diseases (chronic kidney disease, acute kidney injury). The role of the "glomerular filtration rate" index in the evaluation of renal function disorders. Methods for the glomerular filtration rate calculation.

The pathophysiological principles of kidney diseases prevention and treatment.

6. Clinical pathophysiology of the cardiovascular system

Pathological physiology of the coronary heart disease (CHD). The role of coronary arteries atherosclerosis, a vasospastic factor and thrombosis in CHD development.

Pathological physiology of myocardial ischemia, hibernation, stunning and myocardial ischemic preconditioning.

Pathophysiological characteristics of myocardial infarction and its complications. The pathophysiological principles of myocardial infarction treatment: restriction of a necrotic lesion zone, reperfusion of coronary arteries, hemodynamic unloading of the myocardium. The pathophysiological principles of myocardial infarction prevention.

The electrophysiological mechanisms of arrhythmias and heart blockage development.

The pathophysiological mechanisms of chronic heart failure (CHF) development, concept of diastolic and systolic myocardium dysfunction. The pathophysiological bases of chronic heart failure treatment. The pathophysiological principles of CHF prevention.

The pathophysiological mechanisms of medical emergency development in cardiology (cardiogenic pulmonary edema, cardiogenic shock, life-threatening

arrhythmias). Pathophysiological substantiation of the first aid principles in such forms of pathology.

7. Clinical pathophysiology of the blood system and hemostasis

Erythrocytosis: types, causes, mechanisms of development, significance.

Anemia: types, definition, etiology, pathogenesis, classification, manifestations. The adaptive response of the organism in anemia.

Anemia: types of anemia, mechanisms of development of post-hemorrhagic, hemolytic, dyserythropoietic anemia, anemia caused by the impairment of globin synthesis. The features of clinical manifestations depending on the type of anemia and mechanisms of its development. The adaptive response of the organism in anemia. The pathophysiological principles of anemia prevention and treatment.

Typical changes in the system of white blood cells: types and mechanisms of leucopenia development, mechanisms of development and signs of leukocytosis, agranulocytosis. Typical changes of leukocyte formula.

The pathological mechanisms of leukemia and leukemoid reactions.

Thrombocythemia and thrombocytopenia: types, mechanisms of development and clinical presentations. The pathophysiological substantiation of the principles of thrombocythemia and thrombocytopenia prevention and treatment.

The pathophysiological bases of the hemostatic system pathology diagnosis: features of the pathogenesis and manifestations of disseminated intravascular coagulation (DIC), pulmonary embolism (PE). Pathophysiological bases of prophylaxis and treatment of DIC, PE.

Section, topic	Section/theme	Number of hours			Equipment	Form of control
		Lectures	Practical	Self-studies		
1.	Clinical pathophysiology of inflammation	2	-	2	Multimedia projector	Tests, final control tests
2.	Clinical pathophysiology of the metabolic disorders	2	-	2	Multimedia projector	Tests, final control tests
3.	Clinical pathophysiology of the respiratory disorders	2	-	2	Multimedia projector	Tests, final control tests
4.	Clinical pathophysiology of the digestive system	2	-	2	Multimedia projector	Tests, final control tests
5.	Clinical pathophysiology of the kidneys	2	-	2	Multimedia projector	Tests, final control tests
6.	Clinical pathophysiology of the cardiovascular system	-	5	4	Multimedia projector	Interview, tests, final ocontrol tests
7.	Clinical pathophysiology of the blood system and hemostasis	-	5	4	Multimedia projector	Interview, tests, final control tests, credit
		10	10	18		

INFORMATION AND METHODOLOGICAL PART LITERATURE

Basic:

1. *Clinical Pathophysiology*: textbook / P.F. Litvitskiy. – M.: Practical Medicine, 2015. – 776 p.
2. *Clinical Pathophysiology*: lecture course / V.A. Chereshev, P.F. Litvitskiy, V.N. Cygan. – S.-P.: SpecLit, 2015. – 472 p.
3. *Clinical Pathophysiology*. Atlas, translated from Eng. / S. Zilbernagl, F. Lang. – M.: Practical Medicine, 2015. – 448 p.

Additional:

4. *Pathophysiology*: textbook: in 2 vol. / edited by V.V. Novitski, E.D. Goldberg, O.I. Urazova. – 4 th ed. rev. and ext. – M.: GEOTAR – Media, 2015 – V 1 – 848 p.. *Pathophysiology*: textbook: in 2 vol. / edited by V.V. Novitski, E.D. Goldberg, O.I. Urazova. – 4 th ed. rev. and ext. – M.: GEOTAR – Media, 2015 – V. 2 – 640 p.
6. *Pathophysiology*: lecture course: educational supply / edited by G.V. Poryadin. – M.: GEOTAR – Media, 2014. – 592 p.
7. *Pathophysiology*. Exercises and test tasks: study guide / P.F. Litvitskiy, [et al.]; edited by P.F. Litvitskiy. – M.: GEOTAR-Media, 2013. – 384 p.
8. *Yefremov, A. V.* Pathophysiology. Main Definitions [Electronic resource]: tutorial / A.V. Yefremov, E.N. Samsonova, Y.V. Nacharov / edited by A.V. Yefremov. 2010. – 256 p. – Mode access :
<http://www.studmedlib.ru/ru/book/ISBN9785970416365.html>
9. *Dementieva, II.* Pathology of the Hemostasis System [Electronic resource]: handbook / I.I. Dementeva, M.A. Charnaya, Y.A. Morozov. – M, 2013. – 288 p. – Mode access :
<http://www.studmedlib.ru/ru/book/ISBN9785970424773.html>
10. *System of Hemostasis during Operations on the Heart and Great Vessels. Disorders, Prophylaxis, Correction*: handbook for doctors. I.I. Dementeva, M.A. Charnaya, Y.A. Morozov. – 2009. – 432 p.

LIST OF AVAILABLE DIAGNOSTIC TOOLS

The following forms are used for the diagnosis of competencies:

1. The oral form:
 - interview;
 - oral credit;
2. The written form:
 - tests;
 - final control tests

LIST OF PRACTICAL SKILLS

1. Interpretation of a general blood test.
2. Interpretation of a general urine analysis.
3. Interpretation of a glycemic profile data, tolerance to glucose test, glycosylated hemoglobin data.
4. Interpretation of a lipidogram.
5. Interpretation of a biochemical blood test (ionogram, markers of inflammation, indicators of protein exchange etc.).
6. Interpretation of myocardium injury markers.
7. Interpretation of the D-dimer level and markers data in heart failure.
8. Interpretation of a myelogram.
9. Interpretation of a coagulogram.
10. Determination of a glomerular filtration rate.
11. Interpretation of a spirogram.
12. Interpretation of an electrocardiogram.

LIST OF LECTURES

7th semester

1. Clinical pathophysiology of inflammation
2. Clinical pathophysiology of the organism metabolic disorders
3. Clinical pathophysiology of the respiratory disorders
4. Clinical pathophysiology of the digestive system
5. Clinical pathophysiology of the kidneys

LIST OF PRACTICAL CLASSES

7th semester

1. Clinical pathophysiology of the cardiovascular system
2. Clinical pathophysiology of the blood system and hemostasis

**PROTOCOL OF THE CURRICULUM APPROVAL
BY OTHER DEPARTMENTS**

Title of the discipline requiring approval	Department	Amendments to the Curriculum of the academic discipline	Decision of the Department, which designed the Curriculum (date, protocol number)
1. Normal Physiology	Normal Physiology	No amendments made	Approved: protocol №10 of 29.05.2018
2. Pathological Physiology	Pathological Physiology	No amendments made	Approved: protocol №10 of 29.05.2018.

COMPILED BY:

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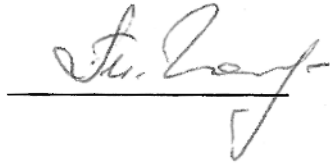
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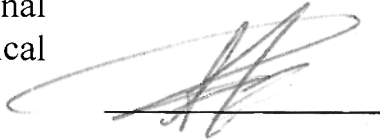
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Curriculum content, composition and accompanying documents comply with the
established requirements.

Dean of the Medical Faculty for
International Students

04.10. 2018г.



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