

# SYLLABUS

## 1. General information on the course

<b>Full course name</b>	Internal Medicine
<b>Full official name of a higher education institution</b>	Sumy State University
<b>Full name of a structural unit</b>	Medical Institute. Department of Internal Medicine with a Center of respiratory medicine
<b>Author(s)</b>	Fadieieva Hanna Anatoliivna
<b>Cycle/higher education level</b>	The Second Level Of Higher Education, National Qualifications Framework Of Ukraine – The 7th Level, QF-LLL – The 7th Level, FQ-EHEA – The Second Cycle
<b>Semester</b>	4 weeks during the 9-th semester
<b>Workload</b>	5 ECTS credits, 150 hours, which include 110 hours of contact work with the teacher (90 hours of practical classes and 20 hours of lectures), and 40 hours of self-work
<b>Language(s)</b>	English

## 2. Place in the study programme

<b>Relation to curriculum</b>	Compulsory course available for study programme "Medicine"
<b>Prerequisites</b>	KROK-1, necessary knowledge of Latin, medical terminology, medical biology, medical informatics, human anatomy, physiology, histology, cytology and embryology, pathophysiology, biological and bioorganic chemistry, microbiology, virology and immunology, pathomorphology, pharmacology, hygiene and ecology, propaedeutics to internal diseases, nursing practice and radiology
<b>Additional requirements</b>	There are no specific requirements
<b>Restrictions</b>	There are no specific restrictions

## 3. Aims of the course

is the acquisition of modern knowledge and professional skills in internal medicine, which includes diseases of the cardiovascular system, joints, connective tissue, kidneys based on knowledge of medical biology, normal anatomy, normal physiology, histology, embryology, biochemistry, microbiology and virology, pathomorphology, pathophysiology, pharmacology and practical skills of clinical, laboratory and instrumental examination of the patient in compliance with principles of medical ethics

## 4. Contents

## **Module 1. The principles of diagnosis, treatment, and prevention of the major diseases of cardiovascular system**

### Topic 1 Arterial hypertension

Definition. The role of disorders connected with central and renal mechanisms of pressure regulation, endothelial dysfunction, and other factors. Classification. Clinical features and results of additional methods of examination. Hypertension-mediated organ damage. Differential diagnosis. Risk stratification. Complications. Isolated systolic arterial hypertension. Evidence-based treatment. Complicated and uncomplicated hypertensive crisis. Peculiarities of the treatment strategy. The leading causes, peculiarities of the clinic, diagnostic of renal (renovascular, renoparenchymatous), endocrine (Cushing's syndrome, pheochromocytoma, Conn's syndrome, diffuse toxic goiter) and haemodynamic arterial hypertension. Arterial hypertension during pregnancy and metabolic disorders (metabolic syndrome). The role of laboratory and instrumental methods in differential diagnosis and verification of diagnosis. Therapeutic and surgical treatment. Primary and secondary prevention. Prognosis and working capacity. Management of patients in the infectious epidemic.

### Topic 2 Atherosclerosis.

Definition. The role of hyperlipidemias, general and local inflammation, damage of the vascular wall and platelets in the development of atherosclerosis. Risk factors. Clinical features depending on predominant localization (aorta, coronary, mesenteric and renal arteries, arteries of lower extremities). The role of laboratory, radiation and other instrumental methods of investigation. Differential diagnosis. Complications. General principles of treatment. Evidence-based treatment strategy according to different variants of course. Primary and secondary prevention. Prognosis and working capacity.

### Topic 3 Chronic forms of ischaemic heart disease (IHD).

Clinical and diagnostical features of different forms of stable angina. Painless forms of IHD (Painless myocardial ischaemia, postMI, diffuse cardiosclerosis). Clinical features. Diagnostic criteria. Differential therapy of different forms of IHD. Percutaneous coronary interventions in patients with IHD. Evidence-based treatment of angina attacks, acute left-sided heart failure. Prognosis and working-capacity.

### Topic 4 IHD: acute myocardial infarction.

Definition. The role of atherosclerosis, destabilization of atherosclerotic plaque and functional factors in the pathogenesis of different forms of IHD. Classification. The peculiarities of clinic and diagnostic of acute myocardial infarction. Definition of "acute coronary syndrome". Classification and clinical features of myocardial infarction. Diagnostic criteria. Differential diagnosis of the forms of the acute coronary syndrome. Invasive treatment of myocardial infarction. Complications of acute myocardial infarction. Evidence-based treatment strategy in different periods of acute myocardial infarction. Indications for surgical treatment. Rehabilitation. Primary and secondary prevention. Management of patients in the infectious epidemic.

#### Topic 5 Heart failure.

Definition. The main causes. Pathogenesis of central and peripheral hemodynamic disorders in different forms (left-sided and right-sided heart failure). The role of neurohumoral activation and heart remodeling. Classification. Clinical manifestation and features according to the variant (systolic, diastolic), stage, and functional class. Diagnostic. Evidence-based treatment. Primary and secondary prevention. Prognosis and working-capacity. Management of patients in the infectious epidemic.

#### Topic 6 Heart rhythm disorders.

Definition. Aetiology. Electrophysiological mechanisms of arrhythmias (extrasystole, atrial fibrillation and flutter, ventricular tachycardia and ventricular fibrillation). Clinical features, ECG-diagnostic and differential diagnostic. Complications. Medical and non-medical methods of Evidence-based treatment. The role of electropulse therapy. Urgent therapy in paroxysmal arrhythmias and sudden cardiac death. Primary and secondary prevention. Prognosis and ability to work. Definition, etiology, classification of conduction disorders. Clinical, ECG-diagnostic of AV-block and bundle-branch block. The strategy of acute and chronic conduction heart disorders. Emergency in Stokes-Adams syndrome. Indications and principles for pacemaker implantation (temporary, permanent). Primary and secondary prevention. Prognosis and working-capacity.

#### Topic 7 Acquired heart valve diseases.

Definition. Mitral, aortic, tricuspid valves diseases. Aetiology, mechanisms of hemodynamic disorders. Classification. Combined mitral and aortic valves diseases. Clinical features. The role of invasive and noninvasive methods. Differential diagnosis. Complications. Evidence-based management. Indications for surgical treatment. Primary and secondary prevention. Prognosis and working capacity.

#### Topic 8 Infective endocarditis. Pericarditis.

Definition. Aetiology, pathogenesis. Clinical features according to the pathogen. Diagnostic criteria. The role of laboratory methods and echocardiography in diagnosis. Complications (heart failure, embolism, abscesses). Evidence-based treatment. Regimes of antibacterial therapy. Indications for surgery. Primary and secondary prevention. Prognosis and working capacity. Definition. Aetiology, pathogenesis. Classification. Peculiarities of clinic, forms and diagnostic of different types of pericarditis. Methods of diagnosis verification. Differential diagnosis of myocardial injury. Cardiac tamponade. Indications for a pericardial puncture, it's diagnostic and treatment aim. Differentiated therapy of various forms according to etiological factors. Prevention. Prognosis and working capacity.

#### Topic 9 Myocarditis. Cardiomyopathies.

Definition of cardiomyopathies. Classification. Aetiology and pathogenesis of main types of cardiomyopathies. Clinical features, findings on ECG, echocardiography and other methods of investigation (X-Ray) according to aetiological factors, type, and severity. Complications. Evidence-based treatment strategy of different cardiomyopathies. Primary and secondary prevention. Prognosis and working capacity. Definition of myocarditis, classification, clinical features, findings of ECG, echocardiography and other methods of investigation. Treatment strategy according to the severity and aetiological factors. Primary and secondary prevention. Prognosis and working-capacity.

Topic 10 Pulmonary embolism (PE).

Definition and classification of PE. Risk factors. Pathogenesis of hemodynamic disorders. Clinical features of different forms. Diagnostic criteria and differential diagnosis. Instrumental methods of diagnosis and their significance. Evidence-based treatment. Indications for surgical treatment. Primary and secondary prevention. Prognosis and working capacity. Management of patients in the infectious epidemic.

**Module 2. The principles of diagnosis, treatment, and prevention of major diseases of the musculoskeletal system and connective tissue**

Topic 11 Rheumatoid arthritis.

Definition. Etiological factors, pathogenesis. Classification and nomenclature. Clinical features according to the activity of pathological process, stage of the disease, systemic manifestations. Activity evaluation index. Laboratory and instrumental methods of diagnostic and its significance in diagnostic od disease, its stages and activity. Diagnostic criteria. Differential diagnosis. Complications. Evidence-based treatment. Basic therapy. Prevention. Prognosis and working capacity. Management of patients in the infectious epidemic.

Topic 12 Connective tissue diseases.

Systemic lupus erythematosus. Definition. Etiological factors and pathogenesis. Classification. Clinical features according to the activity of disease, disorders in organs and systems. The significance of laboratory, immunological methods of examination. Diagnostic criteria. Differential diagnosis. Complications. Evidence-based treatment strategy. Pulse therapy. Prevention. Prognosis and working capacity. Systemic sclerosis and dermatomyositis. Definition. Etiological factors and pathogenesis. Classification. Clinical features according to the disorders in organs and systems. Diagnostic criteria. Differential diagnosis. Complications. Treatment strategy. Prevention. Prognosis and working-capacity. Management of patients in the infectious epidemic.

Topic 13 Systemic vasculitis.

Classification. ANCA-associated vasculitis. Laboratory and instrumental methods of diagnostic and its significance. Differential diagnosis. Evidence-based treatment. Prognosis and working capacity. Management of patients in the infectious epidemic.

Topic 14 Reactive arthritis.

Definition. Etiological factors and pathogenesis. Classification. Clinical features according to the etiology. Significance of laboratory and instrumental methods of diagnostic. Diagnostic criteria. Differential diagnosis. Evidence-based treatment, indications for antibacterial therapy. Prognosis and working capacity.

Topic 15 Ankylosing spondylitis.

Definition. Etiological factors and pathogenesis. Classification. Clinical features. Significance of laboratory and instrumental methods. Diagnostic criteria. Differential diagnosis. Evidence-based treatment. Prevention. Prognosis and working-capacity.

Topic 16 Psoriatic arthritis.

Definition. Etiological factors and pathogenesis. Classification. Clinical features. Significance of laboratory and instrumental methods. Diagnostic criteria. Differential diagnosis. Evidence-based treatment. Prevention. Prognosis and working-capacity.

Topic 17 Gout. Osteoarthritis.

Definition of gout. Aetiology and pathogenesis. Classification. Clinical features. Diagnostic Peculiarities of joint syndrome and internal organ's damage. Differential diagnosis. Evidence-based treatment. Primary and secondary prevention. Prognosis and working capacity. Definition of osteoarthritis. Aetiology and pathogenesis. Classification. Clinical features. Diagnostic criteria. Differential diagnosis. Complications. Differential treatment strategy. Prevention. Prognosis and working-capacity.

### **Module 3. The principles of diagnosis, treatment and prevention of the major diseases of genitourinary system**

Topic 18 Glomerulonephritis. Amyloidosis.

Definition of glomerulonephritis. Aetiology, the role of streptococcal infection and immunological disorders in disease development. Pathogenesis of main clinical syndromes. Classification. Clinical features and diagnostic of various forms. Differential diagnosis. Complications (eclampsia, acute and chronic renal failure, and others). Evidence-based treatment according to morphological variant and clinical features. Primary and secondary prevention. Prognosis and working-capacity.

Topic 19 Urinary tract infections: pyelonephritis.

Definition. The role of streptococcal infection in the development of kidney and urinary tract disorders. Primary and secondary pyelonephritis. Clinical features. Laboratory and instrumental methods of diagnostic. Differential diagnosis. Complications. Evidence-based treatment. Primary and secondary prevention. Prognosis and working capacity.

Topic 20 Acute kidney injury (AKI).

Definition. Etiological factors. Clinical features. Changes in laboratory indications. Differential diagnosis between prerenal and renal AKI. Complications. Etiological treatment. Renal replacement therapy, therapy of complications. Contrast-induced nephropathy. Prevention. Prognosis. Definition, etiology and pathogenesis of tubulointerstitial nephritis. Clinical features. Diagnostic criteria and differential diagnosis. Complications. Evidence-based treatment. Emergency for acute kidney injury. Prevention. Prognosis and working-capacity.

Topic 21 Chronic kidney disease (CKD). Chronic renal failure.

Definition. Etiological factors. Pathogenesis of organs and systems disorders, its clinical features. Classification. Clinical features and changes in laboratory indicators. Differential diagnosis. Complications. Evidence-based treatment according to different stages. Renal replacement therapy. Indications and contraindications for renal replacement therapy, complications. Primary and secondary prevention. Prognosis and working capacity. Management of patients in the infectious epidemic.

Topic 22 Case history presentation.

Case history presentation includes questions connected with the peculiarities of anamnesis collection, methodic of examination, explaining of preliminary diagnosis, creating the plan of examination and interpretation the results of laboratory and instrumental investigation, making differential diagnosis; interpretation of final clinical diagnosis, treatment and methods of secondary prevention in each case in accordance with the diseases of the patient.

### **Module 4. Military therapy**

Topic 23 Organization of therapeutic care in wartime and peacetime emergencies.

General questions of therapeutic care organization in wartime. Characteristic of modern combat therapeutic pathology. Sanitary losses of therapeutic profile. Medical sorting of affected persons at the stages of first qualified and specialized therapeutic care in peacetime emergencies.

Topic 24 Radiation-related disorders. Clinical characteristic of ionizing radiation. Pathogenesis of radiation sickness. Clinical classification of ionizing radiation, acute radiation sickness. The conception of radiation trauma.

The critical links of biological effects of ionizing radiation and the pathogenesis of the main clinical forms of radiation damage. The clinic, diagnostic and treatment of radiation trauma. The definition of acute radiation sickness. Clinic and diagnostic of different forms of acute radiation sickness. The peculiarities of radiation damage in peacetime.

Topic 25 Acute radiation sickness. Bone marrow form of acute radiation sickness.

Clinic and diagnostic. Classification of bone marrow form of acute radiation sickness. Clinical features in different periods of illness. Differential and diagnostic criteria of illness degrees. Determination of life-threatening conditions in each period of the disease.

Topic 26 Step therapy of patients with acute radiation sickness. Atypical forms of acute radiation sickness.

The principles of pathogenetic treatment of acute radiation sickness according to the main features. The content of medical care for affected by ionized radiation persons on different steps of medical care. The types of atypical forms of acute radiation sickness. Clinical features of acute radiation sickness in case of external uneven irradiation, radiation combined injury, internal irradiation, coexistent irradiation, neutron radiation damage, prolonged small doses irradiation. Evidence-based medical care on different steps of medical evacuation in the case of atypical forms of acute radiation sickness.

Topic 27 Internal organs damage during combat surgical trauma and injuries during peacetime catastrophes and accidents. Complications. Prevention. Treatment.

Classification of pathological changes of internal organs in wounded persons. Syndromes of the gunshot wound. Diseases of respiratory organs in wounded persons. Diseases of circulatory organs in wounded persons. Diseases of digestive organs in wounded persons. Kidney diseases in wounded persons. Evidence-based treatment of internal organs diseases in wounded persons on different steps of medical evacuation. Prevention of internal organs diseases in wounded persons. Burn disease, definition, classification. Pathogenesis of the main clinical features and complications during different periods of diseases. Typical complications of burn disease, diagnostic. Step therapy of burn disease.

Topic 28 Emergencies, therapeutic care for life-threatening conditions during different steps of medical evacuation. Poisonous substances injury in wartime and peacetime.

General characteristic of poisonous substances injury, classification, diagnostic. Step evidence-based treatment of poisonous substances injury in wartime. The organization of emergency therapeutic care in case of acute poisoning on different steps of medical evacuation. The content of medical care. The peculiarities of poisonous substances injury in wartime and peacetime in the chemical factory.

<p>Topic 29 Diseases caused by the action of thermal factors (warm and cold).  Definition of overheating and hypothermia. Complications of internal organs during the action of thermal factors. Peculiarities of clinic, diagnostic. Prevention and evidence-based step therapy.</p>
<p>Topic 30 Practice-oriented exam</p>

## 5. Intended learning outcomes of the course

After successful study of the course, the student will be able to:

LO1	To interview and to do the objective examination of patients with diseases of cardiovascular system, joints, connective tissue, kidney according to ethical aspects. Ability to justify and apply clinical methods in understanding of diseases manifestation.
LO2	To make a plan of laboratory and instrumental methods of examination of patients with heart, joint, connective tissue, kidney disorders. To justify the use of the basic invasive and non-invasive diagnostic methods in cardiology, rheumatology, nephrology, to determine the indications and contraindications for them, possible complications. To interpret the results of laboratory methods of examination.
LO3	Be able to make a differential diagnosis, interpretate and formulate the diagnosis based on analyzing of the laboratory and instrumental examination results.
LO4	To determine the necessary workmode, rest-time and diet in the treatment of heart, joints, connective tissue, kidney diseases.
LO5	To prescribe evidence-based treatment, to do prevention of heart, joints, connective tissue, kidney diseases, to do medical manipulations (ECG registration in 12 leads, measurement of blood pressure, oxygen saturation, intravenous injections, cardiopulmonary resuscitation, etc.)
LO6	To diagnose and to provide emergency medical procedures in: circulatory and respiratory arrest, hypertensive crisis, paroxysmal heart rhythm disorders, Stokes-Adams syndrome, acute renal failure. To carry out medical and evacuation measures in ionizing radiation, extreme temperatures, injuries in wartime and peacetime emergencies.
LO7	To solve medical problems in new or unfamiliar situations (disasters and peacetime accidents) in the presence of incomplete or limited information according to the principles of social and ethical responsibility. To demonstrate the ability of moral and deontological principles as a medical specialist and the principles of professional subordination.
LO8	To implement the sanitary, hygienic and preventive measures in the case of pathological changes in peacetime and wartime.
LO9	To determine disability status in patients with cardiological, joints, connective tissue, kidneys diseases.
LO10	To fill in and keep medical documentation, including electronic forms.
LO11	To evaluate the environmental impact, social, economic, biological determinants on the health of the patient with cardiological, rheumatological and nephrological diseases.

LO12	To integrate knowledge and to solve complex healthcare issues in multidisciplinary contexts.
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## 6. Role of the course in the achievement of programme learning outcomes

Programme learning outcomes achieved by the course.

For 222 Medicine:

PO1	To detect and identify the leading clinical symptoms and syndromes (according to the List 1); to establish the most probable nosological or syndromic preliminary clinical diagnosis of diseases (according to the List 2) using standard methods, preliminary data of the patient's anamnesis, patient's examination data, and knowledge about a human, his organs and systems.
PO2	To collect information about the patient's general condition; to assess the patient's psychomotor and physical development and the state of organs and systems of the body; to assess information on the diagnosis (according to the List 4) based on laboratory and instrumental findings.
PO3	To order and analyze additional (mandatory and optional) examinations (laboratory, radiological, functional and/or instrumental) (according to the List 4) in order to perform a differential diagnosis of diseases (according to the List 2).
PO4	To establish a final clinical diagnosis at a medical institution under control of a supervising doctor by means of informed decision and logical analysis of the obtained subjective and objective data of clinical and additional examinations, and differential diagnosis, following the relevant ethical and legal norms (according to the List 2).
PO5	To detect the key clinical syndrome or the reason for patient's condition severity (according to the List 3) via informed decision and evaluation of the person's state under any circumstances (at home, in the street, at a healthcare facility), including under emergency and military operation conditions, in the field, with a lack of information and limited time.
PO6	To determine the nature and treatment principles (conservative, operative) in patients with diseases (according to the List 2) at a healthcare facility, at patient's home or during medical evacuation process (including in the field), based on the provisional clinical diagnosis and observing the relevant ethical and legal norms, by making a reasonable decision according to existing algorithms and standard procedures based on the principles of evidence-based medicine; if needed to go beyond the standard scheme, to substantiate the personalized recommendations under control of a supervising doctor at a medical facility.
PO7	To determine an appropriate work and rest mode in the treatment of diseases (according to the List 2) at a healthcare institution, at patient's home and during medical evacuation (including in the field), based on the provisional clinical diagnosis and observing the relevant ethical and legal norms, by making a reasonable decision according to existing algorithms and standard procedures.
PO8	To determine an appropriate diet in the treatment of diseases (according to the List 2) at a healthcare institution, at patient's home and during medical evacuation (including in the field), based on the provisional clinical diagnosis and observing the relevant ethical and legal norms, by making a reasonable decision according to existing algorithms and standard procedures.



PO11	To determine the appropriate approach in emergency medical care case under any circumstances, adhering to the relevant ethical and legal norms, by making an informed decision based on the main clinical syndrome (disease severity) and emergency diagnosis (according to the List 3) using standard schemes under limited time conditions based on the principles of evidence-based medicine.
PO12	To provide emergency medical assistance under any circumstances, adhering to the relevant ethical and legal norms, by making an informed decision based on the main clinical syndrome (disease severity) and emergency diagnosis (according to the List 3) using standard schemes and predetermined approach under limited time conditions based on the principles of evidence-based medicine.
PO13	To organize medical evacuation procedures among the population and the military under emergency and military operation conditions (including in the field), and during the phases of medical evacuation, given the existing system of medical evacuation provision.
PO14	To perform medical procedures (according to the List 5) at a medical facility, at home or at work on the basis of a provisional clinical diagnosis and/or health parameters through making an informed decision and adhering to the relevant ethical and legal norms.
PO15	To perform procedures related to emergency medical assistance within a limited time and under any circumstances, using standard schemes on the basis of a medical emergency diagnosis (according to the List 3).
PO16	To plan and implement a system of sanitary and preventive measures against the occurrence and spread of diseases among the population.
PO18	To search for the necessary information in the professional literature and databases; to analyze, evaluate, and apply this information. To apply modern digital technologies, specialized software, statistical methods of data analysis to solve complex health problems.
PO19	To assess environmental impact on public health.
PO21	To organize an appropriate level of individual safety (own and of those cared for) in case of typical dangerous situations in the individual field of activity.

## 7. Teaching and learning activities

### 7.1 Types of training

<p><b>Topic 1. Arterial hypertension</b></p> <p>pr.tr.1 "Essential arterial hypertension"</p> <p>The definition. The role of disorders connected with central and renal mechanisms of pressure regulation, endothelial dysfunction and other factors. Classification. Clinical features and results of additional methods of examination. Hypertension-mediated organ damage. Differential diagnosis. Risk stratification. Complications. Isolated systolic arterial hypertension. Evidence-based treatment. Complicated and uncomplicated hypertensive crisis. Treatment strategy peculiarities. Prognosis and working-capacity.</p>
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pr.tr.2 "Secondary (symptomatic) arterial hypertension"

The definition. The leading causes, peculiarities of clinic, diagnostic of renal (renovascular, renal parenchymal), endocrine (Cushing's syndrome, pheochromocytoma, Conn's syndrome, diffuse toxic goiter) and haemodynamic arterial hypertension. Arterial hypertension during pregnancy and metabolic disorders (metabolic syndrome). The role of laboratory and instrumental methods in differential diagnosis and verification of diagnosis. Evidence-based treatment. Primary and secondary prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks), training of physical examination skills in ambulatory care/hospital or applying role-playing games in the case of quarantine in the hospital using of phonendoscope, the tonometer for blood pressure measurement. Application of virtual simulation (watching films about the methods of clinical examination of cardiovascular system, including ultrasound of the heart, angiography), instrumental methods (height and weight measurements, work with electrocardiograph, MRI data, brain and chest CT scan data) and laboratory examination (using of glucometer, assessment of electrolyte changes, hormone levels) with further discussing of the results for risk stratification. Acquaintance with the method of carrying out and interpretation of the obtained data of X-ray and ultrasound examination of the heart and vessels.

**Topic 2. Atherosclerosis.**

pr.tr.3 "Atherosclerosis"

Definition. The role of hyperlipidemias, general and local inflammation, damage of the vascular wall and platelets in the development of atherosclerosis. Risk factors. Clinical features depending on predominant localization (aorta, coronary, mesenteric and renal arteries, arteries of lower extremities). The role of laboratory, radiation and other instrumental methods of investigation. Differential diagnosis. Complications. General principles of treatment. Evidence-based treatment strategy according to different variants of course. Primary and secondary prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks in teams), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital using the phonendoscope, the tonometer. Application of instrumental (work with electrocardiograph, MRI data, CT scan data, ultrasound data, Doppler echocardiography) and laboratory (using of glucometer, assessment of electrolyte changes, lipid profile levels) methods of examination with further discussing of the results for risk stratification. Discussing the management strategy and prescription of treatment.

**Topic 3. Chronic forms of ischaemic heart disease (IHD).**

lect.1 "Ischaemic heart disease." (full-time course)

Teaching is carried out in the form of a multimedia lecture (in quarantine – in the on-line regime).

pr.tr.4 "Chronic forms of ischaemic heart disease (IHD)"

Clinical and diagnostical features of different forms of stable angina. Painless forms of IHD (painless myocardial ischaemia, postMI, diffuse cardiosclerosis). Clinical features. Diagnostic criteria. Differential therapy of different forms of IHD. Percutaneous coronary interventions in patients with IHD. Evidence-based treatment of angina attacks, acute left-sided heart failure. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying role-playing games in the case of quarantine in the hospital using the phonendoscope, the tonometer. Application of virtual simulation (watching films about the methods of clinical examination of cardiovascular system, including ultrasound of the heart, angiography), instrumental (work with electrocardiograph, ECG data, Holter monitoring, echocardiography) and laboratory (using of glucometer, assessment of electrolyte, hormone levels) methods of examination with further discussing of the results. Acquaintance with the method of carrying out of X-ray and ultrasound examination of the heart and blood vessels and interpretation of the obtained data in the departments of the medical institution (according to the cooperation agreement between the medical institution and the university).

**Topic 4. IHD: acute myocardial infarction.**

lect.2 "Acute coronary syndrome (ACS). Interventional methods of diagnosis and treatment in cardiology."

Teaching is carried out in the form of a multimedia lecture (in quarantine - in the on-line regime). Acute coronary syndrome. Definition. The role of atherosclerosis, destabilization of atherosclerotic plaque and functional factors in the pathogenesis of different forms of IHD. Classification. The peculiarities of clinic and diagnostic of acute myocardial infarction. Definition of "acute coronary syndrome". Classification and clinical features of myocardial infarction. Diagnostic criteria. Differential diagnosis of the forms of the acute coronary syndrome. Complications of acute myocardial infarction. Treatment strategy in different periods of acute myocardial infarction. Treatment strategy in different periods of acute myocardial infarction. Indications for surgical treatment. Rehabilitation. Primary and secondary prevention.

pr.tr.5 "IHD: acute myocardial infarction"

Definition. The role of atherosclerosis, destabilization of atherosclerotic plaque and functional factors in the pathogenesis of different forms of IHD. Classification. The peculiarities of clinic and diagnostic of acute myocardial infarction. Definition of "acute coronary syndrome". Classification and clinical features of myocardial infarction. Diagnostic criteria. Differential diagnosis of the forms of the acute coronary syndrome. Complications of acute myocardial infarction.

pr.tr.6 "Treatment of acute coronary syndrome"

Evidence-based treatment strategy in different periods of acute myocardial infarction. Indications for surgical treatment. Rehabilitation. Primary and secondary prevention. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks in teams), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital using the phonendoscope, the tonometer. Application of virtual simulation (watching films about the methodic of coronary angiography, electrical cardioversion, pacing, respiratory support), instrumental (work with electrocardiograph, pulse oximeter, ECG data, coronary angiography, heart ultrasound, X-Ray data) and laboratory (using of glucometer, assessment of INR, APTT, lipid profile, biomarkers) methods of examination with further discussing of the results. Discussing the management strategy and prescription of treatment. Performing of intravenous injections and cardiopulmonary reanimation in the simulation center on phantoms. Acquaintance with the method of carrying out ultrasound examination of the heart, blood vessels, coronarography, defibrillation in the departments of the medical institution (according to the agreement of cooperation between the medical institution and the university).

**Topic 5. Heart failure.**

lect.3 "Heart failure."

Heart failure. Definition. The main causes. Pathogenesis of central and peripheral hemodynamic disorders in different forms (left-sided and right-sided heart failure). The role of neurohumoral activation and heart remodeling. Classification. Clinical manifestation and features according to the variant (systolic, diastolic), stage and functional class. Diagnostic. Treatment of heart failure. Primary and secondary prevention. Prognosis and working capacity. Teaching is carried out in the form of a multimedia lecture (in quarantine – in the on-line regime).

pr.tr.7 "Heart failure: diagnostic."

Definition. The main causes. Pathogenesis of central and peripheral hemodynamic disorders in different forms (left-sided and right-sided heart failure). The role of neurohumoral activation and heart remodeling. Classification. Clinical manifestation and features according to the variant (systolic, diastolic), stage and functional class. Diagnostic.

pr.tr.8 "Heart failure: treatment."

Evidence-based treatment of heart failure. Primary and secondary prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks in teams), training skills in collection of complaints and anamnesis data, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of virtual simulation (watching films about the methodic of coronary angiography, electrical cardioversion, pacing, respiratory support), instrumental (work with electrocardiograph, pulse oximeter, ECG data, coronary angiography, heart ultrasound, X-Ray data) and laboratory (using of glucometer, assessment of INR, APTT, lipid profile, biomarkers) methods of examination with further discussing of the results. Discussing the management strategy and prescription of treatment. Performing of intravenous injections and cardiopulmonary reanimation in the simulation center on phantoms. Acquaintance with the methodic of carrying out and interpretation of X-Ray data, ultrasound examination of the heart in the departments of the medical institution.

**Topic 6. Heart rhythm disorders.**

lect.4 "Heart rhythm disorders."

Teaching is carried out in the form of a multimedia lecture (in quarantine – in the on-line regime). Supraventricular arrhythmias. Definition. Etiology. Electrophysiological mechanisms of arrhythmias (extrasystole, atrial fibrillation and flutter). Clinical features, ECG-diagnostic and differential diagnostic. Complications. Medical and non-medical methods of treatment. The role of electropulse therapy. Urgent therapy for paroxysmal arrhythmias and sudden cardiac death. Primary and secondary prevention. Prognosis, working capacity. Ventricular arrhythmias. Definition. Aetiology. Electrophysiological mechanisms of arrhythmias (extrasystole, ventricular tachycardia and ventricular fibrillation). Clinical features, ECG-diagnostic and differential diagnostic. Complications. Medical and non-medical methods of treatment. The role of electropulse therapy. Urgent therapy for paroxysmal arrhythmias and sudden cardiac death. Primary and secondary prevention. Prognosis, working capacity.

lect.5 "Heart conduction disorders."

Heart conduction disorders. Definition, aetiology, and classification of conduction disorders. Clinical, ECG-diagnostic of AV-block and bundle-branch block. The strategy of acute and chronic conduction heart disorders. Emergency in Stokes-Adams syndrome. Indications and principles for pacemaker implantation (temporary, permanent). Primary and secondary prevention. Prognosis and working capacity. Teaching is carried out in the form of a multimedia lecture (in quarantine – in the on-line regime).

pr.tr.9 "Supraventricular arrhythmias"

Definition. Aetiology. Electrophysiological mechanisms of arrhythmias (extrasystole, atrial fibrillation and flutter). Clinical features, ECG-diagnostic and differential diagnostic. Complications. Medical and non-medical methods of treatment. The role of electropulse therapy. Urgent evidence-based therapy for paroxysmal arrhythmias and sudden cardiac death. Primary and secondary prevention. Prognosis, working capacity.

pr.tr.10 "Ventricular arrhythmias"

Definition. Aetiology. Electrophysiological mechanisms of arrhythmias (extrasystole, ventricular tachycardia and ventricular fibrillation). Clinical features, ECG-diagnostic and differential diagnostic. Complications. Medical and non-medical methods of evidence-based treatment. The role of electropulse therapy. Urgent therapy for paroxysmal arrhythmias and sudden cardiac death. Primary and secondary prevention. Prognosis, working capacity.

pr.tr.11 "Heart conduction disorders"

Definition, aetiology, and classification of conduction disorders. Clinical, ECG-diagnostic of AV-block and bundle-branch block. The strategy of acute and chronic conduction heart disorders. Emergency in Stokes-Adams syndrome. Indications and principles for pacemaker implantation (temporary, permanent). Primary and secondary prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks in teams), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital using the phonendoscope, the tonometer. Application of instrumental (work with electrocardiograph, ECG data) and laboratory (using of glucometer, assessment of INR, APTT, lipid profile, biomarkers) methods of examination with further discussion of the results. Discussing the management strategy and prescription of treatment. Doing of intravenous injections. Acquaintance with the methodic of carrying out and interpretation of Holter monitoring in the departments of the medical institution (according to the agreement of cooperation between the medical institution and the university). Application of virtual simulation (watching films about the methodic of radiofrequency catheter ablation, electrical cardioversion, pacing).

**Topic 7. Acquired heart valve diseases.**

pr.tr.12 "Acquired heart valve diseases"

Definition. Mitral, aortic, tricuspid valves diseases. Aetiology, mechanisms of hemodynamic disorders. Classification. Combined mitral and aortic valves diseases. Clinical features. The role of invasive and noninvasive methods. Differential diagnosis. Complications. Evidence-based treatment. Indications for surgical treatment. Primary and secondary prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of virtual simulation (watching videos about the methodic of electrical cardioversion, respiratory support), instrumental (work with electrocardiograph, pulse oximeter, ECG data, ultrasound of the heart data, X-Ray data) and laboratory (using of glucometer, assessment of INR, APTT) methods of examination with further discussing of the results. Discussing the management strategy and prescription of treatment. Doing of intravenous injections. Acquaintance with the methodic of carrying out and interpretation of X-ray data, ultrasound examination of the heart in the departments of the medical institution.

**Topic 8. Infective endocarditis. Pericarditis.**

pr.tr.13 "Infective endocarditis. Pericarditis."

Definition. Aetiology, pathogenesis. Clinical features according to the pathogen. Diagnostic criteria. The role of laboratory and instrumental methods in diagnostic. Differential diagnosis. Complications (heart failure, embolism, abscesses). Evidence-based treatment. Antibacterial therapy regimens. Indications for surgery. Primary and secondary prevention. Prognosis and working-capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks in teams), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital using the stethoscope, the tonometer, instrumental (work with an electrocardiograph, pulse oximeter, ECG data, ultrasound of the heart data, X-ray data) and laboratory methods of examination with further discussion of the results. Application of virtual simulation (watching films about the methodic of ultrasound heart diagnostic). Acquaintance with the methodic of carrying out and interpretation of ultrasound examination of the heart and CT scan of the brain in the departments of the medical institution (according to the agreement of cooperation between the medical institution and the university). Discussing the management strategy and prescription of treatment.

### **Topic 9. Myocarditis. Cardiomyopathies.**

pr.tr.14 "Myocarditis. Cardiomyopathies."

Definition of cardiomyopathies. Classification. Etiology and pathogenesis of main types of cardiomyopathies. The role of laboratory and instrumental methods of investigation in diagnostic. Diagnostic criteria and differential diagnosis. Complications. Evidence-based treatment of different cardiomyopathies. Primary and secondary prevention. Prognosis, working capacity. Definition of myocarditis, classification, clinical features, laboratory and instrumental methods of investigation. Treatment strategy according to the severity and etiological factors. Primary and secondary prevention. Prognosis, working capacity. The study of this topic involves theoretical work in the classroom (testing, situational tasks), training skills in complaints, anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital using the phonendoscope, the tonometer. Application of virtual simulation (watching films about the methodic of echocardiography), instrumental (work with electrocardiograph, pulse oximeter, ECG data, cardiac ultrasound data, X-ray data) and lab methods of examination with further discussion of the results. Discussing the management strategy and prescription of treatment. Acquaintance with the methodic of carrying out and interpretation of X-Ray and ultrasound examination of the heart in the departments of the medical institution

### **Topic 10. Pulmonary embolism (PE).**

lect.6 "Pulmonary embolism."

Pulmonary embolism (PE). Definition and classification of PE. Risk factors. Pathogenesis of hemodynamic disorders. Clinical features of different forms. Diagnostic criteria and differential diagnosis. The diagnostic significance of instrumental methods of investigation. Treatment strategy. Indications for surgical treatment. Primary and secondary prevention. Prognosis and working capacity. Teaching is carried out in the form of a multimedia lecture (in the case of quarantine – in the on-line regime).

pr.tr.15 "Pulmonary embolism (PE)."

Definition and classification of PE. Risk factors. Pathogenesis of hemodynamic disorders. Clinical features of different forms. Diagnostic criteria and differential diagnosis. The diagnostic significance of instrumental methods of investigation.

pr.tr.16 "Treatment of pulmonary embolism."

Evidence-based treatment. Indications for surgical treatment. Primary and secondary prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks in teams), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Work in simulation room with electrocardiograph, pulse oximeter, ECG data, cardiac ultrasound data, X-Ray data). The assessment of laboratory data (D-dimer, INR, APTT) with further discussion of the results. Application of virtual simulation (watching videos about the methodic of CT pulmonary angiography, respiratory support). Discussing the management strategy and prescription of treatment. Performing intravenous injections.

### **Topic 11. Rheumatoid arthritis.**

lect.7 "Joint syndrome. Differential diagnosis and treatment."

Differential diagnosis and treatment of the joint syndrome. Teaching is carried out in the form of a multimedia lecture (in quarantine – in the on-line regime).

pr.tr.17 "Rheumatoid arthritis."

Definition. Etiological factors, pathogenesis. Classification and nomenclature. Clinical features according to the activity of pathological process, stage of the disease, systemic manifestations. Activity evaluation index. The significance of laboratory and instrumental methods in diagnostic of the disease, its stages and activity. Diagnostic criteria. Differential diagnosis. Complications.

pr.tr.18 "Treatment of rheumatoid arthritis."

Evidence-based treatment. Basic therapy. The assessment of the effectiveness of basic therapy. Prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks in teams), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer, questionnaires. Application of virtual simulation (watching videos about the determination of rheumatoid arthritis activity), instrumental (work with X-Ray of joints, densitometry data) and laboratory (using of glucometer, assessment of serological markers) methods of examination with further discussion of the results. Discussing of the management strategy and prescription of treatment with infusomat. Acquaintance with the methodic of carrying out and interpretation of X-Ray and ultrasound examination of joints in the departments of the medical institution (according to the agreement of cooperation between the medical institution and the university).

### **Topic 12. Connective tissue diseases.**



lect.8 "Connective tissue disease."

Teaching is carried out in the form of a multimedia lecture (in the case of quarantine – in the on-line regime).

pr.tr.19 "Systemic lupus erythematosus"

Definition. Etiological factors and pathogenesis. Classification. Clinical features according to the disorders in organs and systems, the assessment of the disease activity. The significance of laboratory, including immunological methods of examination. Diagnostic criteria. Differential diagnosis. Complications. Evidence-based treatment. Pulse therapy. Prevention. Prognosis and working capacity.

pr.tr.20 "Systemic sclerosis and dermatomyositis."

Definition. Etiological factors and pathogenesis. Classification. Clinical features according to the disorders in organs and systems. Diagnostic criteria. Differential diagnosis. Complications. Treatment strategy. Prevention. Prognosis and working-capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks in teams), training skills of complaints and anamnesis data collection, of physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, tonometer, questionnaires, capillaroscope. Application of instrumental (work with X-ray of joints) and laboratory (assessment of serological markers) methods of examination with further discussion of the results. Discussing the management strategy and prescription of treatment with infusomat. Acquaintance with the methodic of carrying out and interpretation of X-Ray and ultrasound examination in the departments of the medical institution.

### **Topic 13. Systemic vasculitis.**

pr.tr.21 "Medium- and large-vessel vasculitis"

Classification of vasculitis. Etiology, pathogenesis, clinic. Diagnostic criteria of giant cell arteritis, Takayasu's arteritis, polyarteritis nodosa. Laboratory and instrumental methods of diagnostic. Differential diagnosis. Evidence-based treatment strategies. Prognosis and working-capacity.

pr.tr.22 "Small-vessel vasculitis"

ANCA-associated and immune complex vasculitis. Clinic. Laboratory and instrumental methods of diagnostic. Differential diagnosis. Evidence-based treatment. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, solving of situational tasks in teams), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer, questionnaires. Application of instrumental (work with chest X-ray) and laboratory (assessment of serological markers, blood analysis, urine dipstick test) methods of examination with further discussing of the results. Virtual simulation (watching the video on punch skin biopsy procedure). Discussing the management strategy and prescription of treatment with infusomat. Acquaintance with the methodic of carrying out and interpretation of CT scans in the departments of the medical institution (according to the agreement of cooperation between the medical institution and the university).

### **Topic 14. Reactive arthritis.**

pr.tr.23 "Reactive arthritis"

Definition. Etiological factors and pathogenesis. Classification. Clinical features according to the etiology. Significance of laboratory and instrumental methods of diagnostic. Diagnostic criteria. Differential diagnosis. Evidence-based treatment, indications for antibacterial therapy. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital using the phonendoscope, the tonometer. Application of instrumental (work with X-ray of joints) and laboratory (assessment of serological markers, blood analysis, urine dipstick test) methods of examination with further discussion of the results. Discussing the management strategy and prescription of treatment.

**Topic 15. Ankylosing spondylitis.**

pr.tr.24 "Ankylosing spondylitis"

Definition. Etiological factors and pathogenesis. Classification. Clinical features. Significance of laboratory and instrumental methods. Diagnostic criteria. Differential diagnosis. Evidence-based treatment. Prevention. Prognosis and working-capacity. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital using the phonendoscope, the tonometer. Application of instrumental (work with X-Ray of joints) and laboratory (assessment of serological markers, blood analysis, urine dipstick test) methods of examination with further discussion of the results. Discussing the management strategy and prescription of treatment. Acquaintance with the methodic of carrying out and interpretation of X-ray and MRI of joints in the departments of the medical institution (according to the agreement of cooperation between the medical institution and the university).

**Topic 16. Psoriatic arthritis.**

pr.tr.25 "Psoriatic arthritis"

Definition. Etiological factors and pathogenesis. Classification. Clinical features. Significance of laboratory and instrumental methods. Diagnostic criteria. Differential diagnosis. Evidence-based treatment. Prevention. Prognosis and working-capacity. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills of complaints and anamnesis data collection, of physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer, assessment scores. Application of instrumental (work with X-ray of joints) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussing of the results. Discussing of the management strategy and prescription of treatment. Acquaintance with the methodic of carrying out and interpretation of X-ray, MRI and ultrasound diagnostic of joints in the units of the medical institution.

**Topic 17. Gout. Osteoarthritis.**

pr.tr.26 "Gout"

Definition of gout. Etiology and pathogenesis. Classification. Clinical features. Diagnostic. Peculiarities of joint syndrome and internal organ damage. Differential diagnosis. Evidence-based treatment. Primary and secondary prevention. Prognosis and working-capacity. Pr 27. Osteoarthritis Definition of osteoarthritis. Aetiology and pathogenesis. Classification. Clinical features. Diagnostic criteria. Differential diagnosis. Complications. Differential treatment strategy. Prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital using the phonendoscope, the tonometer. Application of instrumental (work with X-ray of joints) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. Discussing the management strategy and prescription of treatment. Acquaintance with the methodic of arthrocentesis in the departments of the medical institution (according to the agreement of cooperation between the medical institution and the university) or with the help of virtual simulation.

pr.tr.27 "Osteoarthritis"

Definition of osteoarthritis. Etiology and pathogenesis. Classification. Clinical features. Diagnostic criteria. Differential diagnosis. Complications. Differential evidence-based treatment strategy. Prevention. Prognosis and working-capacity. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital using the phonendoscope, the tonometer. Application of instrumental (work with X-ray of joints) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. Discussing the management strategy and prescription of treatment. Acquaintance with the methodic of arthrocentesis in the departments of the medical institution (according to the agreement of cooperation between the medical institution and the university) or with the help of virtual simulation.

**Topic 18. Glomerulonephritis. Amyloidosis.**

pr.tr.28 "Glomerulonephritis"

Definition of glomerulonephritis. Aetiology, the role of streptococcal infection and immunological disorders in disease development. Pathogenesis of main clinical syndromes. Classification. Clinical features and diagnostic of various forms. Clinical features of nephrotic syndrome. Differential diagnosis.

pr.tr.29 "Glomerulonephritis. Amyloidosis."

Complications (eclampsia, acute and chronic renal failure, and others). Evidence-based treatment according to morphological variant and clinical features. Primary and secondary prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of virtual simulation (watching videos about kidney biopsy), instrumental (assessment the results of kidney biopsy) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. Discussing the management strategy and prescription of treatment.

### **Topic 19. Urinary tract infections: pyelonephritis.**

pr.tr.30 "Urinary tract infections: pyelonephritis"

Definition. The role of streptococcal infection in the development of kidney and urinary tract inflammatory disorders. Primary and secondary pyelonephritis. Clinical features. Instrumental and laboratory methods of diagnostic. Differential diagnosis. Complications. Evidence-based treatment. Primary and secondary prevention. Prognosis and working capacity. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of instrumental (ultrasound interpretation) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results and prescription of treatment. Acquaintance with the methodic of kidneys ultrasound in the departments of a medical institution or with the help of a virtual simulation.

### **Topic 20. Acute kidney injury (AKI).**

pr.tr.31 "Acute kidney injury"

Definition. Etiological factors. Clinical features and changes in laboratory indications. Differential diagnosis between prerenal and renal AKI. Complications. Etiological treatment. Renal replacement therapy, therapy of complications. Contrast-induced nephropathy. Prevention. Prognosis. Definition, etiology and pathogenesis of tubulointerstitial nephritis. Clinical features. Diagnostic criteria and differential diagnosis. Complications. Evidence-based treatment. Emergency in acute kidney injury. Prevention. Prognosis and working-capacity. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results, management strategy and prescription of treatment. Acquaintance with the methodic of hemodialysis in the departments of a medical institution or with the help of a virtual simulation.

### **Topic 21. Chronic kidney disease (CKD). Chronic renal failure.**

pr.tr.32 "Chronic kidney disease"

Definition of CKD. Aetiology, pathogenesis. Classification. Clinical features of different stages of CKD and diagnostic. The definition of chronic renal failure. Etiological factors. Pathogenesis of the disorders of organs and systems, their clinical features. Classification. Clinic and changes in laboratory indicators. Differential diagnosis. Complications.

pr.tr.33 "Treatment of chronic renal failure"

Nephroprotection. Renal replacement therapy. Indications and contraindications for renal replacement therapy, complications. Primary and secondary prevention. Prognosis and working-capacity. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of virtual simulation (watching videos about peritoneal dialysis), instrumental and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. Discussing the management strategy and prescription of treatment. Acquaintance with the methodic of peritoneal dialysis in the nephrological department of the medical institution.

## **Topic 22. Case history presentation.**

pr.tr.34 "Case history presentation"

Case history presentation is based on supervision of the patient with registration of the results of examination, interpretation of preliminary diagnosis, making the plan of examination, interpreting the results of laboratory and instrumental methods of examination, making the differential diagnosis, interpretation of final diagnosis, treatment and recommendation of secondary prevention in each case in accordance with the diagnosed disease of the patient.

## **Topic 23. Organization of therapeutic care in wartime and peacetime emergencies.**

pr.tr.35 "Organization of therapeutic care in wartime and in peacetime emergencies"

General questions of therapeutic care organization in wartime. Characteristic of modern combat therapeutic pathology. Sanitary losses of therapeutic profile. Medical sorting of affected persons at the stages of first qualified and specialized therapeutic care in peacetime emergencies. The study of this topic involves theoretical work in the classroom (discussion of situational tasks in the organization of therapeutic care), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of instrumental (work with X-ray, chest CT scan, ECG) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. The discussion of management strategy.

## **Topic 24. Radiation-related disorders. Clinical characteristic of ionizing radiation. Pathogenesis of radiation sickness. Clinical classification of ionizing radiation, acute radiation sickness. The conception of radiation trauma.**

pr.tr.36 "Radiation-related disorders. Clinical characteristics of ionizing radiation. Pathogenesis of radiation sickness. Clinical classification of ionizing radiation, acute radiation sickness. The conception of radiation trauma."

The critical links of biological effects of ionizing radiation and pathogenesis of the main clinical forms of radiation damage. The clinic, diagnostic and treatment of radiation trauma. The definition of acute radiation sickness. Clinic and diagnostic of different forms of acute radiation sickness. The peculiarities of radiation damage in peacetime The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of instrumental (work with chest CT scans, ECG) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. The discussing of management strategy and emergency care for patients with radiation injuries.

**Topic 25. Acute radiation sickness. Bone marrow form of acute radiation sickness.**

lect.9 "Acute radiation sickness."

Teaching is carried out in the form of a multimedia lecture (in the case of quarantine in on-line regime).

pr.tr.37 "Bone marrow form of acute radiation sickness"

Clinic and diagnostic. Classification of bone marrow form of acute radiation sickness. Clinical features in different periods of sickness.

pr.tr.38 "Differential and diagnostic criteria of degrees of severity of acute radiation sickness"

Differential and diagnostic criteria of degrees of severity of acute radiation sickness. Determination of life-threatening conditions in each period of the disease. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of instrumental (work with chest CT scan, ECG) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. Acquaintance with the methodic of CT scan, ECG in the departments of a medical institution (according to the agreement of cooperation between the medical institution and the university).

**Topic 26. Step therapy of patients with acute radiation sickness. Atypical forms of acute radiation sickness.**

pr.tr.39 "Step therapy of patients with acute radiation sickness. Atypical forms of acute radiation sickness"

The principles of pathogenetic treatment of acute radiation sickness according to the main features. The content of medical care for affected by ionized radiation persons on different steps of medical care. The types of atypical forms of acute radiation sickness. Clinical features of acute radiation sickness in the case of external uneven irradiation, radiation combined injury, internal irradiation, coexistent irradiation, neutron radiation damage, prolonged small doses irradiation. Medical care on different steps of medical evacuation in the case of atypical forms of acute radiation sickness. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of virtual simulation (watching a video with the bone marrow puncture) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. The discussing of management strategy and prescription of treatment.

**Topic 27. Internal organs damage during combat surgical trauma and injuries during peacetime catastrophes and accidents. Complications. Prevention. Treatment.**

pr.tr.40 "Internal organs damage during combat surgical trauma and injuries during peacetime catastrophes and accidents"

Classification of pathological changes of internal organs in wounded persons. Syndromes of gunshot wound. Diseases of respiratory organs in wounded persons. Diseases of circulatory organs in wounded persons. Diseases of digestive organs in wounded persons. Kidney diseases in wounded persons. Evidence-based treatment of internal organs diseases in wounded persons on different steps of medical evacuation. Prevention of internal organs diseases in wounded persons.

pr.tr.41 "Burn disease"

Definition, classification. Pathogenesis of the main clinical features and complications during different periods of diseases. Typical complications of burn disease, diagnostic. Step therapy of burn disease. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care/hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer, pulse oximeter. Work in a simulation class with phantoms for training of medical care during the second step of medical sorting (Safar's triple airway manoeuvre; manual cleaning of the mouth and larynx; cleaning of oropharynx with the aspirator; air duct introduction; performing of artificial respiration, including use a bag valve mask "AMBU"; oxygen inhalation; indirect cardiac massage; defibrillation; stopping of external bleeding (venous, arterial); cervical collar imposition; mobilization of fractures by tires; fixation of the patient on a transport board; applying of bandages). Using of instrumental (work with chest X-ray films, CT scans, ECG) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. The discussing of management strategy and prescription of treatment.

**Topic 28. Emergencies, therapeutic care for life-threatening conditions during different steps of medical evacuation. Poisonous substances injury in wartime and peacetime.**

lect.10 "Poisonous substances injury in wartime and peacetime. Teaching is carried out in the form of a multimedia lecture (in the case of quarantine – in the on-line regime)."

General characteristics of poisonous substances injury, classification, diagnostic. Step treatment of poisonous substances injury in wartime. The organization of emergency therapeutic care in the case of acute poisoning in different steps of medical evacuation. The peculiarities of poisonous substances injury in wartime and in peacetime. The content of evidence-based medical care.

pr.tr.42 "Emergencies, therapeutic care for life-threatening conditions during different steps of medical evacuation. Poisonous substances injury in wartime and peacetime"

General characteristics of poisonous substances injury, classification, diagnostic. Step treatment of poisonous substances injury in wartime. The organization of emergency therapeutic care in the case of acute poisoning in different steps of medical evacuation.

pr.tr.43 "Poisonous substances injury in wartime and in peacetime on chemical factories"

The peculiarities of poisonous substances injury in wartime and in peacetime. The content of evidence-based medical care. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks about the organization of therapeutic care), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer, pulse oximeter. Work in a simulation class with phantoms for training of medical care during the second step of medical sorting (Safar's triple airway manoeuvre; manual cleaning of the mouth and larynx; cleaning of oropharynx with the aspirator; air duct introduction; endotracheal intubation; cricotomy (conicotomy); endotracheal intubation; cricothyroid ligament puncture; tracheostomy; doing of artificial respiration, including using a bag valve mask "AMBU"; oxygen inhalation; indirect cardiac massage; defibrillation). Discussion of management strategy and prescription of treatment.

### **Topic 29. Diseases caused by the action of thermal factors (warm and cold).**

pr.tr.44 "Diseases caused by the action of warm"

Definition of overheating and hypothermia. Changes in internal organs during the influence of warm. Peculiarities of clinic, diagnostic. Prevention and step therapy.

pr.tr.45 "Diseases caused by the action of cold"

Changes in internal organs in cold influence. Peculiarities of clinic, diagnostic. Prevention and evidence-based therapy. The study of this topic involves theoretical work in the classroom (testing, discussion of situational tasks about the organization of therapeutic care), training skills in complaints and anamnesis data collection, physical examination skills in ambulatory care and hospital, or applying of role-playing games in the case of quarantine in the hospital with using of the phonendoscope, the tonometer. Application of instrumental (work with chest CT scan, ECG) and laboratory (assessment of blood analysis, urine dipstick test) methods of examination with further discussion of the results. Discussion of management strategy and prescription of treatment.

### **Topic 30. Practice-oriented exam**



assessm.46 "practice-oriented exam" (full-time course)  
 Evaluation of theoretical answers and practical skills

## 7.2 Learning activities

LA1	Examination of patients at the suitable specialized department.
LA2	The interpretation of instrumental (spirograms, ECG, echocardiography, coronary angiography, X-Ray/CT/ultrasound/MRI of joints, chest, abdomen, endoscopy of GIT) and laboratory results (blood, sputum, urine, bone marrow).
LA3	E-learning on platforms (MIX.sumdu.edu.ua).
LA4	Writing and defense of case history.
LA5	Solving of situational clinical tasks.
LA6	Preparing to practice-oriented exam.
LA7	Preparing presentation and reporting.
LA8	Watching training videos.
LA9	Working with books and relevant information resources
LA10	Self-study.
LA11	Individual research project (student research project, thesis, article)
LA12	Preparing to KROK-2.

## 8. Teaching methods

Course involves learning through:

TM1	Interactive lectures.
TM2	Case-based learning (CBL)
TM3	Brain storm.
TM4	Role playing
TM5	Study discussion.
TM6	Team-based learning (TBL)
TM7	Research-based learning (RBL)

The discipline is taught using advanced teaching methods that contribute to developing professional skills aimed at training practice-oriented specialists and stimulating scientific activity.

Ability to abstract thinking, analysis and synthesis. Ability to learn and master modern knowledge, applying it in practice. Knowledge and understanding of the subject area and professional activity comprehension. Ability to adapt and act in a new situation. Ability to make reasonable decisions; work in a team; skills in interpersonal relationship. Ability to use information and communication technologies. Determination and persistence to the tasks and commitments undertaken.

## 9. Methods and criteria for assessment

### 9.1. Assessment criteria

ECTS	Definition	National scale	Rating scale
	Outstanding performance without errors	5 (Excellent)	$170 \leq RD \leq 200$
	Above the average standard but with minor errors	4 (Good)	$140 \leq RD < 169$
	Fair but with significant shortcomings	3 (Satisfactory)	$120 \leq RD < 139$
	Fail – some more work required before the credit can be awarded	2 (Fail)	$0 \leq RD < 119$

### 9.2 Formative assessment

FA1	Defense of case history
FA2	Teacher's instructions in the process of performing practical and situational tasks
FA3	Questionnaire and oral comments of the teacher based on the results of survey.
FA4	Assessment of written tasks
FA5	Testing
FA6	Peer assessment
FA7	Defense of individual research project (report on the student's scientific conference or scientific work contest)

### 9.3 Summative assessment

SA1	Evaluation of written tasks, questionnaire, solving of situational case
SA2	Defense of case history
SA3	Final evaluation: practice-oriented exam
SA4	Defense of individual research project (encouragement points)

Form of assessment:

<b>9 semester</b>	<b>200 scores</b>
SA1. Evaluation of written tasks, questionnaire, solving of situational case	<b>120</b>
Answering the questions, situational tasks solving	110
Case history writing and presentation	10
SA3. Final evaluation: practice-oriented exam	<b>80</b>
Evaluation of theoretical answers	60
Evaluation of practical skills	20

Form of assessment (special cases):

<b>9 semester</b>	<b>200 scores</b>
SA1. Evaluation of written tasks, questionnaire, solving of situational case	<b>120</b>

	In particular situations and limitation practical classes must be conducted distantly using such platforms as Mix.sumdu.edu.ua, Google meet.	110
	In special situation and limitation case history writing and presentation must be conducted distantly using such platforms as Mix.sumdu.edu.ua, Google meet	10
SA3. Final evaluation: practice-oriented exam		<b>80</b>
	In special situation and limitation assessment of theoretical and practical skills must be conducted distantly using such platforms as Mix.sumdu.edu.ua, Google meet	80

Total mark of discipline is defined as the summarizing of points for current educational activities (not less than 72) and points for exam (not less than 48). General mark of the discipline must be not more than 200. The calculation of the number of points for the current performance is based on the student's marks on the traditional 4-point rating scale by arithmetic mean calculating. The resulting value is converted into points by the formula: 110 multiplied by the arithmetic mean and divided by 5. The following marks for case history writing are: "5" - 5 points, "4" - 4 points, "3" - 3 points, "2" - 0 points. The following marks for case history presentation are: "5" - 5 points, "4" - 4 points, "3" - 3 points, "2" - 0 points. In general, for case history student can get the maximum of 10 points, the minimum required score is 6. The maximum number of points for the current educational activities of the student - 120. The final assessment of the discipline is an exam done at the end of the study semester according to the schedule completed by the dean's office of the medical institute. Students who have a current educational score of at least 72 points (66.0 points during practical classes and 6.0 points for case history), who have not missed lectures and practical classes, who have defended their medical history are admitted to the exam. The exam consists of 4 theoretical questions, each is graded at 9, 12 or 15 points, which corresponds to the traditional 4-point system "3", "4" or "5" respectively. The practical question is evaluated in 12, 16 or 20 points, which corresponds to the traditional 4-point system "3", "4" or "5". Having summarized all the points for 5 questions, the exam is credited to the student if he scored at least 48 points out of 80 possible. Incentive points are added: for a prize place in the 2nd tour of the student's Olympiad or a prize place in the competition of student research work -12 points; for participation in students' scientific forum in oral report form - 5 points; in poster form - 4 points; in the case of abstract publication - 3 points; for selection of audio or video material from sections of the discipline - 2 points; for writing an abstract, video reports with literature review connected with problematic issues according to topics of modules 1 point (1 point for 1 presentation, the maximum quantity of presentations is 4). The recalculation of the results obtained in non-formal education is carried out on a voluntary basis and provides confirmation that the applicant has achieved the learning outcomes provided by the educational-professional program.

## 10. Learning resources

### 10.1 Material and technical support

MTS1	Information and communication systems
MTS2	Library fund, archive of radiographs, spiograms, electrocardiograms, coronary angiograms, computed tomograms, results of laboratory methods of examination

MTS3	Medical facilities / premises and equipment (Municipal Non-Commercial Enterprise of Sumy Regional Council "Sumy Regional Clinical Hospital", "Sumy Clinical Cardiology Dispensary", "Clinical hospital St.Panteleymon", "Clinical hospital № 4", "Clinical hospital № 5")
MTS4	Computers, computer systems and networks
MTS5	Medical equipment (spirometer, peakflowmeter, electrocardiograph, height meter, scales, tonometer, fibrogastroscope, phonendoscope, capillaroscope, glucometer, infusomat)
MTS6	Software (to support the distance learning, online surveys, virtual laboratories, virtual patients, to create computer graphics, etc.)
MTS7	Multimedia, video and audio, projection equipment (video cameras, projectors, screens, smart boards, etc.)

## 10.2 Information and methodical support

<b>Essential Reading</b>	
1	Goldman-Cecil medicine [Текст]. V.1 / L. Goldman, L. Schafer, M. Crow etc. —25-th ed. — Saunders: Saunders Elsevier, 2016. — 1489 p.
2	Goldman-Cecil medicine [Текст]. V.2 / L. Goldman, L. Schafer, M. Crow etc. —25-th ed. — Saunders: Saunders Elsevier, 2016. — 1129 p
3	USMLE Step 2 CK: Internal Medicine [Текст]: Lecture Notes / Editors J.J. Lieber, F.P. Noto. — New York: Kaplan, 2019. — 503 p.
4	Internal Medicine [Электронный ресурс] : An Illustrated Radiological Guide / J. A. Al-Tubaikh ; by Jarrah Ali Al-Tubaikh. — 2nd ed. 2017. — Cham : Springer International Publishing, 2017. — XVI, 592 p.
5	Skills in Rheumatology [Электронный ресурс] / ed.: H. Almoallim, M. Cheikh.— Singapore: Springer, 2021. — 566 p.
<b>Supplemental Reading</b>	
1	Integrative Cardiology [Электронный ресурс] : A New Therapeutic Vision / edited by Massimo Fioranelli. – 1st ed. 2017. – Cham: Springer International Publishing, 2017. – XII, 276 p.
2	Cardiology Procedures [Электронный ресурс]: A Clinical Primer / edited by Robert C. Hendel, Carey Kimmelstiel. – 1st ed. 2017. – London: Springer London, 2017. – XI, 347 p.
3	Macleod’s Clinical Examination. 13th Edition // Edited from Graham Douglas, Fiona Nicol, Colin Robectson. – Publisher: London Elsevier Health Sciences UK, 2013. – Pages: 472.
4	Braunwald’s heart disease: A textbook of cardiovascular medicine, 2-Volume Set 10th Edition. International edition. // by Douglas L. Mann, Douglas P. Zipes, Peter Libby, Robert O. Bonow. – Publisher: Elsevier, 2015. – 2136 pages.
5	Internal Medicine: Critical Care: textbook (III-IV a.l.) / O.Ya. Babak, O.M. Bilovol, N.M. Zhelezniakova et al.; edited by O.Ya. Babak, O.M. Bilovol. – К.: Медицина, 2018. – 368с.

6	Pogorielova, O. S. Acute coronary syndrome [Текст] : study guide / O. S. Pogorielova. — Sumy : Sumy State University, 2021. — 73 p.
7	O.M. Chernatska, L.N. Prystupa, H.A. Fadieieva, A.V. liashenko, Y.O. Smiianova Arterial hypertension, associated with hyperuricemia: features of heart damage // J. Wiadomosci Lekarskie (Польша). – 2020. – tom LXXIII, № 5. – P. 943-946.
<b>Web-based and electronic resources</b>	
1	<a href="https://empendium.com/mcmtextbook/">https://empendium.com/mcmtextbook/</a>
2	<a href="https://www.mdcalc.com/">https://www.mdcalc.com/</a>
3	<a href="https://reference.medscape.com/guide/medical-calculators">https://reference.medscape.com/guide/medical-calculators</a>
4	<a href="https://cprguidelines.eu/">https://cprguidelines.eu/</a>
5	<a href="https://www.escardio.org/Education/E-Learning/basic-tools-in-general-cardiology">https://www.escardio.org/Education/E-Learning/basic-tools-in-general-cardiology</a>