THE FACULTY MEDICINE NR. 1
STUDY PROGRAM 0912.1 MEDICINE
DISCIPLINE OF CARDIOLOGY

APPROVED
at the meeting of the Commission for Quality Assurance and Evaluation of the Curriculum in Medicine no.1
Minutes No. 7 of 17.06.24
Chairman MD, PhD,
(academic degree, scientific title)
Andrei Padure _____
(signature)

APPROVED
at the Council meeting of the Faculty of Medicine no.1 _____
Minutes No. 10 of 18.06.24
Dean of the Faculty, MD, PhD, Professor
(teaching degree, scientific title)
Gheorghe Plăcintă _____
(signature)

APPROVED
at the meeting of the Discipline of Cardiology
Minutes No.13, from 23.05.2024
Head of the Cardiology subdivision MD PhD,
Professor Livi Grib _____
(signature)

FACULTY OF MEDICINE
STUDY PROGRAM 0912.1 MEDICINE
DISCIPLINE OF CARDIOLOGY

Integrated studies
Type of course: **obligatory course**

Prepared by

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I. PRELIMINARIES.

General presentation of the Discipline: place and role of the Discipline in the formation of the specific competences of the vocational / specialty training program.

The Cardiology course in fourth year presents an important component of clinical education and aims to study cardiovascular diseases (incidence, etiopathogenesis, clinical manifestations, clinic and differential diagnosis, treatment, prophylaxis and prognosis) based on contemporany scientific achievements in cardiology, as well as in other fields (biology, genetics, physics, chemistry, immunology, biochemistry, physiology, patomorphology, pharmacology, internal medicine and other sciences); using various methods of investigation (didactic, clinical, laboratory, instrumental, functional, morphological, hormonal, biochemical, radio-immunological, etc.).

The content of the course is well structured and includes the clinico-functional principle of the functional and morphological disturbances assessing in the cardiovascular system, which constitutes the methodological basis of the object and provides the connection and interrelations of cardiology with other fundamental and clinical disciplines (anatomy, physiology and pathophysiology, biochemistry, morphopathology, pharmacology, internal medicine, neurology, dermatovenerology, surgery, obstetrics and gynecology, etc.).

Mission of the curriculum (aim) in vocational training

- One of the main objectives of the course is to study the etiology, pathogenesis, clinical manifestations (and only atypical variants) of cardiovascular disease.
- The second objective is to enrich and deepen the fundamental knowledges (obtained in the years of previous studies) and their implementation in clinical practice.
- The third objective is to assimilate and to develop the method of clinical judgment: to assess the results of the clinical examination of the patients with cardiological pathology, to justify the presumptive diagnosis, to draw up and to justify the paraclinical investigation program and other specialized doctors consultations, to perform the differential diagnosis within the studied diseases, (clinical) diagnosis and the reasoning of an appropriate treatment, the prognosis of the pathology established evolution in the concerned patients.
- A special role is considered due to the consolidation and completion of the practical skills (obtained during the semiology) in the clinical examination conducting of the patients as well as the enrichment and the knowledge implementation in clinical practice in the field of medical deontology and ethics.

Languages of the subject: Romanian, Russian, English, French

Beneficiaries: IV year students, Faculty of Medicine 1 and 2, Speciality Medicine

II. ADMINISTRATION OF THE DISCIPLINE

Code of Discipline		**S.08.O.066.**	
Name of the Discipline		**Cardiology**	
Responsible (s) of Discipline		MD. PhD, Professor **Livi Grib**	
The year	**IV**	Semesters	**VIII**
Total hours including:			**180**
Course	**40**	Practical work	**40**
Seminars	**40**	Individual work	**60**
Evaluation form	**E**	Number of credits	**6**

III. THE OBJECTIVES OF THE FORMATION IN CARDIOLOGY DISCIPLINE

The level of knowledges and understanding

The student must know the theoretical bases of the cardiology (within the limits of nosologic entities studied in the IV year after the analytical program):

- definition of the disease;
- incidence and epidemiology;
- etiology;
- risk factors;
- pathogenesis;
- clinical manifestations and methods of investigation;
- symptoms, signs, clinical syndromes (in the order required by the examination of the patient), the data of laboratory and instrumental examination (noninvasive and invasive), mechanisms (pathogenesis) of symptoms, syndromes and changes found at the laboratory and instrumental examination;
- the particuliarities of the clinical and paraclinical examination of the patient with pathology;
- the classification proposed by OMS experts, other classifications; criteria for classification, peculiarities of clinical manifestations for every form of/stage/degree/classification;
- clinical variants, atypical forms and their characterization;
- peculiarities of the pathology in elderly persons, ethylic persons, drugmen, compromised immunity persons;
- the evolution of the disease;
- complications and their manifestations, mechanisms and the circumstances of their appearence;
- any emergency status: clinics, the causes and mechanisms of installation;
- positive diagnosis: diagnostic criteria, diagnostic algorithms;
- differential diagnosis list and criteria of differentiation;
- the formulation of requirements;
- treatment: indications for hospitalization, physical arrangements, food and diet, treatment of the etiological and treatment tactics in case of unidentified etiology, symptomatic and pathogenetic treatment, (drugs, dosages, method of administration, mechanisms of action, side effects and their prevention, contraindications, the duration of treatment); traditional methods of treatment (general principles), physical methods (principles of action, indications, and contraindications); the algorithm of treatment in emergency states. In chronic diseases: treatment in aggravation phase, maintenance treatment in remission period. Surgical treatment (general principles, indications, contraindications). Balneo-sanatorial treatment (balneo-sanatorial methods, natural curative factors, indications, contraindications);
- Recovery (stages, methods);
- Prognosis for life;
- Primary and secondary disease prevention (chronic diseases-acutization and/or complications).

Application level

The student must independently carry out:

- interviewing of the patients, anamnesis collecting with data and assessment to demonstrate empathy towards patients, compliance with the principles of medical ethics and deontology;
- complete clinical examination of patients with findings in the context of clinical reasoning of all signs and syndromes;
- argumentation of presumptive diagnosis;
- preparing and motivation of laboratory investigations and consultations of other doctors-specialists;
- clinical assessment of the results of laboratory and instrumental investigations to examine patients;
- differential diagnosis within the studied diseases;
- the formulation of diagnosis (clinical) specifically;
- argumentation of appropriate prescribing of drugs from the main groups;
- forecasting the evolution of pathology-established patients;
- preparation and drafting of the observation file for the patients with the studied diseases.

At the level of integration

The student must demonstrate the ability to integrate into the process of clinical reasoning and knowledge acquired in the corresponding specialization of previous studies (I-III) and appropriated necessity of internal medicine, diagnosing of the diseseases and treatment prescribing;

- skills in educating patients on health care in prevention of diseases, recurrences and complications;
- ability to develop and implement research projects in the new field.

IV. CONDITIONS AND PRIOR REQUIREMENTS

Cardiology is one of the basic disciplines in university physicians training that doesn't depends on the specialty that a student will choose later, that includes large group of fundamental knowledges integration and implementation (anatomy, human physiology, pathophysiology, semiology, biochemistry, pharmacology, morphological anatomy, etc.) in clinical practice. Within this discipline, the study of the etiology, pathogenesis, clinical manifestations, evolution, treatment and prevention of cardiovascular disease more common, practical skills specialist accumulates investigating patient and assessing the obtained results, based on clinical reasoning, which ensures a correct diagnosis and adequate treatment.

Student of the fourth year requires the following:

- knowledging of the language of instruction;
- preclinical skills
- clinical skills
- digital skills (using of the internet, document processing, electronic tables and presentations, using of software graphics);
- ability to communicate and teamwork;
- ability to communicate with patients

- qualities - intelligence, wisdom, tolerance, compassion, autonomy.

V. TIME TABLE AND ORIENTAL DISTRIBUTION OF HOURS

Nr.	THE NAME OF THE TOPIC	Number of the hours			
		C	S	PL	P/I
1.	Noninvasive and invasive cardiovascular explorations.	2	2	2	4
2.	Cardiovascular risk factors. Preventive cardiology.	2	2	2	2
3.	Atherosclerosis. Dyslipidemias.	2	2	2	4
4.	Artherial Hypertension.	2	2	2	2
5.	Hypertensive urgency	2	2	2	4
6.	Ischemic Heart Disease. Stable Angyna Pectoris	2	2	2	2
7.	Acute Coronarian Syndrome. Unstable Angyna Pectoris. NSTEMI.	2	4	2	4
8.	Acute Miocardial Infarction and it's complications, treatment.	4	4	2	6
9.	Cardiac arrytmias.	2	2	4	5
10.	Conductibility disturbances. Syncopa.	2	2	4	5
11.	Acquired Valvular Heart diseases.	4	4	2	4
12.	Infectious Endocarditis	2	2	2	2
13.	Primary and secondary Diseases of Pericardium.	2	2	2	2
14.	Miocarditis	2	2	2	2
15.	Cardiomiopathy	2	2	2	2
16.	Acute and chronic Heart Failure.	4	2	4	4
17.	Reabilitation of the cardiovascular patients.	2	2	2	4
	Total	**40**	**40**	**40**	**60**
	Total		**180**		

VI. PRACTICAL SKILLS ACQUIRED AT THE END OF THE COURSE

Essential practical tasks are:

- Examination of a patient with cardiovascular disease.
- Inspection of the precordial region, carotid vessels, abdominal aortic vessels, lower limb vessels.
- Assessment of the pulse at the peripheral arteries (radial, carotid, femoral, the dorsalis pedis artery)
- Measurement of blood pressure in the upper and lower extremities.
- Heart palpation and percussion.
- Auscultation of the heart (appreciation of sound I, sound II, additional sounds, systolic and diastolic murmurs).
- Auscultation of carotid vessels, abdominal aorta, renal arteries and femoral arteries.
- Interpretation of paraclinical examination results in patients with cardiovascular pathology (EKG, EchoCG, chest radiography, blood count, urine analysis, biochemical analysis, markers of myocyte injury, markers of inflammation)

- Examination of a patient with cardiovascular pathology, detection of the main syndromes, argumentation of the diagnosis based on the clinical examination and the results of the investigations.
- Formulation of the management algorithm in cardiovascular diseases (diagnostis and therapeutic measures)
- Presentation of the necessary investigations in the order of priorities specifying the expected results for argumentation of the diagnosis in a patient with cardiovascular disease (ichaemic heart disease: stable angina, unstable angina, myocardial infarction; arterial hypertension, valvulopathies, myocarditis, cardiomyopathies, pericarditis, infectious endocarditis, arrhythmias and heart conductivity disorders, etc.).
- Recording and interpretation of the normal electrocardiogram (correct placement of electrodes, safety and hygiene rules)
- Interpretation of EKG in arrhythmias and heart conductivity disorders: sinus tachycardia and bradycardia, supraventricular tachycardia, ventricular tachycardia, atrial fibrillation and flutter, ventricular fibrillation and flutter, sinoatrial and atrioventricular blocks, left and right bundle branch blocks.
- Interpretation of EKG in acute myocardial infarction (anterior extended, lateral, inferior, posterior).
- Interpretation of EKG in myocarditis, cardiomyopathies, exudative and fibrinous pericarditis, valvulopathies.
- Indications, contraindications and interpretation of the results of stress test EKG: Cycloergometry, Treadmill - test.
- Long-term monitoring (for 24 hours) of EKG and blood pressure (Holter): indications and interpretation of results.
- Doppler echocardiographic examination (EcoCG) in patients with cardiovascular pathology: indications and interpretation of results.
- Electrophysiological examination of the heart, indications.
- Ultrasonographic examination of the main vessels and intima media Doppler in patients with cardiovascular pathology: indications, interpretation.
- Radiological examination in cardiac patients: chest radiography, ventriculography, cardiac catheterization: indications and contraindications, enumeration of elementary radiological changes and main radiological syndromes in heart pathology.
- Angiographic examination and coronary angiography in cardiac patients, the diagnostis and therapeutic role of these investigations.
- Interpretation of imaging results of the heart (exploration with radionuclides, myocardial perfusion scintigraphy with radiopharmaceuticals , computed tomography and positron emission tomography, nuclear magnetic resonance) in various cardiac pathologies.

- Interpretation of myocyte injury markers (troponins I and T, creatinine phosphokinase fraction MB, myosin, lactate dehydrogenase) in the patient with acute coronary syndrome.
- Importance and interpretation of inflammation markers (C-reactive protein, circulating immune complexes, IL-1, IL-6 interleukins, hemogram) in patients with cardiovascular pathologies.
- Indications and interpretation of markers of oxidative stress (low density lipoproteins, myeloperoxidase), neurohormones (adrenaline, norepinephrine, angiotensin II, renin, aldosterone, vasopressin, endothelin), extracellular stress markers (natriuretic peptide) , collagen propeptides) in patients with cardiovascular disease.
- Interpretation of the lipidogram (total cholesterol, triglycerides, LDL, HDL fractions) in healthy patients and those with heart disease.
- The importance of the assessment of coagulation markers (prothrombin, INR, fibrinogen, coagulation time) and their interpretation in patients with prosthetic valves.
- Importance of liver markers (transaminases (ALT, AST), bilirubin), kidney markers (urea, creatinine, functional kidney markers), markers of purine metabolism (uric acid) and ionogram in patients with heart failure.
- Control of diuresis / fluid used for 24 hours in patients with chronic heart failure.
- Assessment of body mass index and waist circumference of the patient with heart disease.
- Evaluation of cardiovascular risk factors according to the SCORE system in a cardiac patient.
- Writing the observation paper of a patient with cardiovascular pathology.
- Prescribing some drugs from the main groups: hypotensive, antiarrhythmic, antianginal medication.
- How to use nitroglycerin (pills and spray) in angina pectoris and acute myocardial infarction.
- How to use captopril in the hypertensive crisis.
- The technique of vagal maneuvers in supraventricular tachycardia.
- Electrocardiostimulation methods, types of pacemakers.
- Knowledge of the emergency medical care protocol in hypertensive crisis, angina pectoris, acute myocardial infarction, pulmonary edema and cardiogenic shock.
- Prescribing the diet for one day to a patient with cardiovascular pathology.

VII. REFERENCE OBJECTIVES AND CONTENTS UNITS

Objectives	Contents units
Chapter 1. Cardiovascular noninvasive and invasive explorations.	
• to define the biomarchers used in cardiology • to define investigations used in cardiology for the diagnosis of cardiovascular pathologies • to be familiar with the biomarchers classification • to be familiar with the equipment used for the EKG	• Biomarkers, components of biological products (blood, urine, tissue), or instumentali (ECG, EcoCG, CT, etc.). • Normal resting electrocardiogram. • The normal EKG interpretation and in

Objectives	Contents units
EKG, Holter monitoring, cicloergometria, Tredmill echocardiography test. • to be able to record an ECG • to know to describe a normal ECG and in pathologies. • to know the indications and contraindications for the effort EKG test, pharmacological tests, chest x-ray, coronaroangiografiei, schintigrafiei, CT and perfusion cardiac MRI. • to interpretate the echocardiography, effort test, Holter-ECG monitor and blood pressure, chest x-ray • to know the normes of the biomarchers in a patient with cardiovascular pathology for argumentating and establishing of the clinical diagnosis • to comment the clinical medical significance of the biomarchers in cardiovascular pathologies • to apply the knowledges acquired from other studies regarding biomarchers used in cardiology • to formulate conclusions and interpretation of the biomarchers results • to develop their own opinions regarding the role of biomarcherilor in cardiac pathology identification	cardiovascular diseases: acute coronary syndrome, rhythm disturbances or conduction of electrical anomalies with genetic substrate. • Echocardiography, EKG with effort, indications and contra-indications of pharmacological Tests, indications and contra-indications. • Chest x-ray,. • Coronaroangiography, indications and contra-indications. • Aortoangiography, indications and contra-indications. • Schintigraphy infusion, Cardiac CT, indications and contra-indications. • Cardiac MRI, indications and contra-indications. • Holter ECG monitoring and blood pressure, indications
Chapter 2. Preventive cardiology. Cardiovascular risc factors. Atherosclerosis. Dislipidemia.	
• To define the primary and secondary prophylaxis and their importance in integrative cardiovascular pathologies • to know the risk factors; • to know the normal values of blood lipids • to know the stages of atherosclerosis development. • to calculate the cardiovascular risk using the SCORE score and to propose a plan for it's reducing. • to calculate body mass index and to assess the degree of obesity. • to demonstrate the importance of a healthy life style in dislipidemy prophylaxis and to apply it in daily life • to prescribe hipolipemiant drugs from different classes in patients with Dyslipidemia. • to apply the knowledges gained in this field fot the future for other disciplines.	• Primary and secondary prophylaxis. • Lipid and non-lipid risk factors, classical and new. • Dislipidemias. Definitions. • Blood lipids. Fatty acids. Triglycerides. • Phospholipids. Cholesterol. Apoproteins. • Lipoproteins. • Enzymes involved in lipid metabolism. Receptors for high-density lipoprotein. • Lipoprotein metabolism. • Dyslipidemia as risk factor for ischemic heart disease. • Dislipidemia and atherosclerosis. • Etiopathogenesis of dyslipidemias. • Classification of hiperlipoproteinemias. Diagnostics, treatment and prevention of hiperlipoproteinemias. • Non-medical and medical treatment.

Chapter 3. Ischemic Heart Disease. Stable Angina. Acute Coronary Syndrome. Acute Miocardic Infarction. Cardiopulmonary and cerebral resuscitation. Sudden cardiac death.	
• to define ischemic heart disease and it's forms • to define non-modificable and modifiable risk factors, , and their significance for ischemic heart disease installation • be know the classification of ischemic heart disease, acute coronary syndrome, angina pectoris, acute myocardial infarction, • to know the coronary circulation and the heart inervation, types of the vascularization. • to understand the pathogenesis of atherosclerosis in ischemic heart disease development • to know the clinical manifestations of the patient with stable angina, unstable angina, microvascular angina, acute myocardial infarction. • to interpretate the ECG modifications in stable angina, unstable angina, microvascular angina, silent angina, acute myocardial infarction NSTEMI and STEMI. • to know the algorithm for the diagnosis establishing in case of unstable angina, acute miocardial infarction NSTEMI and STEMI. • to understand the utilitaty of the GRACE, TIMI, SINTAX, EUROSCORE II scores in unstable angina pectoris and NSTEMI for the treatment tactics decision. • to prescribe the diet for the patients with stable angina and acute myocardial infarction. • to prescribe the drugs of the I and II line for the patients with angina and acute miocardial infarction in different stages. • to know the types of revascularisation, oportun moment, using of the drugs and effectuated procedures. • to know the complications of acute myocardial infarction and their tactics of treatment • to know the stages of rehabilitation of the patient with various forms of angina pectoris and acute myocardial infarction. • to definate the sudden death and it's prophylaxis. • to demonstrate the ability of cardiac resuscitation effectuating • to know the criteria for vital indices restablishing.	• Coronary circulation. Definitions. • Classification. • Structure of atherosclerotic lesions. • Pathogenesis of atherosclerosis. • Clinical mechanisms of ischemic heart disease. • Risk factors and prevention. • Stable angina. • Acute coronary syndrome. • Unstable angina. • Vasospastic angina. • Microvascular angina. • Angina pectoris treatment. • Revascularization in angina pectoris. • Acute myocardial infarction without ST segment elevation. • Acute myocardial infarction associated with ST segment elevation. • The clinical manifestations: Laboratory investigations. Early complications. Late complications. AMI treatment. • Treatment of reperfusion. • Additional treatment methods. • AMI treatment without ST elevation. Postinfarct of miocardium treatment. • Sudden death. • Cardiopulmonary and cerebral resuscitation (CUSIM). • The criteria for the stabilizing of the vital indexes. • Transportation and hospitalization of the revived patient. • Postresuscitation syndrome management.
Chapter 4. Arterial Hypertension. Hypertensive urgences.	
• to define hypertension • to know the target values of blood pressure in healthy people and different groups of patients (young, elderly, pregnant women, diabetics, patients with ischemic heart disease, arrhythmias, cardiac blocks,	• Definition of hypertension. • Classification of hypertension. • Pathogenesis of hypertension. • Clinical examenation in hypertension.

heart failure, etc) • to know the hypertension classification • to understand physiopatological mechanism and risk factors of hypertension. • to be familiar with the clinical picture of the patient with hypertension. • to be familiar with subclinical damage target organs in hypertension. • to know and calculate the additional risk in patients with hypertension using standartizate chart. • to understand the importance of primary and secondary preventinin in hypertension • to demonstrate agile in diet selection and regime of patients with hypertension . • be familiar with the antihypertensiv medications, doses and effects. • to demonstrate the ability to prescribe the medication treatment in patients with special forms of hypertension (young people, the elderly, pregnant women, diabetics ischemic heart disease, cardiac arrhythmias, cardiac blocks, heart failure, etc..). • to define hypertensive emergencies: common and extreme (major vital risk). • to know classification of hypertensive emergencies. • to have a skills to prescribe the treatment in accelerated hypertension (malignant) with papilloedema, complicated with acute left ventricular failure, with acute myocardial infarction or unstable angina, with dissection of the aorta, cerebral hemorrhagy or sroke, in preeclampsia, eclampsia, in the perioperative patients and acute crisis of pheochromocytoma in drugs usage, and in renal failure.	• Paraclinical examinations in patients with hypertension. • Subclinical manifestations of the target organs in hypertension. • Hypertensive emergencies. • Hypertensive emergency common and extreme (major vital risk). • Accelerated hypertension (malignant) with papilledema. • Acute hypertensive left ventricular failure. • Acute hypertensive encephalopathy Hypertension associated with acute myocardial infarction, unstable angina, acute dissection of aorta, subarachnoid hemorrhage or stroke. • Hypertension in preeclampsia and eclampsia. • Perioperative hypertension. • Hypertension in the crisis of pheochromocytoma, in drugs usage, acute or chronic renal failure.
Chapter 5. Arrhythmias and conductibility disorders	
• to define cardiac arrhythmias and blocks • to know electrophysiological mechanisms of arrhythmias • to know the classification of arrhythmias and cardiac blocks • to understand trigger and re-entry mechanism of arrhythmias. • to be able to analize the ECG with arrhythmias and blocks: tachycardia, sinus bradycardia, sinus arrhythmia, extrasistolias, jonctionale paroxysmal supraventricular tachycardia, atrial fibrillation and flutter, ventricular tachycardia, ventricular fibrillation and flutter, sinoatrial block II, III degree, atrioventricular block I, II, III degree, right and left bundle branch block of Hiss, WPW Syndrome. • to be familiar with antiaritmic agents and their	• Cardiac arrhythmias. • Electrophysiologic mechanisms of aritmogenesis. • Sinus tachycardia. • Sinus bradycardia. Sinus arrhythmia. • Extrasistolias, joncţionale, ventricular and atrial. • Paroxysmal supraventricular tachycardia. Treatment and prevention of paroxismal supraventricular tachycardia. • Atrioventricular nodal reentrant tachycardia. Atrial tachycardias. Atrial fibrillation and flutter. • Treatment of paroxysmal atrial

• to be able to perform Valsalva and Muller method for restoring paroxysm of supraventricular tachycardia. • to be able to appreciate the radial artery, carotid, cubital, femoral, dorsalis pedis pulse. • to calculate pulse deficit in patients with atrial fibrillation • to prescribe treatment in patients with arrhythmias: sinus tachycardia, sinus bradycardia, sinus arrhythmia, atrial extrasistolias, jonctionale and ventricular tachycardia, paroxysmal supraventricular, atrial flutter, atrial fibrillation, ventricular tachycardia. • to know how to perform pharmacological and electric cardioversion, defibrilation. • to know the particularitis of cardiac defibrillation and electrical stimulation implantation. • to be familiar with the definition and classification of the syncope.	• Treatment of ventricular tachycardia, flutter and ventricular fibrillation. • Conductibility disorders. • Sinoatrial and atrioventricular blocks. Intraventricular conduction disorders. • Right bundle branch block. • Left bundle branch block. • Syndrome of ventricular preexcitation • Antiarrtytmics drugs. • Syncopes nervous mediated. • Cardiac syncope.

Chapter 6. Acquired Valvular Heart Diseases. Mitral, aortic, tricuspide and pulmonary artery Valvular Diseases.

• to define valvular heart diseases. • be familiar with the classification of valvular heart diseases. • to understand blood circulation and hemodynamics in normal heart and physiopathology in valvulopathy. • demonstrate knowledge in symptoms, signs and diagnosis in mitral stenosis and regurgitation, mitral valve prolapse, aortic stenosis and regurgitation, tricuspid stenosis and regurgitation, tricuspid stenosis and pulmonary artery regurgitation. • to appreciate by percussion the heart limits in valvular diseases (CUSIM) • to differentiate by auscultation cardiac sounds and murmurs in valvular diseases (CUSIM) • to know to appreciate the characteristic signs at to define valvular heart diseases. • be familiar with the classification of valvular heart diseases. • to understand blood circulation and hemodynamics in normal heart and physiopathology in valvulopathy. • to demonstrate knowledge in symptoms, signs and diagnosis in mitral stenosis and regurgitation, mitral valve prolapse, aortic stenosis and regurgitation, tricuspid stenosis and regurgitation, tricuspid stenosis and pulmonary artery regurgitation. • to appreciate by percussion the heart limits in valvular diseases • to differentiate by auscultation cardiac sounds and murmurs in valvular diseases	• Valvular heart diseases. Definition. Classification. • Mitral stenosis. Hemodynamics. The clinical picture. Diagnosis. Complications in mitral stenosis. Differential diagnosis. Pharmacological and surgical treatment of mitral stenosis. • Mitral regurgitation. Hemodynamics. The clinical picture. Diagnosis. Complications.. Differential diagnosis. Pharmacological and surgical treatment. Mitral valvular prolapse. • Aortic stenosis. Hemodinamics. The clinical picture. Diagnosis. Differential diagnosis. Complications. Treatment of aortic stenosis. Surgical treatment. • Aortic regurgitataion. Hemodynamics. The clinical picture. Diagnosis. Differential diagnosis. Complications. Pharmacological and surgical treatment of aortic regurgitation. • Tricuspid stenosis and regurgitation. • Pulmonary regurgitation. Artificial valve choice and management of patients.

patients with valvular heart diseases: acrocianosis, "facies mitralis", distention of jugular veins, carotid „dance", Alfred de Musset and Qwinke by physical examination. can analize the results of laboratory tests in valvular diseases. • to be familiar with the possible complications in valvulopathy. • to formulate diagnoses into different valvular heart diseases. • to prescribe a diet in patients with valvular heart diseases. • to prescribe medication to patients with valvulopathy in accordance with national clinical protocols. • be familiar with the choice of artificial valve for surgical treatment in patients with valvular heart diseases, surveillance of patient after valve replasment. • to calculate the surgical risk according EUROSCORE II score.	
Chapter 7. Non-ischemic diseases of the myocardium. Myocarditis. Cardiomyopathies.	
• to know the definition of myocarditis • to know the classification myocarditis • to understand pathogenesis of myocarditis • to know the etiology of myocarditis • demonstrate abilities in establishing the diagnosis of myocarditis by examining the patient • to know the accusations myocarditis in myocarditis • to know to make a plan of investigation in patients with myocarditis • to be able to analyze the results of laboratory investigations in patients with myocarditis • to prescribe medications in patients with myocarditis • be familiar with the medications that should not be administered to patients with myocarditis. • to know the definition and classification of CMP • to be familiar with particularities in pathogenesis of dilative, hypertrophic, restrictive cardiomyopathies and arrhythmogenic right ventricle dysplasia. • be familiar with the main symptoms and signs in each type of cardiomyopathy. • to develop a plan of investigation for diagnosis of CMP • to be able to interpret the results of laboratory tests in patients with cardiomyopathy. • to prescribe medication to patients with cardiomyopathie • be familiar with the medications that are contraindicated in patients with cardiomyopathies. • be familiar with the methods of interventional and surgical treatment in patients with cardiomyopathies.	• Myocarditis. Definition. Classification. • Etiology. Pathogenesis. The clinical picture. Objective signs. Laboratory investigations. Treatment. Prognosis. • Cardiomyopathies. Definition. Classification. Idiopathic dilative cardiomyopathy. Definition. Classification. Symptoms and signs. Laboratory investigations. Diagnosis. Treatment. • Hypertrophic cardiomyopathy. Definition. Classification. Symptoms and signs. Laboratory investigations. Diagnosis. Treatment. • Restrictive cardiomyopathy. Definitions. Classification Symptoms and signs. Laboratory investigations. Diagnosis. Treatment. • Arrhythmogenic right ventricle dysplasia. Definitions. Classification. Symptoms and signs. Laboratory investigations. Diagnosis. Treatment.

Chapter 8. Primary and secondary diseases of pericardium	
• to be familiar with syndromes in pericarditis. • to define pericarditis • to be familiar with the classification of pericarditis • to know the clinical features of acute and chronic pericarditis. • to know particularities of fibrinous, exudative and constrictive pericarditis and of cardiac tamponade • to be able to appreciate the relative and absolute limits matism of the heart, some signs of pericarditis and heart tamponade. • to develop an investigation plan to establish the diagnosis of pericarditis • to describe the results of paraclinical investigations in patients with pericarditis • to prescribe medication to patients with pericarditis • to know methods of surgical treatment in patients with pericardial syndromes.	• Pericardial syndromes. Definition. Classification. The etiology. • Acute pericarditis. Definition. Classification. The symptoms and signs Laboratory tests. Treatment. • Fibrinous pericarditis. Definition. • Classification. Clinical manifestation. Objective signs. Paraclinic nvestigations. Treatment. • Acute exudative pericarditis. Definitions. Classification. Clinical manifestation. Objective signs. Paraclinic investigations. Treatment. • Cardiac tamponade. Clinical picture. Objective signs. Paraclinic Investigations. Treatment. • Chronic pericarditis. Constrictive pericarditis.
Chapter 8. Infective endocarditis.	
• to define infectious endocarditis • to know the classification of infectious endocarditis. • to know the etiology of infectious endocarditis • to understand the pathogenesis of infectious endocarditis • to know the major and minor Duke criteria for establishing the diagnosis of infectious endocarditis. • to demonstrate the abilities to formulate the diagnosis after discussing with the patient, collecting the anamnestic and examining the patient with infectious endocarditis. • to be able to interpret the results of hemocultures and echocardiography in a patient with infectious endocarditis. • to know the management of infectious endocarditis. • to prescribe the most commonly used antibiotic schemes according to the national clinical protocol. • to know the risk groups for infectious endocarditis and prophylaxis in these categories of patients.	• Infective Endocarditis. • Definition. Classification. • Etiology. • Pathogenesis • Major and minor Duke criteria. • Clinical presentation. • Objective signs. • Paraclinical study. • Differential diagnostic • Antimicrobian tratment. • Surgical treatment. • Prophylaxis. • Prognosis.
Chapter 9. Heart failure	
• to define the heart failure • to know the classification of heart failure. • to understand the causes of heart failure • to know the pathophysiology of heart failure • to know the favoring and precipitating factors of heart failure	• Heart failure. • Causes of heart failure. • Pathophysiology of Heart Failure. Presipitating factors of heart failure. Clinical presentation. • Left-sided and right-sided heart

• to demonstrate ability to obtain clinical symptoms in a pacient with heart failure. • to appreciate the objective signs in HF patients. • to know IC complications and their treatment • to prescribe non-medical and medical treatment: diuretics angiotensin converting enzyme inhibitors angiotensin II receptor blockers digitalis β-blockers, vasodilators non-digitalis inotropic medication anticoagulants antiplatelet agents antiarrhythmics.	failure. • Acute left-sided heart failure. • Acute right-sided heart failure. • Congestive heart failure. • Hipodiastolic heart failure. • Classification. • Complications. • Treatment of heart failure. • Non-pharmacological treatment • Pharmacological treatment • Diuretic agents. • Angiotensin converting enzyme inhibitors • Angiotensin II receptor blockers. • Digitalis. • Vasodilators. • Beta-blockers. • Non-digitalis inotropic medication. • Anticoagulants. • Antiplatelet agents. • Antiarrhythmic drugs. • Alternative vasodilators. • Other methods of adjuvant treatment • Treatment in diastolic heart failure. • Treatment in acute heart failure • Other methods of adjuvant treatment • Treatment in diastolic heart failure. • Treatment in acute heart failure
Chapter 10. Rehabilitation of patients with cardiovascular diseases	
• to define the rehabilitation of patients with cardiovascular diseases • to know what the rehabilitation of patients with cardiovascular diseases includes • to understand the importance of rehabilitation in heart patients • to demonstrate abilities for testing and formulating rehabilitation schemes	• Rehabilitation of patients with cardiovascular disease: angina pectoris acute myocardial infarction hypertension valvulopathy infectious endocarditis myocarditis cardiomyopathy pericardial syndromes arrhythmias heart blocks heart failure.

VIII. PROFESSIONAL COMPETENCES (PROFESSIONAL (PC) AND TRANSVERSAL (TC)) AND GOALS OF STUDY.

PROFESSIONAL COMPETENCES (PC)

- ✓ **PC1. The responsible execution of professional tasks with the application of the values and norms of professional ethics, as well as the provisions of the legislation in force.** Applies the legal and normative framework in practical activity. Respects the norms of ethics and deontology. Ensures the compliance according to ethical and deontological norms and is guided by the provisions of the code of medical ethics. Promotes collegial relationships with co-workers. Carries out free and independent activities according to the oath of the medical profession. Knows and respects the rights and technical rules regarding the sanitary-hygienic and anti-epidemic regime in various socio-medical situations according to the legislation in force. Knows and respects the provisions of the collective labor contract, the protection rules and the safety and health technique at the workplace. Ensures the compliance and correctness of the fulfillment of service obligations in the provision of care to the population in public, private and community medical and sanitary institutions. Encourages informed ethical decision-making and respect the patient's decision.
- ✓ **PC2. Adequate knowledge of the sciences about the structure of the body, the physiological functions and the behavior of the human body in various physiological and pathological states, as well as the existing relationships between the state of health, physical and social environment**. Knows the structures, physiological functions of organs and organ systems in healthy subjects. Recognizes the physiological and pathological processes of the human being and the psychosocial responses of individuals in various states of health. Knows the relevant terminology for the important signs and symptoms derived from various pathophysiological conditions. Identifies pathophysiological processes and their expression, as well as risk factors that determine health and disease at different stages of life cycle. Appreciates the relationship between the state of health, the physical and social environment of the human being. Knows the possible evolution and complications of the main pathological processes.
- ✓ **PC3. Solving clinical situations by developing a diagnosis, treatment and rehabilitation plan in various pathological situations and selecting the appropriate therapeutic procedures for them, including the insurance of emergency medical assistance.** Assesses patients' health status through rigorous history and clinical examination. Applies critical and systematic thinking skills to solve problems and make prompt decisions in various situations. Evaluates and identifies problems in advance, facilitating finding the best solution for situations created by risk, achieving objectives, improving results and ensuring the quality of the work carried out. Performs various practical maneuvers during the clinical examination, necessary to establish the diagnosis. Establishes the diagnosis of the most common conditions. Discusses options, advantages, disadvantages and risks of treatment with patients and is able to help the patients make decisions on their treatment. Prescribes reviews and monitors appropriate therapeutic interventions relevant to clinical practice, including therapeutic and prophylactic indications. Responds promptly, independently, in various situations to save life and improve its quality. Applies first aid techniques in emergency situations. Performs resuscitation and first aid manipulations.
- ✓ **PC4. Promoting a healthy lifestyle, applying preventive measures and self-care.** Applies health's promotion and prevention measures. Identifies opportunities for health maintenance and disease prevention. Identifies opportunities to promote lifestyle changes and other actions that will positively improve health status. Performs health education actions in accordance with medical practice guidelines and protocols. He maintains his own health and is aware of his responsibility as a physician to promote a healthy, evidence-based approach to life. Talks with patients about factors that could influence their health. Participates and supports individuals or the community in health promotion activities, screening programs and provides information about its risks and benefits. Performs prophylaxis activities at the individual level according to

the provisions of the clinical protocols. Promotes and applies measures to promote personal health and stress management at work. Systematically performs the medical examination to maintain the health individually.

- ✓ **PC5. Interdisciplinary integration of doctor's work in the team with the efficient use of all resources.** Communicates, interacts and works effectively with collectives and with inter-professional staff, individuals, families and groups of people. Interacts effectively with other professionals involved in patient care, demonstrating respect for colleagues and other healthcare professionals. Develops positive collaborative relationships with team members involved in patient care as well as the ability to adapt to change. Provides appropriate and timely support for service users in navigating the health system, including services, access to care and available resources. Makes effective use of language skills, information technologies and communication skills.
- ✓ **PC6. Conducting scientific researches in the field of health and other branches of science.** Plans, organizes and executes scientific researches in the field. Identifies sources of information, selects research materials and methods, and performs experiments, statistical processing of research results, formulates conclusions and proposals. Elaborates and supports speeches, presentations at scientific events by demonstrating personal attitude, coherence in expression and scientific correctness; participates in discussions and debates at scientific events.

TRANVERSAL COMPETENCES (TC)

TC1. Autonomy and responsibility in activity. The application of rigorous and efficient work rules, the manifestation of a responsible attitude towards the performance of professional tasks with the application of the values and norms of professional ethics, as well as the provisions of the legislation in force. Promoting logical reasoning, practical applicability, evaluation and self-evaluation in decision-making.

GOALS OF STUDY

- To know the definitions and classifications of cardiovascular pathologies;
- To understand the etiopathogenicity of cardiovascular diseases;
- To be able to examine a patient with cardiac pathology, knowing and specifying clinical symptoms, physical signs and anamnesties.
- To be able to develop an assessment plan for the patient with cardiac disease and to prescribe them correctly;
- To know I-st line drugs in the treatment of cardiovascular disease and to prescribe them correctly;
- To show the role of primary and secondary prophylaxis in cardiac patients, knowing and using the scores and grids used in cardiology;
  To know the basic principles of rehabilitation of patients with cardiovascular diseases;
- To be able to assess the place and role of cardiology in preparing the student as a doctor ;
- To be able to implant the knowledge gained in the work of the researcher;
- To be competent to use the knowledge gained using the new information and communication technologies;

IX. INDIVIDUAL WORK OF THE STUDENT

Nr.	Expected ability	Implementation Strategies	Evaluation criterias	Deadline
	Working with information sources:	Reading lecture or the material from the manual of the topic carefully. Reading questions on the topic, which require a reflection on the subject. To get acquainted with the list of additional information sources on the topic. To select the source of additional information on the topic. Reading the text carefully and writing the essential content Formulation of conclusions regarding the importance of the theme / subject.	Ability to extract the essentials; interpretative skills; the volume of work	During the period of study
	Work with pacient	To educate the patient for diet, daily activities etc. To communicate and examine the patient with cardiovascular pathology according to the thematic plan: interrogation, palpation, percussion, auscultation. To develop an investigation plan. To read the paraclinical results. To argue the diagnosis. To choose non-medication and medical treatment. To formulate conclusions at the end of each lesson. To verify the finality of lessons and appreciate its achievement. To select additional information, using electronic addresses and additional bibliography.	Volume of work, patient, clinical cases, tests, ability to formulate conclusions	
	Apply different learning techniques	Problems Situations Projects	Level of scientific argumentation, quality of conclusions, elements of creativity, demonstration of understanding the problem, formation of personal attitude	During the period of study
	Working with materials online	ESC Guides, SCORE Computers, RFG, GRACE; TIMI; EUROSCORE II national clinical protocols, expressing your own opinions through forum and chat	Number and duration of forum and chat entries, self-evaluation results	During the period of study
	Create and solve clinical cases and complete medical files	Selection of the patient with cardiac disease for the medical file, establishment of the plan of investigation, establishment of the terms of realization	Level of scientific argumentation, elements of creativity, personal attitude formation,	During the period of study

Nr.	Expected ability	Implementation Strategies	Evaluation criterias	Deadline
		Choosing the pacient for Power Point case presentation - topic, purpose, results, conclusions, practical applications, bibliography.	coherence of exposure and scientific correctness, graphic presentation, way of presentation	

X. METODOLOGICAL SUGESTIONS OF TEACHING-EVALUATION

- ***Teaching methods used*** in the teaching discipline Cardiology are used various methods and didactic processes, geared toward achieving the objectives of effective and appropriate instructional. Within the theoretical lessons, along with traditional methods (lecture-discusion, lecture-conversation, lecture - summary) and modern methods are used (lecture-conversation, lecture-conference, problemisation lecture). In the framework of practical works are used for individual task forms, frontal, group, clinical cases, projects. For acquiring a deeper material, use different semiotice systems (scientific language, graphic language and computerized) and teaching materials (tables, diagrams, micro, EKG, x-rays, echocardiography, coronaroangiografii). Within lessons and extracurricular activities are used Informational Communicative Technologies– presentations PowerPoint, on-line lections.
- ***Methods of the recommended studiyng***
  - **Observation**-identifying symptoms and physical signs characteristic for some cardiovascular pathologies, the description of those events.
  - **Analysis -** The demonstration of normal biomarchers. To study and analyse each pathological biomarcher in patient with cardiovascular disease.
  - **Analysis of the schema/figure -** Selecting the necessary information regarding the pathogenesis of cardiac hemodynamics or disease. Recognition on the basis of knowledge and information selected from the normal deviation as indicated in the drawing or schema. Analysis of the functions/role recognised structures.
  - **Comparison -** Analysis results obtained from a patient with cardiac pathology and the determination of the essential traits of the disease database. Analysis of the second patient with the same disease, but with different peculiarities of evolution. Comparing of these patients and demonstration of common traits and determine the differences. Criteria for deosibire. The formulation of conclusions.
- ***Aplicated didactic strateges/technologies (specific for the discipline);***
  „Brainstorming", „Multi-voting"; „Masa rotunda"; „Interviul de grup"; „Studiul de caz"; „Controversa creativa"; „Tehnica focus-grup", „Portofoliu".
  Virtual clinical cases.
- ***Metods of evaluation*** *(including indicating the manner of calculating the final mark).*
  - ✓ **Curent***:* frontal or/and individual control by
    - (a) tests aplication,
    - (b) clinical cases resolving,
    - (c) clinical cases virtual presentations
    - (d) realisation of the games with different roles in the discussed subjects.
    - (e) control works
  - ✓ **Final:** exam

Final mark will be gathered from the annual mark (media from the 10 seminars, file of the patients clinical examination and the presenting of the clinical case) (cota part 0.3), mark from the practical skills near the patients bed (cota part 0.2), final test final in computerised

system (cota part 0.2) and mark from the oral exam with the answer from the formated ticket from 4 questions (cota part 0.3).

The average annual mark and the marks of all the final stages of the final examination will be expressed in numbers according to the scoring scale (according to the table) and the final mark obtained will be expressed in two decimal places, which will be entered in the notes book.

Failure to attend the examination without good reason is recorded as "absent" and is equivalent to 0 (zero). The student is entitled to 2 repeated claims of the unsuccessful exam.

How to round up the grades at the evaluation steps

Intermediate note grid (annual average, grades from the exam stages)	National grading system	Equivalent ECTS
1,00-3,00	**2**	**F**
3,01-4,99	**4**	**FX**
5,00	**5**	**E**
5,01-5,50	**5,5**	
5,51-6,0	**6**	
6,01-6,50	**6,5**	**D**
6,51-7,00	**7**	
7,01-7,50	**7,5**	**C**
7,51-8,00	**8**	
8,01-8,50	**8,5**	**B**
8,51-8,00	**9**	
9,01-9,50	**9,5**	**A**
9,51-10,0	**10**	

XI. RECOMMENDED BIBLIOGRAPHY

A. Obligatory

1. Braunwald's heart disease: a textbook of cardiovascular medicine: [in 2 vol.], 7th edition, 8th edition: D.P. Zipes, P. Libby, R.O. Bonow, E. Braunwald, Vol 1-2, 2005, 2008.
2. Oxford American Handbook of Cardiology Book, 2010.

B. Supplementary:

1. Dale Dubin. Rapid Interpretation of EKG. 2010.
2. Brown Jeremy. Cardiology Emergencies. 2010.
3. Grejdieru A., Grib L., Mazur M., et al. Infective endocarditis. Guide for students. Centrul Editorial - Poligrafic „Medicina". Chișinău, 2014, 71 p.
4. Elena Samohvalov, Marcel Abraș, Livi Grib. „Significance of the risk factor în cardiovascular disease". Chișinău 2018, CEP Medicina., 96 p.
5. European Heart Journal. www.escardio.org
6. ESC Guidline: www.escardio.org