Ministry of Health of the Russian Federation

federal state budgetary educational institution
higher education
"North-Western State Medical University named after I.I. Mechnikov"

Ministry of Health of the Russian Federation

(Federal State Budgetary Educational Institution of Higher Education North-Western State Medical University named after I.I. Mechnikov of the Ministry of Health of the Russian Federation)

DISCIPLINE WORK PROGRAM

Cardiology

Specialty: 31.05.01 General Medicine

Specialization: Organization and provision of primary health care to the adult population in medical organizations

Implementation language: Russian, English

2021

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Compilers of the work program of the discipline:
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The work program of the discipline was discussed at a department meeting
M.S. Kushakovsky Department of Hospital Therapy and CardiologyMay 00, 2021, Minutes no. 16 January 2021 Protocol No.3

Head of Department _____ / Sayganov S.A. /

Approved by the Methodological Commission for the specialty 31.05.01 General Medicine
May 11, 2021

Chairman _____ / Bakulin I.G./
(signature)

Reviewed by the Methodological Council and recommended for approval by the Academic Council
May 20, 2021

Chair _____ / Artyushkin S.A. /
(signature)

Date of update:

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1. The purpose of mastering the discipline

The purpose of mastering the discipline ‘Cardiology’ is to develop students’ competencies and further advance their interdisciplinary clinical reasoning, as well as to provide the theoretical knowledge, practical skills, and abilities required for the diagnosis, differential diagnosis, prevention, and treatment of cardiovascular diseases, taking into account all aspects of patients’ lives, occupational activities, and comorbidities, in preparation for independent practice.

2. The place of discipline in the structure of the educational program

The discipline ‘Cardiology’ belongs to the part of Block 1 ‘Disciplines (Modules)’ formed by participants in educational relations within the main professional educational program in specialty 31.05.01 General Medicine (specialist degree level), focus: Organization and Delivery of Primary Health Care to the Adult Population in Medical Organizations. The discipline is mandatory.

3. List of planned learning outcomes in the discipline, correlated with the planned results of mastering the educational program

Code and name of competency	Code and name of the competency achievement indicator
PC-2. Able to examine a patient in order to identify major pathological conditions, symptoms, disease syndromes, and nosological entities.	ID-1 PC-2.1. Interviews and examines the patient (collects complaints and medical and life history; performs inspection, palpation, percussion, and auscultation). ID-2 PC-2.2. Formulates a preliminary diagnosis, prepares an investigation plan, and refers the patient for laboratory and/or instrumental testing when medically indicated, in accordance with current medical-care procedures, clinical guidelines, and standards of medical care. ID-3 PC-2.3. Refers the patient for consultation with medical specialists and/or for specialized medical care in an inpatient or day-hospital setting when medically indicated, in accordance with current medical-care procedures, clinical guidelines, and standards of medical care. ID-4 PC-2.4. Performs differential diagnosis with other diseases/conditions. ID-5 PC-2.5. Establishes a diagnosis with due regard to clinical classifications and the current International Statistical Classification of Diseases and Related Health Problems (ICD).
PC-3. Able to manage and treat patients requiring medical care.	ID-1 PC-3.1. Develops a treatment plan and prescribes non-pharmacological and pharmacological treatment, taking into account the diagnosis, age, and clinical presentation, in accordance with current medical-care procedures, clinical guidelines, and standards of medical care in the primary health-care setting.
PC-5. Able to determine the need for natural therapeutic factors, pharmacological and non-pharmacological therapy, and other methods in patients requiring medical rehabilitation and health-resort treatment.	ID-1 PC-5.1. Identifies and refers patients requiring medical rehabilitation to a specialist for the prescription and implementation of medical rehabilitation and/or health-resort treatment, including under an individual rehabilitation or habilitation program for persons with disabilities, in accordance with current medical-care procedures, clinical guidelines (treatment protocols), and standards of medical care.

Competency achievement indicator code	Learning outcomes (assessment indicators)	Evaluation tools
ID-1 PC-2.1.	**knows: the methodology for collecting complaints and medical-history data and for examining a patient;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: analyze interview and physical-examination findings to recognize a condition or establish the presence or absence of disease; identify the leading clinical syndrome;	
	has skills in: performing and interpreting patient interview and physical-examination findings;	
ID-2 PC-2.2.	**knows: the physiology and pathophysiology underlying the development of the principal clinical symptoms and syndromes, and methods for confirming their presence;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: analyze clinical data obtained during patient examination from the standpoint of pathophysiological processes;	
	has skills in: formulating a preliminary diagnosis and preparing a patient investigation plan in accordance with current medical-care procedures and clinical guidelines;	
ID-3 PC-2.3.	**knows: the physiology and pathophysiology underlying comorbid conditions;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: determine indications for specialist consultation and specialized inpatient medical care;	
ID-4 PC-2.4.	**knows: the pathophysiology underlying the development of the principal clinical symptoms and syndromes;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: interpret interview and physical-examination findings and laboratory, instrumental, and other morphological investigation data in order to establish a diagnosis;	
	has skills in: performing differential diagnosis of the principal clinical syndromes;	
ID-5 PC-2.5.	**knows: the physiology and pathophysiology underlying the principal clinical symptoms and syndromes; methods for confirming their presence; and the main approaches to pathogenetic treatment of internal diseases;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: analyze all clinical, laboratory, and instrumental data obtained during patient examination from the standpoint of pathophysiological processes and formulate a clinical diagnosis in accordance with the International Statistical Classification of Diseases and Related Health Problems;	
	has skills in: establishing a clinical diagnosis in pathological conditions and common internal diseases in accordance with the International Statistical Classification of Diseases and Related Health Problems;	
ID-1 PC-3.1.	**knows: management strategies for patients with various internal diseases; therapeutic treatment programs for**	– test questions, – test tasks,

	internal diseases; and the algorithm for selecting medicines and non-pharmacological treatment methods depending on the diagnosis and individual patient characteristics; indications and contraindications for the use of medicinal products	– situational tasks – written report – student case history
	is able to: assess the patient's condition, prescribe appropriate treatment, predict the course of the disease, and evaluate the beneficial and adverse effects of medicines used to treat internal diseases;	
	has skills in: prescribing appropriate treatment consistent with the established diagnosis and selecting pharmacological and non-pharmacological therapy for patients with the most common internal diseases;	
ID-1 PC-5.1.	**knows: indications for referral to a specialist for the prescription and implementation of medical rehabilitation and/or health-resort treatment;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: identify and refer patients requiring medical rehabilitation to a specialist for the prescription and implementation of medical rehabilitation and/or health-resort treatment in accordance with current medical-care procedures, clinical guidelines (treatment protocols), and standards of medical care;	

4. Scope of discipline and types of academic work

Type of educational work	Labor intensity	Semesters
		12
Contact work between students and teachers	**48**	**48**
Classroom work:	46	46
Lectures (L)	12	12
Practical exercises (PP)	34	34
Independent work:	**24**	**24**
during the period of theoretical training	20	20
preparation for the test	4	4
Intermediate assessment: test, including delivery and group consultations	2	2
Total workload: academic hours	**72**	
credit units	**2**	

5. The content of the discipline, structured by sections (topics) indicating the number of academic hours and types of training sessions

5.1.Content of discipline sections

item no.	Name of discipline section	Annotated content of the discipline section	List of competencies formed in the process of mastering the section

item no.	Name of discipline section	Annotated content of the discipline section	List of competencies formed in the process of mastering the section
1	Arterial hypertension	Clinical presentation, diagnosis, and treatment of different patterns of arterial hypertension. Secondary arterial hypertension.	PC-2, PC-3, PC-4, PC-5
2	Atherosclerosis	Dyslipoproteinemias. Diagnostic methods. Treatment of atherosclerosis. Non-pharmacological interventions. Lipid-lowering agents. Primary and secondary prevention.	PC-2, PC-3, PC-4, PC-5
3	Myocardial diseases	Myocarditis Current classification of myocarditis: clinical presentation, diagnosis, and treatment. Cardiomyopathies Current classification, clinical presentation, diagnosis, and treatment.	PC-2, PC-3, PC-5
4	Endocardial diseases	Etiology of infective endocarditis. Diagnostic criteria. Treatment. Prevention.	PC-2, PC-3, PC-5
5	Ischemic heart disease	Current clinical classification of ischemic heart disease (IHD). Diagnostic methods. Treatment methods. Acute coronary syndrome. ECG changes. Pharmacological treatment. Indications for invasive procedures.	PC-2, PC-3, PC-5
6	Cardiac rhythm and conduction disorders	Premature beats (supraventricular and ventricular). Atrial fibrillation and flutter. Pathogenesis, clinical presentation, and diagnosis. Methods of restoring sinus rhythm. Secondary prevention. Ventricular tachycardias. Management of patients with ventricular tachycardia. Atrioventricular blocks.	PC-2, PC-3, PC-5
7	Circulatory failure	Classifications of chronic heart failure. Clinical forms of heart failure. Treatment of chronic heart failure.	PC-2, PC-3, PC-5
8	Aortic diseases	Acute aortic syndrome. Aortic aneurysm. Genetic aortic diseases. Atherosclerotic aortic disease. Aortitis.	PC-2, PC-3, PC-5

5.2.Thematic plan of lectures

item no.	Name of discipline section	Lecture topics	Active learning formats*	Labor intensity (academic hours)

item no.	Name of discipline section	Lecture topics	Active learning formats*	Labor intensity (academic hours)
1	Arterial hypertension	L.1. Treatment of arterial hypertension in associated clinical conditions	Lecture-discussion	2
2	Circulatory failure	L.2. Diagnosis and treatment of chronic heart failure	Lecture-discussion	2
3	Myocardial diseases	L.3. Cardiomyopathies: diagnosis and treatment		2
4	Atherosclerosis	L.4. Primary prevention of atherosclerosis	Lecture-discussion	2
5	Ischemic heart disease	L.5. Thrombosis and antithrombotic therapy in cardiology	Lecture-discussion	2
6	Aortic diseases	L.6. Aortic diseases: diagnosis and treatment	Lecture-discussion	2
		TOTAL:		12

LD – lecture-discussion

5.3.Thematic plan for practical classes

№ p/p	Name of discipline section	Topics of practical classes	Active forms of learning	Current control forms	Labor intensity (academic hours)
1	Myocardial diseases	PC1. Clinical presentation and diagnosis of myocarditis. Complaints and objective-examination findings. Heart failure. Rhythm and conduction disorders. Increased activity of enzymes and isoenzymes. Role of myocardial biopsy. Differential diagnosis with other myocardial diseases. Clinical-course variants of myocarditis.	GD	Oral assessment, testing, and solving clinical cases	4
2	Ischemic heart disease	PC2. Diagnostic methods for IHD. Patient examination. Medical history. Laboratory methods. Standard ECG in IHD. Ambulatory ECG monitoring. Echocardiography. Coronary-artery imaging options.	GD	Oral assessment, testing, and solving clinical cases	4
3	Ischemic heart disease	PC3. Forms of acute coronary syndrome. ST-segment elevation acute coronary syndrome. Non-ST-segment elevation acute coronary syndrome. Selection of therapy according to the form.	GD	Oral assessment, testing, and solving clinical cases	4

		Pharmacological treatment. Indications for invasive procedures.			
4	Ischemic heart disease	PC4. Clinical presentation (typical and atypical forms) of acute myocardial infarction. ECG changes. Laboratory diagnosis. Coronary angiography. Principles of treatment.	GD	Oral assessment, testing, and solving clinical cases	4
5	Cardiac rhythm and conduction disorders	PC5. Premature beats (supraventricular and ventricular). Grading by frequency and complexity. Allorhythmias. Premature beats in individuals without evidence of cardiovascular disease and in cardiac patients. Indications for treatment and selection of therapy.	*AC*	Oral assessment, testing, and solving clinical cases	4
6	Cardiac rhythm and conduction disorders	PC6. Paroxysmal supraventricular tachyarrhythmias. Inappropriate sinus tachycardia. Sinus nodal reentrant tachycardia. Atrial tachycardias: focal atrial tachycardia, macroreentrant atrial tachycardia, and multifocal atrial tachycardia. Atrioventricular nodal tachycardia. Focal junctional tachycardia. Non-paroxysmal junctional reciprocating tachycardia. Tachycardia involving accessory conduction pathways: orthodromic, antidromic, and Mahaim tachycardia.	AC	Oral assessment, testing, and solving clinical cases	4
7	Cardiac rhythm and conduction disorders	PC7. Atrial flutter. Atrial fibrillation. Differential diagnosis and prognostic significance of supraventricular tachyarrhythmias. Management of patients with supraventricular tachycardias and tachyarrhythmias.	AC	Oral assessment, testing, and solving clinical cases	4
8	Cardiac rhythm and conduction disorders	PC8. Ventricular tachycardias. Monomorphic ventricular tachycardia. Polymorphic ventricular tachycardia (torsades de pointes). Bidirectional ventricular tachycardia. Catecholaminergic ventricular tachycardia. Ventricular tachycardia in long-QT syndrome,	AC	Oral assessment, testing, and solving clinical cases	4

		short-QT syndrome, and Brugada syndrome. Differential diagnosis, management, and prognostic significance of ventricular tachycardias.			
9	Endocardial diseases	PC9. Etiology of infective endocarditis. Diagnostic criteria. Treatment. Prevention.	GD	Oral assessment, testing, and solving clinical cases	2
TOTAL					34

GD - group discussion
AS - situation analysis

5.4. Seminar schedule: not applicable

5.5.Laboratory-work schedule: not applicable

5.6. Independent work:

item no.	Name of discipline section	Types of independent work*	Current control forms	Labor intensity (academic hours)
1	Arterial hypertension	Working with lecture notes and educational and scientific literature; writing a student case history; preparing a written report Preparation for the test	Review of the case history, testing, oral assessment, written report	3
2	Atherosclerosis	Working with lecture notes and educational and scientific literature; writing a student case history; preparing a written report; preparation for the pass/fail assessment	Review of the case history, testing, oral assessment, written report	3
3	Myocardial diseases	Working with lecture notes and educational and scientific literature; writing a student case history; preparing a written report; preparation for the pass/fail assessment	Review of the case history, testing, oral assessment, written report	3
4	Endocardial diseases	Working with lecture notes and educational and scientific literature; writing a student case history; preparing a written report; preparation for the pass/fail	Review of the case history, testing, oral assessment, written report	3

		assessment		
5	Ischemic heart disease	Working with lecture notes and educational and scientific literature; writing a student case history; preparing a written report; preparation for the pass/fail assessment	Review of the case history, testing, oral assessment, written report	3
6	Cardiac rhythm and conduction disorders	Working with lecture notes and educational and scientific literature; writing a student case history; preparing a written report; preparation for the pass/fail assessment	Review of the case history, testing, oral assessment, written report	3
7	Circulatory failure	Working with lecture notes and educational and scientific literature; writing a student case history; preparing a written report; preparation for the pass/fail assessment	Review of the case history, testing, oral assessment, written report	3
8	Aortic diseases	Working with lecture notes and educational and scientific literature; writing a student case history; preparing a written report; preparation for the pass/fail assessment	Review of the case history, testing, oral assessment, written report	3
			TOTAL:	24

6. Guidelines for students on mastering the discipline

To study Cardiology effectively, students must attend and review the lecture material. In preparation for practical classes, students are advised to independently study the teaching materials available in MOODLE and complete the tests for all proposed topics. During practical classes, students should participate actively in discussion of the topic and, when necessary, seek guidance from the instructor.

To prepare a written report, students should select the necessary literature from the university library or other sources, analyze the material, identify the key concepts, and prepare the report in accordance with the requirements. For the defense, students should prepare a brief presentation and deliver it during a practical class.

7. Evaluation materials

Assessment materials for the discipline for ongoing monitoring of progress and intermediate certification of students include examples of assessment tools (Appendix A to the work program of the discipline), procedure and assessment criteria.

8. List of educational literature and Internet resources necessary for mastering the discipline

8.1. Educational literature:

1. Internal Medicine. The Cardiovascular System: study guide / G. E. Roitberg, A. V. Strutynsky. 3rd ed. Moscow: MEDpress-inform, 2013. 895 p.: [4] leaves of color illustrations, figures. References: pp. 894–895. ISBN 978-5-98322-936-5.
2. Cardiology [electronic resource]: National Guideline / ed. by E. V. Shlyakhto. 2nd rev. and expanded ed. Moscow: GEOTAR-Media, 2015. http://www.rosmedlib.ru/book/ISBN9785970428450.html
3. Cardiac Arrhythmias: Fundamentals of Electrophysiology, Diagnosis, Treatment, and Current Recommendations [electronic resource] / G. K. Kiyakbaev; ed. by V. S. Moiseev. Moscow: GEOTAR-Media, 2013. Specialist Physician's Library series. http://www.rosmedlib.ru/book/ISBN9785970427217.html
4. Clinical Guidelines for Electrophysiological Studies, Catheter Ablation, and the Use of Implantable Antiarrhythmic Devices [electronic resource]. https://vnoa.ru/upload/Recomendation_2017_30_10_2017_HR.pdf
5. Diagnosis and Treatment of Cardiac Rhythm and Conduction Disorders (National Clinical Guidelines) [electronic resource]. http://193.232.7.120/feml/clinical_ref/0001393213S/HTML/
6. Olesin A. I. Heart Failure (Acute and Chronic): Diagnosis and Treatment: teaching guide / A. I. Olesin, I. V. Konstantinova, N. N. Tyuteleva. St. Petersburg: North-Western State Medical University named after I. I. Mechnikov, Ministry of Health of Russia, 2024. 140 p. https://sdo.szgmu.ru/pluginfile.php/921810/mod_resource/content/2/%D0%9E%D0%BB%D0%B5%D1%81%D0%B8%D0%BD_%D0%A1%D0%B5%D1%80%D0%B4%D0%B5%D1%87%D0%BD%D0%B0%D1%8F%20%D0%BD%D0%B5%D0%B4%D0%BE%D1%81%D1%82%D0%B0%D1%82%D0%BE%D1%87%D0%BD%D0%BE%D1%81%D1%82%D1%8C.pdf
7. Olesin A. I. Acquired and Congenital Heart Defects: Diagnosis and Patient-Management Strategy: teaching guide / A. I. Olesin, I. V. Konstantinova, N. N. Tyuteleva. St. Petersburg: North-Western State Medical University named after I. I. Mechnikov, Ministry of Health of Russia, 2024. 128 p. https://sdo.szgmu.ru/pluginfile.php/986029/mod_resource/content/2/%D0%9E%D0%BB%D0%B5%D1%81%D0%B8%D0%BD_%D0%9F%D1%80%D0%B8%D0%BE%D0%B1%D1%80%D0%B5%D1%82%D0%B5%D0%BD%D0%BD%D1%8B%D0%B5%20%D0%B8%20%D0%B2%D1%80%D0%BE%D0%B6%D0%B4%D0%B5%D0%BD%D0%BD%D1%8B%D0%B5%20%D0%BF%D0%BE%D1%80%D0%BE%D0%BA%D0%B8%20%D1%81%D0%B5%D1%80%D0%B4%D1%86%D0%B0.pdf
8. Olesin A. I. Secondary Arterial Hypertension: Differential Diagnosis and Treatment: teaching guide / A. I. Olesin, I. V. Konstantinova, N. N. Tyuleneva; Ministry of Health of the Russian Federation; North-Western State Medical University named after I. I. Mechnikov, M. S. Kushakovsky Department of Hospital Therapy and Cardiology. St. Petersburg, 2023. 98 p. https://sdo.szgmu.ru/pluginfile.php/919177/mod_resource/content/1/%D0%9E%D0%BB%D0%B5%D1%81%D0%B8%D0%BD_%D0%92%D1%82%D0%BE%D1%80%D0%B8%D1%87%D0%BD%D1%8B%D0%B5%20%D0%B0%D1%80%D1%82%D0%B5%D1%80%D0%B8%D0%B0%D0%BB%D1%8C%D0%BD%D1%8B%D0%B5%20%D0%B3%D0%B8%D0%BF%D0%B5%D1%80%D1%82%D0%B5%D0%BD%D0%B7%D0%B8%D0%B8.pdf
9. Olesin A. I. Cardiac Rhythm and Conduction Disorders: Diagnosis and Treatment: teaching guide / A. I. Olesin, I. V. Konstantinova, N. N. Tyuteleva; Ministry of Health of the Russian Federation; North-Western State Medical University named after I. I. Mechnikov, M. S. Kushakovsky Department of Hospital Therapy and Cardiology. St. Petersburg, 2023. 152 p. https://sdo.szgmu.ru/pluginfile.php/881802/mod_resource/content/1/%D0%9E%D0%BB%D0%B5%D1%81%D0%B8%D0%BD_%D0%9D%D0%B0%D1%80%D1%83%D1%88%D0%B5%D0

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10. Olesin A. I. Non-Coronary Heart Diseases (Cardiomyopathies, Pericarditis, Myocarditis): Diagnosis and Patient-Management Strategy: teaching guide / A. I. Olesin, T. N. Novikova, I. V. Konstantinova et al. St. Petersburg: North-Western State Medical University named after I. I. Mechnikov, Ministry of Health of Russia, 2024. 180 p. https://sdo.szgmu.ru/pluginfile.php/986018/mod_resource/content/1/%D0%9E%D0%BB%D0%B5%D1%81%D0%B8%D0%BD_%D0%9D%D0%B5%D0%BA%D0%BE%D1%80%D0%BE%D0%BD%D0%B0%D1%80%D0%BE%D0%B3%D0%B5%D0%BD%D0%BD%D1%8B%D0%B5%20%D0%B7%D0%B0%D0%B1%D0%BE%D0%BB%D0%B5%D0%B2%D0%B0%D0%BD%D0%B8%D1%8F%20%D0%A1%D0%B5%D1%80%D0%B4%D1%86%D0%B0.pdf
11. Olesin A. I. Clinical Patterns of Ischemic Heart Disease: Diagnosis and Treatment: teaching guide / A. I. Olesin, I. V. Konstantinova, N. N. Tyuteleva; Ministry of Health of the Russian Federation; North-Western State Medical University named after I. I. Mechnikov, M. S. Kushakovsky Department of Hospital Therapy and Cardiology. St. Petersburg, 2023. 168 p. https://sdo.szgmu.ru/pluginfile.php/881742/mod_resource/content/1/%D0%9E%D0%BB%D0%B5%D1%81%D0%B8%D0%BD_%D0%98%D0%91%D0%A1%20%282%29.pdf

8.2. Resources of the Internet information and telecommunications network:

Name of Internet resource	Email address of the resource
Russian Society of Cardiology	www.scardio.ru
Russian National Electronic Library	www.elibrary.ru
Federal Electronic Medical Library of the Ministry of Health of the Russian Federation	www.femb.ru
Information and educational system for medical practitioners	www.rosmedlib.ru

9. List of information technologies used to master the discipline, including a list of software, professional databases and information reference systems

9.1. List of information technologies used in the educational process:

item no.	Name of discipline section	Information technology
	Arterial hypertension Atherosclerosis Myocardial diseases Endocardial diseases Ischemic heart disease Cardiac rhythm and conduction disorders Circulatory failure Aortic diseases	Educational materials in the electronic educational environment of North-Western State Medical University named after I. I. Mechnikov, Ministry of Health of Russia: https://moodle.szgmu.ru/course/view.php?id=428

9.2. List of software used in the educational process (licensed and freely distributed software, including domestically produced):

item no.	Software product name	License validity period	Documents confirming right to use software products
licensed software			
1.	ESET NOD 32	1 year	Government contract № 07/2020
2.	MS Windows 8 MS Windows 8.1 MS Windows 10 MS Windows Server 2012 Datacenter - 2 Proc MS Windows Server 2012 R2 Datacenter - 2 Proc MS Windows Server 2016 Datacenter Core	Unlimited	State contract No. 30/2013-O; Government contract No. 399/2013-OA; Government contract No. 07/2017-EA.
3.	MS Office 2010 MS Office 2013	Unlimited	Government contract No. 30/2013-OA; Government contract No. 399/2013-OA.
4.	Academic LabVIEW Premium Suite (1 User)	Unlimited	Government contract № 02/2015
licensed software of domestic production			
1.	Anti-plagiarism	1 year	Government contract № 2409
2.	“WEBINAR (WEBINAR)” VERSION 3.0	1 year	Contract No. 347/2020-M
3.	"3KL e-learning environment"	1 year	Contract No. 348/2020-M
4.	TrueConf Enterprise	1 year	Contract No. 396/2020-EA
free software			
1.	Google Chrome	Unlimited	Open License Agreement GNU GeneralPublicLicense
2.	NVDA	Unlimited	Open License Agreement GNU GeneralPublicLicense
freely distributed software of domestic production			
1.	Moodle	Unlimited	Open License Agreement GNU GeneralPublicLicense

9.3. List of professional databases and information reference systems:

item no.	Name software product	License validity period	Documents confirming right to use software products	Mode access for disabled students and persons with limited health capabilities
1.	Consultant Plus	1 year	Agreement No. 655/2020-EA	-
2.	EBS “Student Consultant”	1 year	Contract No. 307/2020-EA	http://www.studmedlib.ru/
3.	EMB “Doctor Consultant”	1 year	Contract No. 281/2020-EA	http://www.rosmedlib.ru/

4.	EBS "Ibooks.ru/ibooks.ru"	1 year	Contract № 06/2020	https://ibooks.ru
5.	EBS “IPRBooks”	1 year	Contract No. 08/2020-ZK	http://www.iprbookshop.ru/special
6.	Electronic library system “Bukap”	1 year	Contract № 05/2020	https://www.books-up.ru/
7.	EBS "Lan Publishing House"	1 year	Contract No. 395/2020-EA	https://e.lanbook.com/

10. Material and technical support of discipline

Lecture classrooms, group and individual consultation rooms, and rooms for ongoing assessment and interim certification of students, located at 47 Piskarevsky Prospekt, Building R (Building 9), St. Petersburg, North-Western State Medical University named after I. I. Mechnikov, Ministry of Health of Russia, and equipped with teaching equipment and technical aids.
Equipment: chalkboard; instructor’s desk; two-seat student desks; student chairs.
Teaching technology: multimedia projector, instructor’s laptop, system unit, and monitor. Special assistive technology: Roger Pen (individual wireless pen-shaped transmitter) and Roger MyLink (Roger Pen signal receiver) for students with hearing impairment; IntelliKeys (wired keyboard with Russian Braille lettering and a matte black finish). Address: rooms 18 and 19, Building R (Building 9), 47 Piskarevsky Prospekt, St. Petersburg, North-Western State Medical University named after I. I. Mechnikov, Ministry of Health of Russia.

Classrooms for seminar-type sessions, group and individual consultations, ongoing assessment, and interim certification, equipped with teaching equipment and technical aids: rooms 20, 21, 37, and 38, Pavilion 19-3 (Building O), 47 Piskarevsky Prospekt, St. Petersburg, North-Western State Medical University named after I. I. Mechnikov.
Equipment: board (chalk); teacher's table, student's double table
Technical teaching aids: teacher's laptop.

The following specialized equipment is used:

- upright torso mannequin for demonstrating physical examination of the respiratory system, with simulation of cardiac and pulmonary auscultatory findings;
- adult cardiopulmonary resuscitation training mannequin; Harvey UM689 cardiopulmonary patient simulator;
- 12-lead ECG skills mannequin-simulator, model 260-20001 ZXD190;
- ECG skills mannequin-simulator;
- simulator for physical examination of a cardiology patient;
- abdominal-examination trainer and auscultation trainer set;

cardiology-patient examination simulator with synchronized blood-pressure readings and vascular pulsations.

Clinical training sites and agreements.

- City Pokrovskaya Hospital — Agreement No. 62/2015-OPP dated April 28, 2015;
- L. G. Sokolov Clinical Hospital No. 122, Federal Medical-Biological Agency — Agreement No. 83/2015-OPP dated September 3, 2015;
- City Hospital No. 3, Hospital of Saint Venerable Martyr Elizabeth — Agreement No. 48/2017-OPP dated May 5, 2017;
- Albrecht St. Petersburg Scientific and Practical Center for Medical and Social Expertise, Prosthetics and Rehabilitation of Persons with Disabilities, FMBA of Russia — Agreement No. 56/2014-OPP dated May 27, 2014;
- Hospital for War Veterans — Agreement No. 139/2017-OPP dated March 23, 2017;
- City Hospital No. 15 — Agreement No. 105/2018-OPP dated May 14, 2018.

Rooms for students' independent work, equipped with computers, Internet access, and access to the University's electronic educational environment: rooms 18 and 19, Building R (Building 9), 47 Piskarevsky Prospekt, St. Petersburg, North-Western State Medical University named after I. I. Mechnikov, Ministry of Health of Russia.

Appendix A

Ministry of Health of the Russian Federation

federal state budgetary educational institution
higher education
"North-Western State Medical University
named after I.I. Mechnikov"
Ministry of Health of the Russian Federation

(Federal State Budgetary Educational Institution of Higher Education North-Western State Medical University named after I.I. Mechnikov of the Ministry of Health of the Russian Federation)

EVALUATION MATERIALS

(for ongoing monitoring of progress and intermediate certification of students)

Specialty:	31.05.01 General medicine
Direction:	Organization and provision of primary health care to the adult population in medical organizations
Name of discipline:	Cardiology

St. Petersburg – 2021

1. List of planned learning outcomes in the discipline

Competency achievement indicator code	Learning outcomes (assessment indicators)	Evaluation tools
ID-1 PC-2.1.	**knows: the methodology for collecting complaints and medical-history data and for examining a patient;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: analyze interview and physical-examination findings to recognize a condition or establish the presence or absence of disease; identify the leading clinical syndrome;	
	has skills in: performing and interpreting patient interview and physical-examination findings;	
ID-2 PC-2.2.	**knows: the physiology and pathophysiology underlying the development of the principal clinical symptoms and syndromes, and methods for confirming their presence;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: analyze clinical data obtained during patient examination from the standpoint of pathophysiological processes;	
	has skills in: formulating a preliminary diagnosis and preparing a patient investigation plan in accordance with current medical-care procedures and clinical guidelines;	
ID-3 PC-2.3.	**knows: the physiology and pathophysiology underlying comorbid conditions;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: determine indications for specialist consultation and specialized inpatient medical care;	
ID-4 PC-2.4.	**knows: the pathophysiology underlying the development of the principal clinical symptoms and syndromes;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: interpret interview and physical-examination findings and laboratory, instrumental, and other morphological investigation data in order to establish a diagnosis;	
	has skills in: performing differential diagnosis of the principal clinical syndromes;	
ID-5 PC-2.5.	**knows: the physiology and pathophysiology underlying the principal clinical symptoms and syndromes; methods for confirming their presence; and the main approaches to pathogenetic treatment of internal diseases;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: analyze all clinical, laboratory, and instrumental data obtained during patient examination from the standpoint of pathophysiological processes and formulate a clinical diagnosis in accordance with the International Statistical Classification of Diseases and Related Health Problems;	
	has skills in: establishing a clinical diagnosis in pathological conditions and common internal diseases in accordance with the International Statistical Classification of Diseases and Related Health Problems;	

ID-1 PC-3.1.	**knows: management strategies for patients with various internal diseases; therapeutic treatment programs for internal diseases; and the algorithm for selecting medicines and non-pharmacological treatment methods depending on the diagnosis and individual patient characteristics;** indications and contraindications for the use of medicinal products	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: assess the patient's condition, prescribe appropriate treatment, predict the course of the disease, and evaluate the beneficial and adverse effects of medicines used to treat internal diseases;	
	has skills in: prescribing appropriate treatment consistent with the established diagnosis and selecting pharmacological and non-pharmacological therapy for patients with the most common internal diseases;	
ID-1 PC-5.1.	**knows: indications for referral to a specialist for the prescription and implementation of medical rehabilitation and/or health-resort treatment;**	– test questions, – test tasks, – situational tasks – written report – student case history
	is able to: identify and refer patients requiring medical rehabilitation to a specialist for the prescription and implementation of medical rehabilitation and/or health-resort treatment in accordance with current medical-care procedures, clinical guidelines (treatment protocols), and standards of medical care;	

2. Examples of assessment tools and assessment criteria for ongoing monitoring

2.1. Examples of incoming control

1. What does the term 'acute coronary syndrome' mean?
2 Why does sudden coronary-artery occlusion occur in myocardial infarction?
3 Can myocardial infarction develop from a cause other than ischemic heart disease?
4 Is there a difference in thrombus composition between ST-elevation and non-ST-elevation myocardial infarction?
5. How long does myocardial necrosis take to develop during ischemia?

Evaluation criteria, grading scale pass/fail

Rating	Description
"passed"	Demonstrates a complete understanding of the problem. All task requirements are met.
"not accepted"	Demonstrates no understanding of the problem. Many task requirements are not met. No answer is provided and no attempt is made.

2.2. Examples of test tasks:

ID-1 PC-2.1.
Question name: Question No. 1

A 55-year-old man sought medical care for retrosternal pain radiating to the left shoulder. The pain depends on body position and increases when sitting and leaning forward; body temperature is 37.7°C. Examination: skin of normal color, dry and clean; BP 140/90 mmHg; pulse symmetrical and regular. CBC: WBC 12.0×10^9/L, RBC 4.5×10^{12}/L, Hb 130 g/L, ESR 45 mm/h. ECG: ST elevation in leads I, II, aVL, aVF, and V3–V6. Cardiac-specific markers are normal. Auscultation reveals a pericardial friction rub and isolated dry wheezes. What is the preliminary diagnosis? {

~ infective endocarditis

~ acute rheumatic fever
= acute pericarditis
~ pneumonia

ID-2 PC-2.2.
Question name: Question No. 2

A 17-year-old man developed palpitations, exertional dyspnea, and low-grade fever two weeks after a nasopharyngeal infection. Examination: normal build; clear skin; no lymphadenopathy; musculoskeletal system unremarkable; vesicular breath sounds without wheezing; respiratory rate 18/min. The left cardiac border is displaced 1.5 cm to the left. The first apical heart sound is diminished; a non-radiating systolic murmur and a third heart sound are heard. Heart rate 88/min, regular; BP 110/70 mmHg. The liver is at the costal margin. No dysuria. ECG: normal electrical axis, sinus tachycardia, PQ prolongation to 0.22 s. What is the preliminary diagnosis? {

= viral myocarditis
~ neurocirculatory dystonia, cardiac type
~ acute rheumatic fever
~ diphtheria

ID-3 PC-2.3.
Question title: Question No.

A 50-year-old male accountant presented to an outpatient physician with severe constricting retrosternal pain radiating to the left shoulder and epigastrium. This was the first episode and began on his way to work. Past history: pneumonia; smoker; no alcohol abuse. Examination: overweight; pale, moist skin; lip cyanosis; vesicular breath sounds without wheezing; pulse 92/min, regular and adequately filled; BP 155/80 mmHg. Cardiac borders: right at the right sternal edge, left 1 cm lateral to the left midclavicular line. Heart sounds are muffled, with no murmurs. Abdomen is soft and non-tender; liver and spleen are not palpable. What is the preliminary diagnosis? {

= ischemic heart disease: acute coronary syndrome
~ pneumothorax
~ acute abdomen
~ degenerative spine disease: cervical and thoracic osteochondrosis

ID-4 PC-2.4.
Question title: Question No.

A 72-year-old patient was admitted to intensive care with prolonged anginal pain, nausea, and vomiting. History: long-standing ischemic heart disease, class II exertional angina, hypertension, and type 2 diabetes mellitus. Symptoms worsened suddenly with constricting, pressing retrosternal pain, vomiting, and cold sweat. ECG: heart rate 40/min, ST elevation in leads I, III, and aVF, with dropped QRS complexes not preceded by QT prolongation. What is the diagnosis? {

~ ischemic heart disease: exertional angina
~ hypertension
= myocardial infarction complicated by AV block
~ infective endocarditis

ID-5 PC-2.5.
Question title: Question No.

A 66-year-old man was admitted with persistent dyspnea markedly aggravated by exertion, constant dull pain in the right upper quadrant, leg edema, cough with mucoid sputum, and general weakness. He has had ischemic heart disease for many years and sustained a myocardial infarction two years ago. Examination: temperature 36.4°C; moist skin; edema of the feet and lower legs; acrocyanosis; harsh breath sounds with quiet moist crackles at the bases; respiratory rate 26/min. The

left border of relative cardiac dullness is at the left midclavicular line. Heart sounds are irregular and muffled; heart rate 100/min. Tongue has a white coating. Abdomen is soft with mild right-upper-quadrant tenderness. The liver projects 4 cm below the costal margin at the midclavicular line and is mildly tender. What is the most likely reason for admission? {

~ hypothyroidism
= chronic heart failure
~ chronic hepatitis
~ pneumonia

ID-1 PC-3.1.
Question title: Question No.

Medicines used to control heart rate in patients with chronic heart failure and atrial fibrillation include:

= beta-blockers
~ non-dihydropyridine calcium-channel blockers
~ proton-pump inhibitors
~ all of the above

ID-1 PC-5.1.
Question title: Question No.

Which NYHA category applies to a patient with marked limitation of physical activity, in whom activity of lower-than-usual intensity causes symptoms but no symptoms are present at rest? {

~ NYHA functional class I
~ NYHA functional class II
= NYHA functional class III
~ NYHA functional class IV
~ all of the above

Evaluation criteria, grading scale for test tasks

Rating		**Description**
"excellent"	5	Completed in full: 85–100%
"good"	4	Not completed in full: 70–84%
"satisfactory"	3	Completed with deviations: 55–69%
"unsatisfactory"	2	Completed partially: 54% or fewer correct answers

2.3. Examples of essay topics

ID-1 PC-2.1.
Whipple endocarditis.
ID-2 PC-2.2.
Acute myocarditis.
ID-3 PC-2.3.
Carcinoid heart disease.
ID-4 PC-2.4.
Constrictive pericarditis.
ID-5 PC-2.5.
Left ventricular noncompaction. Ineffective cardiac resynchronization therapy due to displacement of the left-ventricular lead.
ID-1 PC-3.1.
Hypertrophic cardiomyopathy with severe left ventricular outflow tract obstruction.

ID-1 PC-5.1.
Deep-vein thrombosis of the lower extremities. Acute pulmonary embolism.

Evaluation criteria, abstract grading scale

Rating		Description
"excellent"	5	All requirements for writing and defending an abstract are met: the problem is identified and its relevance is justified, a brief analysis of various points of view on the problem under consideration is made and one's own position is logically presented, conclusions are formulated, the topic is fully disclosed, the scope is maintained, requirements for external design are met, correct answers to additional questions are given
"good"	4	The basic requirements for the abstract and its defense have been met, but there are some shortcomings; in particular, there are inaccuracies in the presentation of the material; there is no logical consistency in judgments; the scope of the abstract is not maintained; there are omissions in design; Incomplete answers were given to additional questions during the defense
"satisfactory"	3	There are significant deviations from the abstracting requirements; in particular: the topic is only partially covered; there were factual errors in the content of the abstract or in answering additional questions; no output during protection
"unsatisfactory"	0	The topic of the abstract is not disclosed, a significant misunderstanding of the problem is revealed, or the abstract is not presented at all

2.4. Examples of review questions

ID-1 PC-2.1.
Central hemodynamics and regulation of cardiac activity.
ID-2 PC-2.2.
Chronic ischemic heart disease. Classification.
ID-3 PC-2.3.
Concepts of stunned and hibernating myocardium and adaptation to intermittent ischemia.
ID-4 PC-2.4.
Angina pectoris. Classification and treatment.
ID-5 PC-2.5.
Antiplatelet therapy for ischemic heart disease.
ID-1 PC-3.1.
Coronary-risk stratification in patients with chronic ischemic heart disease.
ID-1 PC-5.1.
Vasospastic angina.

Evaluation criteria, assessment scale for control questions

Rating		Description
"excellent"	5	Knows all the educational material, understands it perfectly and has thoroughly mastered it. Gives correct, conscious and confident answers to questions (within the program). In oral answers he uses literary correct language and does not make mistakes.
"good"	4	Knows all the required educational material, understands it well and has mastered it firmly. Answers questions (within the program) without difficulty. In oral answers he uses literary language and does not make gross mistakes
"satisfactory"	3	Knows basic educational material. Answers questions (within the limits of the program) with difficulty. In oral answers, he makes mistakes when presenting the material and in constructing his speech.

Rating		Description
"unsatisfactory"	0	Does not know most of the educational material, answers, as a rule, only to the teacher's leading questions, hesitantly. Makes frequent and serious mistakes in oral answers

2.5. Examples of clinical cases

ID-1 PC-2.1. Case No.

A 49-year-old woman was admitted with choking and pressing retrosternal pain occurring with minimal exertion and when supine. During the previous several years, her BP had risen to 150/90 mmHg; she had received no treatment and took no regular medication. On the day before admission, she was in the St. Petersburg metro during a terrorist attack. ECG: sinus tachycardia, 110/min; ST depression in all precordial leads. BP 170/95 mmHg. Bilateral pulmonary crackles extending to the inferior angles of the scapulae; orthopnea. CK-MB twice the upper limit of normal; troponin remained normal three hours after pain onset. Echocardiography: circumferential akinesia of the apical and midventricular segments, hyperkinesia of the basal segments, LVEF 23%, mitral regurgitation grade 0–1. Treatment: morphine 1.0 mg IV; metoprolol 25 mg chewed; isosorbide dinitrate infusion under BP monitoring; furosemide 60 mg; aspirin 250 mg; clopidogrel 75 mg; atorvastatin 80 mg. Emergency coronary angiography was planned. Coronary angiography showed no coronary-artery abnormalities. Ventriculography showed circumferential apical and midventricular akinesia, basal hyperkinesia, and LVEF 24%.

Questions:

1. Formulate the most likely working diagnosis.
2. Assess the treatment being administered. Which prescriptions do you disagree with? Justify your answer.
3. Inotropic treatment was initiated. Despite dopamine infusion at 10 μg/kg/min and furosemide infusion, severe acute heart failure persisted. BP 110/60 mmHg. A new harsh systolic murmur was detected over the precordium. Follow-up echocardiography showed accelerated flow through the left ventricular outflow tract with a maximum gradient of 50 mmHg. What complication developed, and what actions should be taken?
4. List the potential complications of this disease that may present with a newly developed systolic murmur.
5. Describe the prognosis of this disease in most cases. State the nature and expected timing of changes and the possibility of progression or recurrence.

ID-2 PC-2.2. Case No.

A 47-year-old patient at a cardiology appointment reports dyspnea for the last two months, occurring after walking up to 100 m or climbing to the second floor. Height 186 cm, weight 72 kg; asthenic build, dolichocephaly, and pectus carinatum. The first heart sound is diminished. A prolonged blowing diastolic murmur is heard in the third left intercostal space and second right intercostal space. Echocardiography: grade 2 aortic regurgitation; thickened and elongated mitral leaflets; mitral-valve prolapse; grade 1 mitral regurgitation; dilated ascending aorta. LV end-diastolic diameter 60 mm, end-systolic diameter 46 mm, LVEF 50%, indexed end-diastolic volume 84 mL/m², indexed end-systolic volume 42 mL/m²; aortic diameter 50 mm at the sinuses of Valsalva, ascending aorta 50 mm, and aortic arch 30 mm.

Questions:

1. Suggest the most likely diagnosis.
2. Justify your diagnosis.
3. Determine the subsequent treatment strategy.
4. Which assessment of the coronary circulation should be performed beforehand?
5. Is additional examination of the aorta required? If so, which method should be used?

ID-3 PC-2.3. Case No.

A 54-year-old patient reports episodes of palpitations during emotional stress and intermittent pulling pain in the left precordial region during strenuous exercise (cycling events) and at night. He denies syncope, tolerates exercise well, and regularly participates in cycling events. Family history is unremarkable; he does not smoke and is physically active. Examination is normal. BP 120/70 mmHg, heart rate 65/min. Laboratory findings are normal except for the lipid profile: total cholesterol 6.5 mmol/L, LDL-C 3.6 mmol/L, HDL-C 1.5 mmol/L, triglycerides 1 mmol/L. ECG: sinus rhythm 60/min, normal electrical axis, deep negative T waves in V1–V3. Echocardiography: indexed LV volume 56 mL/m², LV mass index 100 g/m², relative wall thickness 0.40, LVEF 70%, left atrial volume index 25 mL/m²; no regional wall-motion abnormalities; estimated pulmonary-artery pressure 20 mmHg and no indirect signs of pulmonary hypertension. In the apical four-chamber view, RV dimensions are 45×70 mm; LV and RV diameters appear equal. TAPSE 26 mm. No signs of right-heart volume overload. Stress echocardiography: rare premature ventricular complexes before exercise, increasing with heart rate; an asymptomatic episode of ventricular bigeminy at peak exercise. The patient achieved 10 METs and stopped because of severe fatigue. The ischemia test was negative. Premature ventricular complexes reappeared during recovery. Holter monitoring: frequent premature ventricular complexes and two episodes of non-sustained ventricular tachycardia.

Questions:

1. Formulate a working diagnosis.
2. Which method will verify the diagnosis?
3. Which findings would support your hypothesis?
4. The diagnosis has been confirmed. Provide recommendations regarding pharmacological treatment and lifestyle modification.
5. List the non-pharmacological methods used for this disease and identify the main indications for each.

ID-4 PC-2.4. Case No.

A 28-year-old patient was admitted with ST-elevation acute coronary syndrome 1.5 hours after pain onset. The patient received morphine 1% 1 mL IV, heparin 4,000 units IV, clopidogrel 300 mg orally, aspirin 250 mg orally, and 150 mL normal saline. ECG: sinus rhythm 45/min, ST elevation in II, III, aVF, and V4R–V6R. Pressing retrosternal discomfort persists. The patient is conscious, lying flat, pale, and diaphoretic, with distended jugular veins. BP 70/30 mmHg, heart rate 44/min. No edema. Breath sounds are present throughout, without crackles. Heart sounds are muffled, with no murmurs. Transfer to the catheterization laboratory is delayed indefinitely for technical reasons.

Questions:

1. Formulate the diagnosis.
2. State the mechanisms causing hypotension in this case.
3. Prescribe treatment aimed at correcting the mechanisms of hypotension you identified. List the symptoms and measurements indicating that IV infusion of crystalloid and plasma-substituting solutions should be stopped.
4. List the symptoms and signs indicating successful reperfusion of the infarct-related artery.
5. Your interventions have achieved the greatest possible success. Is coronary angiography still required? If so, specify when it should be performed.

ID-5 PC-2.5. Case No.

A 70-year-old man presents for an outpatient cardiology assessment without active complaints. He leads an active lifestyle and has no serious chronic diseases. One week earlier he developed an acute respiratory viral infection, and a physician detected a heart murmur. Examination: satisfactory condition; systolic thrill at the base of the heart; harsh systolic ejection murmur, maximal over the aortic valve; second heart sound absent. Other systems are unremarkable. Echocardiography: preserved systolic function; left ventricular hypertrophy (posterior wall and interventricular septum 16 mm); severely calcified aortic valve with restricted opening; maximum gradient 115 mmHg, mean gradient 68 mmHg; calculated aortic-valve area 0.85 cm² or 0.43 cm²/m². Other valves are unremarkable.

Questions:

1. Formulate the complete diagnosis.
2. Justify the severity of the valvular defect.
3. Determine and justify the patient-management strategy.
4. State the preferred type of operation.

5. Name the medicine(s) that must be prescribed after surgical implantation of an aortic bioprosthesis and after transcatheter implantation of an aortic bioprosthesis.

ID-1 PC-3.1. Case No.

A 48-year-old man presented to an outpatient clinic with intermittent episodes of irregular palpitations lasting up to 2–3 hours and accompanied by discomfort in the left chest. This is his first medical visit for the problem. He occasionally records BP up to 160/100 mmHg and takes nifedipine. His father died of myocardial infarction at age 56. He has smoked one pack per day for about ten years. Examination: satisfactory condition; normal skin color and moisture; normosthenic build; BMI 23 kg/m²; regular pulse 68/min; BP 140/90 mmHg. The left cardiac border is at the midclavicular line. The first apical heart sound is preserved, with accentuation of the second sound over the aorta. Vesicular breath sounds. No abdominal abnormalities. CBC and urinalysis are normal; blood glucose 5.2 mmol/L; serum creatinine 73 μmol/L; eGFR (MDRD) 89 mL/min/1.73 m²; LDL-C 3.8 mmol/L. ECG: sinus rhythm 70/min and indirect signs of left ventricular enlargement. Holter monitoring recorded a daytime episode of atrial fibrillation lasting about 30 minutes. Questions:

1. Formulate a preliminary diagnosis.
2. Specify the most appropriate additional investigations.
3. Provide recommendations on lifestyle modification and pharmacological treatment. 4. What is the strategy for prescribing anticoagulants?

5. Are there indications for radiofrequency ablation of the pulmonary-vein ostia?

ID-1 PC-5.1. Case No.

Patient F., aged 72 years, presented with darkening of vision, dizziness, and brief episodes of loss of consciousness during physical exertion; constricting retrosternal pain during brisk walking relieved by nitroglycerin; and dyspnea. He has had ischemic heart disease for seven years and sustained a myocardial infarction one year ago. Over the last several months, dizziness and syncope have developed. Examination: the left border of relative cardiac dullness is displaced 1 cm lateral to the midclavicular line in the fifth intercostal space. The first apical heart sound is diminished and the heart sounds are irregular. Pulse 72/min, BP 110/70 mmHg. ECG: sinus rhythm 74/min, a single monomorphic premature ventricular complex, and complete left bundle branch block (QRS 0.14 s). Echocardiography: LVEF 56%. CBC and urinalysis are normal. Fasting glucose 5.3 mmol/L, LDL-C 2.5 mmol/L, HDL-C 0.8 mmol/L, triglycerides 1.2 mmol/L.

Questions:

1. What is the likely cause of the syncopal episodes?
2. Formulate the diagnosis.
3. Specify the most appropriate additional investigations.
4. Based on the available data, what adjustment to pharmacological treatment is required?
5. Are coronary angiography and revascularization indicated in this case? Justify your answer.

Assessment criteria and grading scale for clinical cases

Rating		**Description**
"excellent"	5	The solution is explained in detail, consistently, and accurately, with theoretical justification, the necessary diagrams and visual demonstrations, and correct, fluent use of terminology. Answers to additional questions are correct and clear.

"good"	4	The solution is detailed but not sufficiently logical, with isolated errors in detail and some difficulty with theoretical justification, diagrams, and visual demonstrations. Answers to additional questions are correct but insufficiently clear.
"satisfactory"	3	The explanation is incomplete and inconsistent, contains errors, and has weak theoretical justification. There are significant difficulties and errors in diagrams and visual demonstrations. Answers to additional questions are insufficiently clear and contain errors in detail.
"unsatisfactory"	2	The explanation is incomplete and inconsistent, contains major errors, and lacks theoretical justification. The student is unable to provide diagrams and visual demonstrations, or makes numerous errors. Answers to additional questions are incorrect or absent.

2.6. Student case history (outline)

ID-1 PC-2.1, ID-2 PC-2.2, ID-3 PC-2.3, ID-4 PC-2.4, ID-5 PC-2.5, ID-1 PC-3.1, ID-1 PC-5.1.

Title page (separate page)

1. Patient identification data.
2. Complaints: principal complaints and those elicited by system review.
3. History of the principal and comorbid diseases.
4. Personal and social history.
5. Objective-examination findings.
6. Justification and formulation of the preliminary diagnosis.
7. Investigation plan.
8. Laboratory and instrumental investigation data and specialist opinions.
9. Final clinical diagnosis (justification and formulation).
10. Differential diagnosis.
11. Etiology and pathogenesis (academic case history only).
12. Pathomorphological changes in organs (academic case history only).
13. Treatment of the principal disease (academic case history only).
14. Treatment of the patient and its justification.
15. Prognosis.
16. Prevention (primary and secondary).
17. Discharge summary.
18. Daily progress notes.
19. References.

Assessment criteria and grading scale for the case history

Rating		**Description**
"excellent"	5	All requirements for writing and defending the case history have been met.
"good"	4	The principal requirements for the case history and its defense have been met, but there are deficiencies, including inaccuracies in the presentation, lack of logical sequence, failure to observe the required length, and formatting

Rating		Description
		omissions. Answers to additional questions during the defense are incomplete.
"satisfactory"	3	There are substantial departures from the case-history requirements: the topic is addressed only partially and the diagnosis is formulated incorrectly. Answers to additional questions during the defense are incomplete.
"unsatisfactory"	2	A substantial misunderstanding of the problem is demonstrated, or the case history is not submitted.

3. Ongoing assessment procedure

Ongoing assessment in the discipline is conducted through review questions, test items, clinical cases, defense of a written report, and preparation of a student case history.

4. Examples of assessment tools and assessment criteria for intermediate certification

4.1. Indicative list of review questions for the pass/fail assessment:

ID-1 PC-2.1.
Dyslipoproteinemias. Classification. Etiology. Principles of treatment.
ID-2 PC-2.2.
Laboratory and instrumental diagnosis of atherosclerosis.
ID-3 PC-2.3.
Pharmacological treatment of hyperlipidemias.
ID-4 PC-2.4.
Prevention of atherosclerosis.
ID-5 PC-2.5.
Principles of examining patients with arterial hypertension.
ID-1 PC-3.1.
Myocarditis. Etiology. Diagnosis and principles of treatment.
ID-1 PC-5.1.
Atrial tachycardias. Classification, ECG diagnosis, and treatment.

Evaluation criteria, assessment scale for control questions

Rating		Description
"excellent"	5	Knows all the educational material, understands it perfectly and has thoroughly mastered it. Gives correct, conscious and confident answers to questions (within the program). In oral answers he uses literary correct language and does not make mistakes.
"good"	4	Knows all the required educational material, understands it well and has mastered it firmly. Answers questions (within the program) without difficulty. In oral answers he uses literary language and does not make gross mistakes
"satisfactory"	3	Knows basic educational material. Answers questions (within the limits of the program) with difficulty. In oral answers, he makes mistakes when presenting the material and in constructing his speech.
"unsatisfactory"	2	Does not know most of the educational material, answers, as a rule, only to the teacher’s leading questions, hesitantly. Makes frequent and serious mistakes in oral answers

4.2. Examples of clinical cases:

ID-1 PC-2.1. Case No. 1

A 49-year-old woman was admitted with choking and pressing retrosternal pain occurring with minimal exertion and when supine. During the previous several years, her BP had risen to 150/90 mmHg; she had received no treatment and took no regular medication. On the day before admission, she was in the St. Petersburg metro during a terrorist attack. ECG: sinus tachycardia, 110/min; ST depression in all precordial leads. BP 170/95 mmHg. Bilateral pulmonary crackles extending to the inferior angles of the scapulae; orthopnea. CK-MB twice the upper limit of normal; troponin remained normal three hours after pain onset. Echocardiography: circumferential akinesia of the apical and midventricular segments, hyperkinesia of the basal segments, LVEF 23%, mitral regurgitation grade 0–1. Treatment: morphine 1.0 mg IV; metoprolol 25 mg chewed; isosorbide dinitrate infusion under BP monitoring; furosemide 60 mg; aspirin 250 mg; clopidogrel 75 mg; atorvastatin 80 mg. Emergency coronary angiography was planned. Coronary angiography showed no coronary-artery abnormalities. Ventriculography showed circumferential apical and midventricular akinesia, basal hyperkinesia, and LVEF 24%.

Questions:

1. Formulate the most likely working diagnosis.
2. Assess the treatment being administered. Which prescriptions do you disagree with? Justify your answer.
3. Inotropic treatment was initiated. Despite dopamine infusion at 10 μg/kg/min and furosemide infusion, severe acute heart failure persisted. BP 110/60 mmHg. A new harsh systolic murmur was detected over the precordium. Follow-up echocardiography showed accelerated flow through the left ventricular outflow tract with a maximum gradient of 50 mmHg. What complication developed, and what actions should be taken?
4. List the potential complications of this disease that may present with a newly developed systolic murmur.
5. Describe the prognosis of this disease in most cases. State the nature and expected timing of changes and the possibility of progression or recurrence.

ID-2 PC-2.2. Case No. 2

A 47-year-old patient at a cardiology appointment reports dyspnea for the last two months, occurring after walking up to 100 m or climbing to the second floor. Height 186 cm, weight 72 kg; asthenic build, dolichocephaly, and pectus carinatum. The first heart sound is diminished. A prolonged blowing diastolic murmur is heard in the third left intercostal space and second right intercostal space. Echocardiography: grade 2 aortic regurgitation; thickened and elongated mitral leaflets; mitral-valve prolapse; grade 1 mitral regurgitation; dilated ascending aorta. LV end-diastolic diameter 60 mm, end-systolic diameter 46 mm, LVEF 50%, indexed end-diastolic volume 84 mL/m², indexed end-systolic volume 42 mL/m²; aortic diameter 50 mm at the sinuses of Valsalva, ascending aorta 50 mm, and aortic arch 30 mm.

Questions:

1. Suggest the most likely diagnosis.
2. Justify your diagnosis.
3. Determine the subsequent treatment strategy.
4. Which assessment of the coronary circulation should be performed beforehand?
5. Is additional examination of the aorta required? If so, which method should be used?

ID-3 PC-2.3. Case No. 3

A 54-year-old patient reports episodes of palpitations during emotional stress and intermittent pulling pain in the left precordial region during strenuous exercise (cycling events) and at night. He denies syncope, tolerates exercise well, and regularly participates in cycling events. Family history is unremarkable; he does not smoke and is physically active. Examination is normal. BP 120/70 mmHg, heart rate 65/min. Laboratory findings are normal except for the lipid profile: total cholesterol 6.5 mmol/L, LDL-C 3.6 mmol/L, HDL-C 1.5 mmol/L, triglycerides 1 mmol/L. ECG: sinus rhythm

60/min, normal electrical axis, deep negative T waves in V1–V3. Echocardiography: indexed LV volume 56 mL/m², LV mass index 100 g/m², relative wall thickness 0.40, LVEF 70%, left atrial volume index 25 mL/m²; no regional wall-motion abnormalities; estimated pulmonary-artery pressure 20 mmHg and no indirect signs of pulmonary hypertension. In the apical four-chamber view, RV dimensions are 45×70 mm; LV and RV diameters appear equal. TAPSE 26 mm. No signs of right-heart volume overload. Stress echocardiography: rare premature ventricular complexes before exercise, increasing with heart rate; an asymptomatic episode of ventricular bigeminy at peak exercise. The patient achieved 10 METs and stopped because of severe fatigue. The ischemia test was negative. Premature ventricular complexes reappeared during recovery. Holter monitoring: frequent premature ventricular complexes and two episodes of non-sustained ventricular tachycardia.

Questions:

1. Formulate a working diagnosis.
2. Which method will verify the diagnosis?
3. Which findings would support your hypothesis?
4. The diagnosis has been confirmed. Provide recommendations regarding pharmacological treatment and lifestyle modification.
5. List the non-pharmacological methods used for this disease and identify the main indications for each.

ID-4 PC-2.4. Case No. 3

A 28-year-old patient was admitted with ST-elevation acute coronary syndrome 1.5 hours after pain onset. The patient received morphine 1% 1 mL IV, heparin 4,000 units IV, clopidogrel 300 mg orally, aspirin 250 mg orally, and 150 mL normal saline. ECG: sinus rhythm 45/min, ST elevation in II, III, aVF, and V4R–V6R. Pressing retrosternal discomfort persists. The patient is conscious, lying flat, pale, and diaphoretic, with distended jugular veins. BP 70/30 mmHg, heart rate 44/min. No edema. Breath sounds are present throughout, without crackles. Heart sounds are muffled, with no murmurs. Transfer to the catheterization laboratory is delayed indefinitely for technical reasons.

Questions:

1. Formulate the diagnosis.
2. State the mechanisms causing hypotension in this case.
3. Prescribe treatment aimed at correcting the mechanisms of hypotension you identified. List the symptoms and measurements indicating that IV infusion of crystalloid and plasma-substituting solutions should be stopped.
4. List the symptoms and signs indicating successful reperfusion of the infarct-related artery.
5. Your interventions have achieved the greatest possible success. Is coronary angiography still required? If so, specify when it should be performed.

ID-5 PC-2.5. Case No. 5

A 70-year-old man presents for an outpatient cardiology assessment without active complaints. He leads an active lifestyle and has no serious chronic diseases. One week earlier he developed an acute respiratory viral infection, and a physician detected a heart murmur. Examination: satisfactory condition; systolic thrill at the base of the heart; harsh systolic ejection murmur, maximal over the aortic valve; second heart sound absent. Other systems are unremarkable. Echocardiography: preserved systolic function; left ventricular hypertrophy (posterior wall and interventricular septum 16 mm); severely calcified aortic valve with restricted opening; maximum gradient 115 mmHg, mean gradient 68 mmHg; calculated aortic-valve area 0.85 cm² or 0.43 cm²/m². Other valves are unremarkable.

Questions:

1. Formulate the complete diagnosis.
2. Justify the severity of the valvular defect.
3. Determine and justify the patient-management strategy.
4. State the preferred type of operation.

5. Name the medicine(s) that must be prescribed after surgical implantation of an aortic bioprosthesis and after transcatheter implantation of an aortic bioprosthesis.

ID-1 PC-3.1. Case No. 6

A 48-year-old man presented to an outpatient clinic with intermittent episodes of irregular palpitations lasting up to 2–3 hours and accompanied by discomfort in the left chest. This is his first medical visit for the problem. He occasionally records BP up to 160/100 mmHg and takes nifedipine. His father died of myocardial infarction at age 56. He has smoked one pack per day for about ten years. Examination: satisfactory condition; normal skin color and moisture; normosthenic build; BMI 23 kg/m²; regular pulse 68/min; BP 140/90 mmHg. The left cardiac border is at the midclavicular line. The first apical heart sound is preserved, with accentuation of the second sound over the aorta. Vesicular breath sounds. No abdominal abnormalities. CBC and urinalysis are normal; blood glucose 5.2 mmol/L; serum creatinine 73 μmol/L; eGFR (MDRD) 89 mL/min/1.73 m²; LDL-C 3.8 mmol/L. ECG: sinus rhythm 70/min and indirect signs of left ventricular enlargement. Holter monitoring recorded a daytime episode of atrial fibrillation lasting about 30 minutes. Questions:

1. Formulate a preliminary diagnosis.
2. Specify the most appropriate additional investigations.
3. Provide recommendations on lifestyle modification and pharmacological treatment. 4. What is the strategy for prescribing anticoagulants?
5. Are there indications for radiofrequency ablation of the pulmonary-vein ostia?

ID-1 PC-5.1. Case No. 7

Patient F., aged 72 years, presented with darkening of vision, dizziness, and brief episodes of loss of consciousness during physical exertion; constricting retrosternal pain during brisk walking relieved by nitroglycerin; and dyspnea. He has had ischemic heart disease for seven years and sustained a myocardial infarction one year ago. Over the last several months, dizziness and syncope have developed. Examination: the left border of relative cardiac dullness is displaced 1 cm lateral to the midclavicular line in the fifth intercostal space. The first apical heart sound is diminished and the heart sounds are irregular. Pulse 72/min, BP 110/70 mmHg. ECG: sinus rhythm 74/min, a single monomorphic premature ventricular complex, and complete left bundle branch block (QRS 0.14 s). Echocardiography: LVEF 56%. CBC and urinalysis are normal. Fasting glucose 5.3 mmol/L, LDL-C 2.5 mmol/L, HDL-C 0.8 mmol/L, triglycerides 1.2 mmol/L.

Questions:

1. What is the likely cause of the syncopal episodes?
2. Formulate the diagnosis.
3. Specify the most appropriate additional investigations.
4. Based on the available data, what adjustment to pharmacological treatment is required?
5. Are coronary angiography and revascularization indicated in this case? Justify your answer.

Assessment criteria and grading scale for clinical cases

Rating		Description
"excellent"	5	The solution is explained in detail, consistently, and accurately, with theoretical justification, the necessary diagrams and visual demonstrations, and correct, fluent use of terminology. Answers to additional questions are correct and clear.
"good"	4	The solution is detailed but not sufficiently logical, with isolated errors in detail and some difficulty with theoretical justification, diagrams, and visual demonstrations. Answers to additional questions are correct but insufficiently clear.
"satisfactory"	3	The explanation is incomplete and inconsistent, contains errors, and has weak theoretical justification. There are significant difficulties and errors in diagrams and visual demonstrations. Answers to additional questions are insufficiently clear and contain errors in detail.

"unsatisfactory"	2	The explanation is incomplete and inconsistent, contains major errors, and lacks theoretical justification. The student is unable to provide diagrams and visual demonstrations, or makes numerous errors. Answers to additional questions are incorrect or absent.

Evaluation criteria, final grading scale (pass)

Rating	Description
"passed"	Demonstrates a thorough understanding of the problem. Knows the basic concepts within the framework of the issue under discussion, methods of study and their relationship with each other, practical problems and has an idea of promising directions for developing the issue under consideration
"faile"	Demonstrates a lack of understanding of the problem. Does not know the basic concepts, methods of study, within the framework of the issue being discussed, has no idea about the main practical problems

5. Intermediate assessment procedure

Intermediate assessment in the discipline is conducted as a pass/fail assessment. It includes answers to review questions and the solution of clinical cases.