INTERNATIONAL HIGHER SCHOOL OF MEDICINE

Department of Cardiac Surgery and Radiology

SYLLABUS
24 hour ECG and BP monitoring

2025-2026 academic year
for students of medical faculty
5rd course IX semester, group__-
1 credit (30 h, including auditorial 12 h, lectures-6h, self-working – 12 h)

Lecturer: **MD Aidai Pasanova**
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Practical classes: **MD Aidai Pasanova**
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The Syllabus is considered
e meeting of the department of Cardiac Surgery and Radiology
Protocol № 9 dated 15.04.2025
Head of the department _____ I.H. Bebezov

Course Objective: the purpose of the elective course is to acquire and improve students' theoretical knowledge, skills and practical skills in the qualified determination of indications for the appointment of the most common functional research methods in cardiology (Holter ECG monitoring and daily blood pressure monitoring) and the interpretation of the results obtained to determine further diagnostic tactics. as well as therapeutic measures necessary for the professional activity of a doctor.

After study of the discipline the student must:

Know:

• electrocardiographic symptoms and syndromes in various diseases in the clinic of internal diseases;
• mechanisms of occurrence of rhythm and conduction disorders;
• know the technique of recording electrocardiography;
• know the technique of decoding electrocardiograms

Skill:

• apply electrodes to the patient and record an electrocardiogram;
• be able to install a daily ECG and blood pressure monitor;
• be able to decode an electrocardiogram;
• be able to distinguish between electrophysiological syndromes and symptoms in various diseases;
• to assess the severity of electrocardiographic symptoms and syndromes in patients with various diseases.

Attitude:

• The ability to determine indications and contraindications for electrocardiography, daily monitoring of ECG and blood pressure
• the ability to correctly and effectively use electrocardiography, daily monitoring of ECG and blood pressure for diagnosis.

Pre-requisites. To study this academic discipline requires knowledge, skills and abilities, formed by previous disciplines: Macro- and microanatomy, normal physiology, pathology (pathological anatomy, pathological physiology), radiation diagnostics, propaedeutics of internal diseases, internal diseases

Post-requisites. Anesthesiology, intensive care, emergency situations, family medicine, cardiac surgery and invasive diagnostic and treatment methods, Cardiology (residency).

THEMATIC PLAN OF LECTURES

№	Theme of lectures	Hours	Date
1	Clinical aspects of the use of Holter ECG monitoring. Assessment of heart rate variability and its significance. Holter ECG monitoring for the diagnosis of cardiac arrhythmias and conduction disorders.	2	5.09.2025 - 6.09.2025
2	The importance of Holter ECG monitoring in the diagnosis of myocardial ischemia.	2	5.09.2025 - 6.09.2025
3	Clinical aspects of the application and methods of daily blood pressure monitoring. Interpretation of the results and clinical application of 24 hours blood pressure monitoring.	2	5.09.2025 - 6.09.2025
	Total	**6**	5.09.2025 - 6.09.2025

THEMATIC PLAN OF PRACTICAL CLASSES

№	Theme of practical classes	Hours	Date
1.	Programming and installation of the device for Holter ECG monitoring. Evaluation control registrations, patient instruction.	2	8.09.2025 - 9.09.2025
2.	Indications and limitations for Holter ECG monitoring		
3.	Holter ECG monitoring in patients with coronary artery disease (CHD), cardiac arrhythmias and conduction disorders and implanted pacemakers.	2	8.09.2025 - 9.09.2025
4.	Programming and installation of the 24 hours BP monitoring device, carrying out control measurements of blood pressure, instructing the patient. Indications, limitations of 24 hours BP monitoring.	2	8.09.2025 - 9.09.2025
5.	Daily profile, blood pressure variability and clinical significance of 24 hours BP monitoring parameters	2	8.09.2025 - 9.09.2025
6.	Unit control.	2	8.09.2025 - 9.09.2025

	Total	**12**	8.09.2025 - 9.09.2025

THEMATIC PLAN OF INDEPENDENT WORK

№	Theme of independent work	Hours	Date
1.	The history and development of ECG and BP monitoring methods. Principles of operation of modern devices for daily ECG monitoring.	2	8.09.2025 - 9.09.2025
2.	Methods for assessing heart rate variability. The role of monitoring in the diagnosis of arrhythmias and conduction disorders.	2	8.09.2025 - 9.09.2025
3.	The clinical significance of daily blood pressure monitoring. Assessment of circadian rhythms of BP: "dippers" and "non-dippers".	2	8.09.2025 - 9.09.2025
4.	Comparison of oscillometric and auscultative blood pressure measurement methods. Preparation of the patient for daily monitoring of ECG and blood pressure.	2	8.09.2025 - 9.09.2025
5.	Indications and contraindications for daily monitoring of ECG and blood pressure.	2	8.09.2025 - 9.09.2025
6.	Errors and artifacts in daily monitoring of ECG and blood pressure: their causes and elimination.	2	8.09.2025 - 9.09.2025
	Total	**12**	

Recommended reading for the discipline:
Basic

№	**The authors**	**The title**	**Year**	**Publishing house**	**Availability of the IHSM (quantity)**
1	Editor: Galen S. Wagner MD & David G. Strauss MD PhD	Practical Electrocardiography	2021	1. Wolters Kluwer, Philadelphia, MD, 13th Edition,	Electronic library
2	Archith Boloor	ABC of ECG: From Basics to Bedside	2024	2. Jaypee Brothers, 1st Edition,	Electronic library

Additional literature

№	The authors	The title	Year	Publishing house	Availability of the IHSM (quantity)
1	Taha Othmane, Omar El Hadj Othmane	Ambulatory Holter ECG Monitoring: Practical Insights	2024	Draft2Digital	Electronic library
2	Shirley A. Jones	ECG Notes: Interpretation and Management Guide	2015	F. A. Davis Company	Electronic library
3	Julian Segura	Hypertension and 24-Hour Ambulatory Blood Pressure Monitoring	2019	Springer	Electronic library

Resources of the information and telecommunication network "Internet"

1. Electronic library of the ISM
2. https://pmc.ncbi.nlm.nih.gov/articles/PMC7147367/
3. https://www.ahajournals.org/doi/10.1161/01.cir.93.5.1043
4. https://pmc.ncbi.nlm.nih.gov/articles/PMC10947115/
5. https://pubmed.ncbi.nlm.nih.gov/10226224/
6. https://jchm.in/archive/volume/11/issue/4/article/14208#article
7. https://pmc.ncbi.nlm.nih.gov/articles/PMC6932211/

Grading policy and procedures for all types of work

For the period of studying the discipline, the student gains points for the relevant parameters (per unit):
current score - 40 points
independent work - 20 points
control score (final assessment of knowledge per unit) - 40 points
Maximum score - 100 (40+20+40)

Grading system for student's achievements

Grading criteria per discipline				
Maximum score	Intervals			
	«unsatisfactory»	«satisfactory»	«good»	«excellent»
Current control- 40	0-23	24-30	31-35	36-40
Interval description	Not ready for class	Passive, does not participate in the discussion of the topic of the lesson	Actively participates in the discussion of the topic of the lesson, periodically gets confused in details.	Actively participates in the discussion of the topic of the lesson, gives a complete accurate answer to the question.
Independent work - 20	0-11	12-15	16-17	18-20
Interval description	Does not answer questions about the topic. There is no presentation	Has difficulty answering, doesn't know the topic well; The content of the presentation partially corresponds to the stated topic; sometimes the sequence of presentation is disrupted; illustrative material often does not correspond to the content and is of poor quality, and is not fully presented.	Answers well, but sometimes gets confused in some answers.; the content of the presentation corresponds to the stated topic; it is clear, intelligible and consistent; the illustrative material is of good quality, but does not always correspond to the content: quantity	Confident, complete answer, shows good knowledge of the topic, does not get confused in the answers; the content of the presentation corresponds to the stated topic; clearly, clearly and consistently stated; illustrative material of good quality, presented in full.
Control work (module) – 40	0-23	24-30	31-35	36-40
Interval description	Does not answer questions; testing corresponds to the results of less than 60% of correct answers.	Has difficulty answering, doesn't know the answer well; testing corresponds to results from 60% to 75% of correct answers.	Answers well, sometimes gets confused in some answers; test results correspond from 76% to 89% of correct answers	Answers all questions correctly, completely. Does not get confused in the answers; testing corresponds to the results of 90% or more correct answers.

Conduct Policy: (lateness, absence, behavior in the auditorium, late submission of work).

- Punctuality and completion of tasks.
- Mandatory attendance of classes.
- Attending class in a clean medical uniform.
- Eliminating conversations on a cell phone in the classroom.
- Active participation in the learning process.
- Doing homework on time.
- Academic detention at the time specified by the teacher.

For violations of the Conduct Policy, the total points for discipline might be reduced to 1-10 points.

Academic Ethics Policy.

- Be tolerant, respect the opinions of others.
- Formulate objections in the correct form.

- Constructively support feedback in all classes.
- Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the following: the absence of references when using printed and electronic materials, quotes, thoughts and works of other authors or students.
- Prompting and cheating during tests, exams, classes is unacceptable as well as passing an exam for another student, unauthorized copying of materials.
For violations of the Academic Ethics Policy, the total points for the discipline may be reduced to 1-10 points.

Guidelines for the lessons of the discipline

Practical lesson number 1. Programming and installation of the device for Holter ECG monitoring. Evaluation control registrations, patient instruction.

Key questions covered in lesson 1. Types of Holter ECG devices. Registration. Electrocardiographic leads. Standard leads. Thoracic leads. Additional leads. Application of electrodes. Patient instruction

Recommended reading for the lesson:

1)Galen S. Wagner MD & David G. Strauss MD PhD, Practical Electrocardiography, 2021Wolters Kluwer, Philadelphia, MD, 13th Edition, 2)Massimo Romano Text Atlas of Practical Electrocardiography: A Basic Guide to ECG Interpretation - 2015Springer, California, MD, 5th Edition

Practical lesson number 2. Indications and limitations for Holter ECG monitoring.

Key questions covered in lesson 2. Indications and limitations for patients with Holter ECG.

Recommended reading for the lesson:

1)Galen S. Wagner MD & David G. Strauss MD PhD, Practical Electrocardiography, 2021Wolters Kluwer, Philadelphia, MD, 13th Edition, 2)Massimo Romano Text Atlas of Practical Electrocardiography: A Basic Guide to ECG Interpretation - 2015Springer, California, MD, 5th Edition

Practical lesson number 3. Holter ECG monitoring in patients with coronary artery disease (CHD), cardiac arrhythmias and conduction disorders and implanted pacemakers. Key questions covered in lesson 3. Types of rhythm disorders (atrial, ventricular extrasystoles). Blocks. Atrial fibrillation and flutter. Electrocardiogram for coronary heart disease. Types of cardiac pacemakers.

Recommended reading for the lesson:

1)Galen S. Wagner MD & David G. Strauss MD PhD, Practical Electrocardiography, 2021Wolters Kluwer, Philadelphia, MD, 13th Edition, 2)Massimo Romano Text Atlas of Practical Electrocardiography: A Basic Guide to ECG Interpretation - 2015Springer, California, MD, 5th Edition

Practical lesson number 4. Programming and installation of the 24 hours BP monitoring device, carrying out control measurements of blood pressure, instructing the patient. Indications, limitations of 24 hours BP monitoring. Key questions covered in lesson 4. Types of BP monitoring devices. Degrees of BP. BP monitoring: recording technique, indications.

Recommended reading for the lesson:

1)Galen S. Wagner MD & David G. Strauss MD PhD, Practical Electrocardiography, 2021Wolters Kluwer, Philadelphia, MD, 13th Edition, 2)Massimo Romano Text Atlas of Practical Electrocardiography: A Basic Guide to ECG Interpretation - 2015Springer, California, MD, 5th Edition

Practical lesson number 5. Daily profile, blood pressure variability and clinical significance of 24 hours BP monitoring parameters. Key questions covered in lesson 5. The concept of daily profile, blood pressure variability, result interpretation. Recommended reading for the lesson:

1)Galen S. Wagner MD & David G. Strauss MD PhD, Practical Electrocardiography, 2021Wolters Kluwer, Philadelphia, MD, 13th Edition, 2)Massimo Romano Text Atlas of Practical Electrocardiography: A Basic Guide to ECG Interpretation - 2015Springer, California, MD, 5th Edition

Practical lesson number 6. - 1st unit control. Programming and installation of the device for Holter ECG monitoring. Evaluation control registrations, patient instruction. Indications and limitations for Holter ECG monitoring. Holter ECG monitoring in patients with coronary artery disease (CHD), cardiac arrhythmias and conduction disorders and implanted pacemakers. Programming and installation of the 24 hours BP monitoring device, carrying out control measurements of blood pressure, instructing the patient. Indications, limitations of 24 hours BP monitoring. Daily profile, blood pressure variability and clinical significance of 24 hours BP monitoring parameters.

Methodological instructions for the implementation of independent work on the discipline.

- Working with literature (basic and additional literature)
- The study of electrocardiograms, daily ECG data and blood pressure in patients in the clinic (analysis and interpretation of the diagnosis).
- Solving situational problems (each student must solve 1 situational problem individually)

- Each student is provided with an individual independent work, that needs to be completed. The work should be presented on A4 paper in a printed (computer) version. Font: Times New Roman, font size - 12, number of pages 8-10 sheets. The structure of independent work: 1. Title page; 2. Contents; 3. Introduction; 4. Main part; 5. Conclusion; 6. List of sources used; 7. Appendices (if necessary).