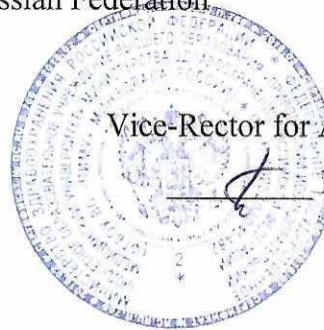


Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation



APPROVED

Vice-Rector for Academic Affairs

E.S. Bogomolova

31 August 2021

WORKING PROGRAM

Name of the academic discipline: **ECG AND OTHER FUNCTIONAL EXAMINATION METHODS IN THE CLINIC FOR INTERNAL MEDICINE**

Specialty: **31.05.01 GENERAL MEDICINE**
(code, name)

Qualification: **GENERAL PRACTITIONER**

Department: **ENDOCRINOLOGY AND INTERNAL DISEASES**

Mode of study: **FULL-TIME**

Labor intensity of the academic discipline: **72 academic hours**

Nizhny Novgorod
2021

The working program has been developed in accordance with the Federal State Educational Standard for the specialty 31.05.01 General Medicine, approved by Order of Ministry of Education and Science of the Russian Federation No. 988 dated 12.08.2020.

EXAMPLE: The working program has been developed in accordance with the Federal State Educational Standard for specialty 31.05.01 GENERAL MEDICINE approved by Order of the Ministry of Science and Higher Education of the Russian Federation No. 988 of August 12, 2021.

Developers of the working program:

Full name, academic degree, title, position.

The program was reviewed and approved at the department meeting (protocol No.4, 21.04.22)
Head of the Department, Doctor of Medical Sciences, Associate Professor Pochinka I.G.


21/04/2021



(signature)

AGREED

Deputy Head of EMA ph.d. of biology _____ Lovtsova L.V.



(signature)

21/04/2021

1. The purpose and objectives of mastering the academic discipline «Functional diagnostic» (hereinafter – the discipline):

1.1. The purpose of mastering the discipline: to master the modern methods of functional diagnostic (PC-6).

1.2. Tasks of the discipline:

1. To master principles of registration and interpretation of the electrocardiogram (ECG)
2. To study the methods of Holter ECG -monitoring and ambulatory blood pressure monitoring
3. To form a view about analysis of heart rate variability,
4. To study the basics of the study of function external respiration

1.3. Requirements to the deliverables of mastering the discipline

As a result of completing the discipline, the student should

Know:

1. The methods for studying the cardiovascular system and organs breathing
2. The modern possibilities of functional diagnostics and principles of working with diagnostic equipment
3. The fundamentals of electrocardiographic diagnostics.
4. The methodology for daily monitoring of ECG and arterial pressure.
5. The methodology and principles of analysis of heart rate variability.
6. The fundamentals of the study of the function of external respiration.

Be able to:

1. To determine the indications for an electrocardiographic study, daily monitoring of ECG and blood pressure, spirometry.
2. To register and interpret the electrocardiogram.
3. To prepare for operation devices for monitoring ECG and arterial pressure.
4. To prepare a protocol for daily monitoring of ECG and blood pressure.
- 5 To prepare the spirograph for operation and conduct a study of the function of the external breathing, interpret the results.

Possess:

1. The skills of working with an electrocardiograph:
 - turning on the device, setting the recording parameters;
 - the location of the electrodes on the patient's body;
2. Principles of interpreting an electrocardiogram and writing a conclusion.
3. The methodology for conducting and evaluating the results of daily ECG monitoring and blood pressure.
4. The method of spirometry, the diagnosis of obstructive and restrictive abnormalities

2. Position of the academic discipline in the structure of the General Educational Program of Higher Education (GEP HE) of the organization.

2.1. The discipline "Functional diagnostic" refers to the part formed by the participants of educational relations of Block 1 of GEP HE specialty 31.05.01 "Medicine".

The discipline is taught in 7 semester/ 4 year of study.

2.2. The following knowledge, skills and abilities formed by previous academic disciplines are required for mastering the discipline:

1. Normal and pathological anatomy
2. Normal and pathological physiology
3. Medical physics
4. Histology
5. Propaedeutics of internal diseases

2.3. Mastering the discipline is required for forming the following knowledge, skills and abilities for subsequent academic disciplines:

1. The faculty therapy and occupational diseases
2. The hospital and polyclinic therapy
3. Practice «Hospital doctor's assistant» and «Physician's assistant outpatient clinic»

3. Deliverables of mastering the academic discipline and metrics of competence acquisition

Mastering the discipline aims at acquiring the following universal (UC) or/and general professional (GPC) or/and professional (PC) competencies

№	Competence code	The content of the competence (or its part)	Code and name of the competence acquisition metric	As a result of mastering the discipline, the students should:		
				know	be able to	possess
1.	PC-6	To be able to refer the patient for laboratory, instrumental examination, for consultation with specialist doctors if there are medical indications in accordance with the current procedures for the provision of medical care, clinical recommendations (treatment protocols) on the provision of medical care, taking into account the standards of medical care, and refer the patient for specialized medical care in an inpatient setting or in a day hospital if there are medical	IPC-6.1 Know: general organization issues of medical care population methods of laboratory and instrumental research to assess the state of health, medical indications for research, rules of their interpretation and results; orders of medical care, clinical recommendations (treatment protocols) on the provision of medical care, medical standards help IPC-6.2 To be able to: substantiate the need and scope of laboratory examination of the	Functional methods for studying the cardiovascular system and respiratory organs Modern possibilities of functional diagnostics and principles of working with diagnostic equipment Fundamentals of electrocardiographic diagnostics The method of	Determine the indications for an electrocardiographic study, daily monitoring of the ECG and blood pressure, spirometry. Record and interpret the electrocardiogram. Prepare devices for monitoring ECG and blood pressure. Draw up a protocol for daily monitoring of ECG and blood pressure.	Electrocardiograph skills: - turning on the device, setting the recording parameters; - the location of the electrodes on the patient's body; Principles of interpreting an electrocardiogram and writing a conclusion. The methodology for conducting and evaluating

	indications in accordance with the current procedures for the provision of medical care, clinical guidelines (treatment protocols) on the provision of medical care, taking into account the standards medical care	patient; substantiate need and scope instrumental examination of the patient; substantiate need referral of the patient for consultations with medical specialists; define medical indications for rendering ambulance, including emergency specialized medical care	daily monitoring of ECG and blood pressure. Methodology and principles of analysis of heart rate variability. Fundamentals of the study of the function of external respiration	Prepare the spiograph for work and conduct a study of the function of external respiration, interpret the results.	the results of daily monitoring of ECG and blood pressure. The method of spirometry, the diagnosis of obstructive and restrictive disorders of the function of external respiration.
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4. Sections of the academic discipline and competencies that are formed when mastering them

№	Competence code	Section name of the discipline
1	PC-6	Principles of registration and interpretation of electrocardiogram.
2	PC-6	Technique of monitoring of ECG and blood pressure
3	PC-6	Technique of analyzing heart rate variability
4	PC-6	Fundamentals of spirometry

5. Volume of the academic discipline and types of academic work

Type of educational work	Labor intensity		Labor intensity (AH) in semesters
	volume in credit units (CU)	volume in academic hours (AH)	
			7
Classroom work, including	1	22	22
Lectures (L)	0,11	4	4
Laboratory practicum (LP)*	-	-	-
Practicals (P)	0,5	18	18
Seminars (S)	-	-	-
Student's individual work (SIW)	0,39	14	14
Mid-term assessment			
credit/exam (<i>specify the type</i>)		credit	credit
TOTAL LABOR INTENSITY	1	36	36

6. Content of the academic discipline

6.1. Sections of the discipline and types of academic work

№	Name of the section of the academic discipline	Types of academic work* (in AH)					
		L	LP	P	S	SIW	total

1	Principles of registration and interpretation of the electrocardiogram	2					2
2	Methods of investigation of function of external respiration	2					2
3	Electrocardiographic diagnosis of rhythm and conduction disorders			6		4	10
4	Electrocardiographic diagnosis of coronary heart disease.			4		4	8
5	Analysis of heart rate variability			2		2	4
6	Technique for daily monitoring of ECG and blood pressure.			6		4	10
	TOTAL	4		18		14	36

* - L – lectures; LP – laboratory practicum; P – practicals; S – seminars; SIW – student's individual work.

6.2. Thematic schedule of educational work types:

6.2.1 Thematic schedule of lectures

№	Name of lecture topics	Volume in AH
		semester 7
	Principles of registration and interpretation of the electrocardiogram.	2
	Methods of investigation of function of external respiration.	2
	TOTAL (total - AH)	4

6.2.2. Thematic plan of practicals

№	Name of laboratory practicums	Volume in AH
		semester 7
	Electrocardiographic diagnosis of rhythm and conduction disorders	6
	Electrocardiographic diagnosis of coronary heart disease.	4
	Analysis of heart rate variability	2
	Technique of daily monitoring of ECG and blood pressure.	6
	TOTAL (total - AH)	18

6.2.3. Types and topics of student's individual work (SIW)

№	Types and topics of SIW	Volume in AH
		semester 7
	Electrocardiographic diagnosis of rhythm and conduction disorders.	4

	Electrocardiographic diagnosis of coronary heart disease.	4
	Analysis of heart rate variability	2
	Technique of daily monitoring of ECG and blood pressure.	2
	TOTAL (total - AH)	14

7. Types of assessment formats for ongoing monitoring and mid-term assessment

№	Semester No.	Types of control		Name of section of academic discipline	Competence codes	Assessment formats		
						types	number of test questions	number of test task options
1.		Current monitoring	Control of mastering the topic	Principles of registration and interpretation of the electrocardiogram	PC-6	Test	15	3
				Methods of investigation of function of external respiration		Test	15	3
				Electrocardiographic diagnosis of rhythm and conduction disorders		Test	15	3
				Electrocardiographic diagnosis of coronary heart disease.		Test	15	3
				Analysis of heart rate variability		Test	15	3
				Technique for daily monitoring of ECG and blood pressure.		Test	15	3
		Monitoring the student's individual work	Electrocardiographic diagnosis of rhythm and conduction disorders.	PC-6	Case	4	6	
					Case	4	6	

2.	Mid-term assessment	Exam/ Credit	Credit		Final test	20	6
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8. Educational, methodological and informational support for mastering the academic discipline (printed, electronic publications, the Internet and other network resources)

8.1. Key literature references

№	Name according to bibliographic requirements	Number of copies	
		at the department	in the library
1	Interpretation of ECG data = Интерпретация ЭКГ- данных : textbook for the international english speaking medical students / E. A. Grunina, E. P. Morozova, T. A. Nekrasova [et al.] ; Nizhny Novgorod State Medical Academy, . - 2nd ed. - N. Novgorod : Publishing House of NNSMA, 2014. - 68 p. : ил.	-	11
2	Practical aspects of spirometry : textbook for the overseas medical students / S. N. Botova, K. G. Korneva, E. P. Morozova [et al.] ; Nizhny Novgorod State Medical Academy, . - N. Novgorod : Publishing House of NNSMA, 2015. - 56 p.	-	1
3	Harrison's principles of internal medicine / ed. J. Jameson, D. L. Kasper, D.I. Longo, A. S. Fauci, S.I. Hauser, J. Loscalzo. - 20th ed. - New York : McGraw-Hill Higher Education, 2018. Vol. 1 : Harrison's principles of internal medicine / ed. J. Jameson, D. L. Kasper, D.I. Longo, A. S. Fauci, S.I. Hauser, J. Loscalzo. - New York : McGraw-Hill Higher Education, 2018. - 20th ed. - XLI, 1647 p., I-214 : ill. - ISBN 9781259644030. Vol. 2 : Harrison's principles of internal medicine / ed. J. Jameson, D. L. Kasper, D.I. Longo, A. S. Fauci, S.I. Hauser, J. Loscalzo. - New York : McGraw-Hill Higher Education, 2018. - XLI, 3528 p., I-214 : ill. - ISBN 978-1-259-64403-0.	-	1

8.2. Further reading

№	Name according to bibliographic requirements	Number of copies	
		at the department	in the library
1	Hampton, J. R. The ECG made easy / J. R. Hampton ; Hampton, John R. - 7th ed. - Edinburgh : Churchill Livingstone, 2008. - 179 с. : ил. мяг. - ISBN 978-0-443-06826-3.	-	11
2	Hampton, J. R. 150 ECG problems / J. R. Hampton ; Hampton, John R. - 2nd ed. - Churchill Livingstone, 2003. - 309 с. : мяг. - ISBN 0-443-07248-5.	-	5
3	Bowbrick, S. ECG complete / S. Bowbrick, A. N. Borg ; Bowbrick S. ; Borg A. N. - Edinburgh : Churchill Livingstone, 2006. - 160 с. : ил. мяг. - ISBN 978-0-443-10183-0.	-	1
4	Braunwald's heart disease : a textbook of cardiovascular medicine / D. P. Zipes ; Zipes Douglas P. - 7th ed. - S.I. : Elsevier Saunders, 2005. - 2183 с. : ил. тв. - ISBN 0-8089-2305-6.	-	10
5	Julian, D. G. Cardiology / D. G. Julian, J. C. Cowan, J.	-	20

	M. McLenachan ; Julian Desmond G. ; Cowan, J. C. ; McLenachan, J. M. - 8th ed. - Elsevier Saunders, 2005. - 387 с. : мяг. - ISBN 0-7020-2694-8.		
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8.3. Electronic educational resources for teaching academic subjects

8.3.1. Internal Electronic Library System of the University (IELSU)

№	Name of the electronic resource	Brief description (content)	Access conditions	Number of users
	Internal electronic library system	Proceedings of the teaching staff of the academy: textbooks and manuals, monographs, collections of scientific papers, scientific articles, dissertations, abstracts of dissertations, patents.	From any computer on the Internet, using an individual login and password [Electronic resource] - Access mode: http://95.79.46.206/login.php	Unlimited

8.3.2. Electronic educational resources acquired by the University

№	Name of the electronic resource	Brief description (content)	Access conditions	Number of users
1	Electronic database "Student Advisor"	Educational literature + additional materials (audio, video, interactive materials, test tasks) for higher medical and pharmaceutical education. Editions are structured by specialties and disciplines in accordance with the current Federal State Educational Standards of Higher Professional Education.	From any computer on the Internet, using an individual login and password [Electronic resource] - Access mode: http://www.studmedlib.ru/	General subscription of PRMU
2	Electronic library system "Bukap"	Educational and scientific medical literature of Russian publishing houses, incl. translations of foreign publications. from any computer located on the Internet by login and password, from the computers of the academy.	Subscribed editions are available for reading. [Electronic resource] - Access mode: http://www.books-up.ru/	General subscription of PRMU
3	"Bibliosearch"	Integrated search service "single window" for electronic catalogs, ELS and full-text databases. The results of a single search in the demo version include documents from domestic and foreign electronic libraries and	For PRMU, access to the demo version of the Bibliosearch is open: http://bibliosearch.ru/pimu .	General subscription of PRMU

		databases available to the university as part of a subscription, as well as from open access databases.		
4	The international scientometric database "Web of Science Core Collection"	Web of Science covers materials on natural, technical, social, and human sciences; takes into account the mutual citation of publications developed and provided by Thomson Reuters; has built-in search, analysis and management of bibliographic information.	Free access from PIMU computers [Electronic resource] - Access to the resource at: http://apps.webofknowledge.com	Free access from PIMU computers

8.3.3 Open access resources

№	Name of the electronic resource	Brief description (content)	Access conditions
1	Federal Electronic Medical Library (FEMB)	Includes electronic analogues of printed publications and original electronic publications that have no analogues recorded on other media (dissertations, abstracts, books, magazines, etc.).	[Electronic resource] - Access mode: http://neb.rf/ from any computer in the Internet
2	Scientific electronic library eLIBRARY.RU	The largest Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of scientific articles and publications.	[Electronic resource] - Access mode: https://elibrary.ru/ from any computer in the Internet.
3	Scientific electronic library of open access CyberLeninka	Full texts of scientific articles with annotations published in scientific journals of Russia and neighboring countries.	[Electronic resource] - Access mode: https://cyberleninka.ru/ from any computer in the Internet
4	Russian State Library (RSL)	Abstracts for which there are copyright agreements with permission for their open publication	[Electronic resource] - Access mode: http://www.rsl.ru/ from any computer in the Internet
5	Reference system "Consultant Plus"	Federal and regional legislation, judicial practice, financial advice, legal comments, etc.	[Electronic resource] - Access mode: http://www.consultant.ru/ from any computer in the Internet
6	Official website of the Ministry of Health of the Russian Federation	National clinical guidelines	[Electronic resource] - Access mode: cr.rosminzdrav.ru - Clinical guidelines from any computer in the Internet

9. Material and technical support for mastering an academic discipline

9.1. List of premises for classroom activities for the discipline

1. 2 classrooms
2. The lecture hall
3. The room of the functional diagnostics

9.2. List of equipment for classroom activities for the discipline

1. *Multimedia projector*
2. *Notebook*
3. *Computer*
4. *Electrocardiograph*
5. *Complex for analysis of heart rate variability*
6. *ECG monitoring complex*
7. *Complex of blood pressure monitoring*
8. *Spirometer*
9. *Medical couch*

9.3. A set of licensed and freely distributed software, including domestic production

Item no.	Software	number of licenses	Type of software	Manufacturer	Number in the unified register of Russian software	Contract No. and date
1	Wtware	100	Thin Client Operating System	Kovalev Andrey Alexandrovich	1960	2471/05-18 from 28.05.2018
2	MyOffice is Standard. A corporate user license for educational organizations, with no expiration date, with the right to receive updates for 1 year.	220	Office Application	LLC "NEW CLOUD TECHNOLOGIES"	283	without limitation, with the right to receive updates for 1 year.
3	LibreOffice		Office Application	The Document Foundation	Freely distributed software	
4	Windows 10 Education	700	Operating systems	Microsoft	Azure Dev Tools for Teaching Subscription	
5	Yandex. Browser		Browser	«Yandex»	3722	
6	Subscription to MS Office Pro for 170 PCs for FGBOU VO "PIMU" of the Ministry of Health of Russia	170	Office Application	Microsoft		23618/HN10030 LLC "Softline Trade" from 04.12.2020

10. List of changes to the working program (to be filled out by the template)

Federal State Budgetary Educational Institution of Higher Education
"Privolzhsky Research Medical University"
Ministry of Health of the Russian Federation
(FSBEI HE "PRMU" of the Ministry of Health of Russia)

Department of
Name of the department

CHANGE REGISTRATION SHEET

working program for the academic discipline
NAME OF THE ACADEMIC DISCIPLINE

Field of study / specialty / scientific specialty: _____ (code, name)

Training profile: _____
(name) - for master's degree programs

Mode of study: _____
full-time/mixed attendance mode/extramural

Position	Number and name of the program section	Contents of the changes made	Effective date of the changes	Contributor's signature
1				

Approved at the department meeting Protocol No4 21/04/2022

Head of the Department
Doctor of Medical Sciences, Associate Professor Pochinka I.G. _____