

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 discipline: **BASICS OF ULTRASOUND DIAGNOSTICS IN THE CLINIC OF INTERNAL DISEASES**

Specialty: **31.05.01 GENERAL MEDICINE**

Qualification: **GENERAL PRACTITIONER**

Department: **ENDOCRINOLOGY AND INTERNAL MEDICINE**

Mode of study: **FULL-TIME**

Nizhny Novgorod

2021

The work program was developed in accordance with the Federal State Educational Standard of Higher Education in the specialty 31.05.01 General Medicine, approved by order of the Ministry of Education and Science of the Russian Federation No. 988 dated August 12, 2020.

The compilers of the work program:

Budkina M.L., Candidate of Medical Sciences, Associate Professor, Associate Professor of the Department of Endocrinology and Internal Diseases

Petrov E.B., Candidate of Medical Sciences, Associate Professor, Associate Professor of the Department of Endocrinology and Internal Diseases

The program was reviewed and approved at a meeting of the department, protocol No. 13 dated 04.06.2021

Head of the Department,
MD, PhD, Associate professor  I.G. Pochinka
(signature)

04.06.2021

AGREED
Deputy Head of EMA ph.d. of biology  Lovtsova L.V.
(signature)

04.06.2021

1. The purpose and objectives of mastering the academic discipline Basics of ultrasound diagnostics in the clinic of internal diseases (hereinafter – the discipline):

1.1. The main goal of mastering and teaching the discipline “Basics of ultrasound diagnostics in the clinic of internal diseases”: to study the principles of work on an ultrasound scanner, various ultrasound diagnostic technologies, to get acquainted with the methodology and basics of ultrasound diagnostics of the abdomen, heart, blood vessels and thyroid gland (PC-6).

1.2. Tasks of the discipline: to study the principles of work on an ultrasound scanner, various ultrasound diagnostic technologies, to get acquainted with the methodology and basics of ultrasound diagnostics of the abdomen, heart, blood vessels and thyroid gland.

1.3. Requirements to the deliverables of mastering the discipline

As a result of completing the discipline, the student should

Know:

1. Physical and technical foundations of ultrasound diagnostics.
2. Indications for various methods of ultrasound diagnostics.
3. Terminology and basic methods of ultrasound diagnostics.
4. Methodology for ultrasound examination of the abdominal organs, heart, blood vessels and thyroid gland.
5. Fundamentals of ultrasound diagnostics of the abdominal organs, heart, blood vessels and thyroid gland.
6. Principles of differential diagnosis of pathology of the abdominal organs, heart, blood vessels and thyroid gland

Be able to:

1. Prepare the ultrasound scanner for work.
2. Select the required probe and examination settings.
3. Determine the indications for an ultrasound examination and write a referral for the study.
4. Write the ultrasound protocol and evaluate the ultrasound pathology of the abdominal cavity, heart, blood vessels and thyroid gland.
5. Follow the safety requirements when working on an ultrasound scanner.

Possess:

1. Skills of working with an ultrasound scanner:
 - switch on the ultrasonic scanner and connecting various probes to it;
 - switching in the course of research of various settings of ultrasonic scanning;

- adjusting the grayscale scanning and Doppler settings and selecting the optimal image parameters.
- 2. Principles of writing an ultrasound protocol.
- 3. Evaluation of the results of ultrasound in the context of the clinical picture.

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 "Ultrasound diagnostics" refers to the part formed by the participants in the educational relations of Block 1 of the BEP HE of the specialist in the specialty 31.05.01 "General Medicine", studied in the 9th semester.

2.2. To study the discipline the following knowledge, skills and abilities are necessary, formed by previous disciplines: normal and pathological anatomy, normal and pathological physiology, histology, propaedeutics of internal diseases.

2.3. Mastering the discipline is required for forming the following knowledge, skills and abilities formed by the subsequent disciplines of the professional cycle: faculty therapy, occupational diseases, hospital therapy, endocrinology; polyclinic therapy; as well as industrial practices: "Physician's assistant", "Physician's assistant in an 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

№	Comp ence code	The content of the competence (or part of it)	Code and name of the competence acquisition metric	As a result of studying the discipline, students should:		
				know	Be able to	possess
1.	PC-6	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	Know: general organization issues medical care population methods laboratory and instrumental research to assess the state of health, medical indications for research, rules their interpretation	Physical and technical bases of ultrasound diagnostics. Indications for various methods of ultrasound diagnostics. Terminology and basic methods of ultrasound diagnostics. Ultrasound	Prepare the ultrasound scanner for work. Select the required ultrasonic transducer and examination mode. Determine the indications for an ultrasound examination and write a referral for the	Ultrasound Scanner Skills: - turning on the ultrasonic scanner and connecting various sensors to it; - switching in the course of research of various modes of ultrasonic scanning; - adjustment

	<p>provision of medical care, taking into account the standards</p> <p>medical care and refer the patient for specialized medical care in an inpatient setting or in a day hospital if there are medical 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</p> <p>medical care</p>	<p>results; orders</p> <p>medical care, clinical recommendations (treatment protocols) on the provision of medical care, medical standards</p> <p>help</p> <p>IPC-6.2 Able to:</p> <p>substantiate the need and scope of laboratory examination of the patient;</p> <p>substantiate need and scope instrumental examination of the patient;</p> <p>substantiate need referral of the patient for consultations with medical specialists;</p> <p>define medical indications for rendering ambulance, including emergency specialized medical care</p>	<p>technique abdominal organs and heart.</p> <p>Fundamentals of ultrasound diagnostics of the abdominal cavity and heart.</p> <p>Principles of differential diagnosis of pathology of the abdominal cavity and heart.</p>	<p>study.</p> <p>Draw up an ultrasound protocol and evaluate the data of ultrasound examination of the abdominal cavity and heart. Comply with safety requirements when working with an ultrasound scanner.</p>	<p>of greyscale scanning and dopplerography settings</p> <p>and selection of optimal image parameters.</p> <p>Principles of writing an ultrasound protocol.</p> <p>Evaluation of the results of ultrasound in the context of the clinical picture.</p>
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1.	9	Physical and technical bases of ultrasound diagnostics. Principles of work on the ultrasonic scanner.	2					2
2.	9	US reports principles and interpretation	2					2
3.	9	Basics of ultrasound diagnosis of diseases of the abdominal cavity and kidneys			6		4	10
4.	9	Basics of ultrasound diagnosis of diseases of the heart			6		4	10
5.	9	Basics of ultrasound diagnosis of diseases of the magistral vessels			3		4	7
6.	9	Basics of ultrasound diagnosis of diseases of the thyroid gland			3		2	5
		ИТОГО	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

п/ №	Name of lecture topics	Volume in AH
		Semester 9
1	Physical and technical bases of ultrasound diagnostics. Principles of work on the ultrasonic scanner.	2
2	US reports principles and interpretation	2
	TOTAL (4 AH)	4

6.2.2. The thematic plan of laboratory practicums: not provided by FGES

6.2.3. Thematic plan of practicals

п/ №	Topics of practicals	Volume in AH
		Semester 9
1	Basics of ultrasound diagnosis of diseases of the abdominal cavity and kidneys	6
2	Basics of ultrasound diagnosis of diseases of the heart	6
3	Basics of ultrasound diagnosis of diseases of the magistral vessels	3
4	Basics of ultrasound diagnosis of diseases of the thyroid gland	3

	TOTAL (18 АЧ)	18

6.2.4. Thematic plan of seminars: not provided by FGES

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

п/ №	Topics of selfstudying	Capacity in AH
		Semester 9
1	Basics of ultrasound report of the abdominal cavity and kidneys	4
2	Basics of ultrasound report of the heart	4
3	Basics of ultrasound report of the magistral vessels	4
4	Basics of ultrasound report of the thyroid gland	2
	TOTAL (total - 14 AH)	14

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

Examples of evaluation tools. MCQ

1. Signs of portal hypertension in its initial stages in the ultrasound image are:

- a) an increase in the size of the liver and spleen with an expansion of the portal vein
- b) a decrease in the size of the liver with an enlarged spleen with a normal state of the portal vein
- c) the normal state of the liver with an increase in the spleen and a decrease in the lumen of the portal vein
- d) an increase in the left lobe of the liver and spleen with an increase in their echogenicity

2. For large-focal myocardial infarction, a violation of local contractility is characteristic in the form of:

- a) hypokinesia
- b) akinesia
- c) dyskinesia
- d) normokinesia

3. The ratio of the lobes of the thyroid gland and the isthmus during ultrasound examination is unchanged in the norm:

- a) equal

- b) the isthmus makes up the bulk of the thyroid gland
- c) the lobes make up the bulk of the gland
- d) everything is wrong

4. With diffuse goiter, the increase in size occurs mainly due to:

- a) share increase
- b) an increase in the isthmus
- c) reduction of the isthmus
- d) share reduction

5. Normally, the following type of blood flow is observed in the arteries of the lower extremities:

- a) trunk
- b) trunk-changed
- c) collateral
- d) no blood flow

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	Boehmeke, T. Pocket atlas of echocardiography / T. Boehmeke, R. Doliva ; Boehmeke Thomas ; Doliva Ralf. - Stuttgart ; New York; London : Thieme : Thieme, 2006. - 225 с. : ил. мяг. - ISBN 3-13-141241-0. http://nbk.pimunn.net/MegaPro/UserEntry?Action=Link_FindDoc&id=26920&idb=0	-	1
2	Davidson's principles and practice of medicine / N. A. Boon, N. R. Colledge, Hunter J. A. A., B. R. Walker ; Boon N. A. ; Colledge N. R. ; Walker B. R. ; Hunter, J. A. A. - 20th ed. - Edinburgh : Churchill Livingstone, 2006. - 1381 с. : ил. мяг. - ISBN 978-0-443-10133-5.	-	4
3	Harrison's principles of internal medicine / ed. J. Jameson, D. L. Kasper,	-	1

	<p>D.I. Longo, A. S. Fauci, S.I. Hauser, J. Loscalzo. - 20th ed. - New York : McGraw-Hill Higher Education, 2018.</p> <p>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.</p> <p>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.</p>		
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**the list of basic literature should contain textbooks published over the past 10 years (for the disciplines of the humanitarian, social and economic cycle over the past 5 years), textbooks published over the past 5 years.*

8.2. Further reading

№	Name according to bibliographic requirements	Number of copies	
		At the department	In the library
1	Sidney K. Edelman , Understanding Ultrasound Physics, Sidney K. Edelman - Esp; 3rd edition (December 31, 2003) 542 pages	-	-
2	Anderson B., Basic to Advanced Clinical Echocardiography: A Self-Assessment Tool for the Cardiac Sonographer / Bonita Anderson, Margaret M. Park – LWW; 1st edition (June 10, 2020) – 650p	-	-
3	Carol M. Rumack, Diagnostic Ultrasound / Carol M.Rumark, Deborah Levine - Elsevier; 5th edition (October 4, 2017) 2-Volume Set - 2658p.	-	-

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 (VEBS)	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

<i>Name of the electronic resource</i>	<i>Brief description (content)</i>	<i>Access conditions</i>	<i>Number of users</i>
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 PIMU
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 PIMU
"Bibliopoisk"	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 databases available to the university as part of a subscription, as well as from open access databases.	For PIMU, access to the demo version of the Bibliopoisk search engine is open: http://bibliosearch.ru/pimu .	General subscription of PIMU
Domestic electronic periodicals	Domestic electronic periodicals	-magazines publishing house "Mediasphere" - from the computers of the library or provided library at the request of the user [Electronic resource] -	Free access from PIMU computers

		Access mode: https://elibrary.ru/	
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

<i>Name of the electronic resource</i>	Brief description (content)	<i>Conditions of access</i>
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.). [Elektronnyi resurs] – Mode of access: http://neb.rf/	from any computer on the Internet
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 on the Internet
Scientific electronic library of open access CyberLeninka	Full texts of scientific articles with annotations, published in scientific journals of Russia and the near abroad. [Electronic resource] – Access mode: https://cyberleninka.ru/	from any computer on the Internet
Russian State Library (RSL)	Avtoreferaty, for which there are author's contracts with permission for their open publication [Electronic resource] – Access mode: http://www.rsl.ru/	from any computer on the Internet
Reference and legal system "Consultant Plus"	Federal and regional legislation, judicial practice, financial consultations, comments on legislation, etc. [Electronic resource] – Access mode: http://www.consultant.ru/	from any computer on the Internet
Official website of the Ministry of Health of the Russian Federation	National clinical recommendations [Electronic resource] – Access mode: cr.rosminzdrav.ru - Clinical recommendations	from any computer on the Internet

Official websites of the Russian Respiratory Society, the Russian Society of Cardiology	Modern materials and clinical recommendations for the diagnosis and treatment of respiratory diseases, cardiovascular diseases [Electronic resource] – Access mode: www.spulmo.ru – Russian Respiratory Society www.scardio.ru – RSC	from any computer on the Internet
Official website of the Russian Scientific Society of Therapists	Modern materials and clinical recommendations for the diagnosis and treatment of diseases of internal organs [Electronic resource] – Access mode: www.rnmot.ru – Russian scientific society of therapists	from any computer on 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 study rooms
2. Lecture hall
3. Ultrasound room

9.2. List of equipment for classroom activities for the discipline

Multimedia projector
Notebook
Personal Computer
Ultrasound Scanner
Ultrasound simulator and dummies
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

ENDOCRINOLOGY AND INTERNAL MEDICINE

CHANGE REGISTRATION SHEET

working program for the academic discipline

BASICS OF ULTRASOUND DIAGNOSTICS IN THE CLINIC OF INTERNAL DISEASES

Field of study / specialty / scientific specialty: 31.05.01 MEDICAL BUSINESS
(code, name)

Training profile:

(name) - for master's degree programs

Mode of study: full-time

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 No. _____ of _____ 20__

Head of the Department

_____ / _____

department name, academic title

signature

print name