
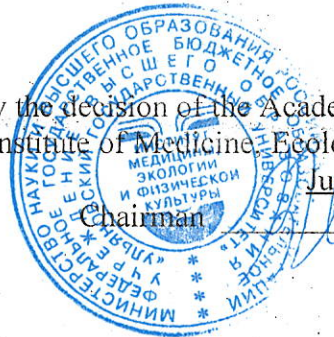


Ministry of Science and Higher Education of the Russian Federation Ulyanovsk State University	The form	
F-Work program of the discipline		

APPROVED
by the decision of the Academic Council of the USU
Institute of Medicine, Ecology and Physical Culture
June «22» 2020, № 10/220
Chairman V.I. Midlenko



« 22 » of June 2020

EDUCATIONAL PLAN

Subject	Radiation diagnostics
Faculty	Medical
Department	Oncology and radiation diagnostics
Course	6

Speciality 31.05.01. «General medicine»

(code of the speciality, full name)

Form of education- full-time education

Date of introducing in the instruction process at USU: « 01 » of September 2020.

The program was updated at the meeting of the department: № 1 of 31.08.2021

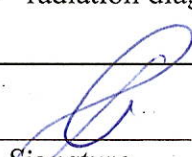

The program was updated at the meeting of the department: № 1 of 31.08.2022.


The program was updated at the meeting of the department: № 11 of 29.06.2023

The program was updated at the meeting of the department: № 10 of 27.06.2024

Information about the authors:

Initials	Department	Position, academic degree, scientific rank
Sharafutdinov M.G.	Oncology and radiation diagnostics	Head of the Department, Candidate of Medical Sciences, Associate Professor
Morozov V.S.	Oncology and radiation diagnostics	Candidate of Medical Sciences, Associate Professor
Sagel M.V.	Oncology and radiation diagnostics	Candidate of Medical Sciences, Associate Professor

AGREED	AGREED
Head of the department of Oncology and radiation diagnostics, implementing the discipline	Head of the graduating department of Hospital therapy
 / Sharafutdinov M.G. /	 / Vize-Khripunova M.A. /
Signature " 22 " 06 20 20	Signature " 22 " 06 20 20

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1. GOALS AND OBJECTIVES OF LEARNING THE DISCIPLINE:

Objectives of mastering the discipline:

- the acquisition by students of knowledge on radiation diagnostics of diseases of various organs, systems of the human body, the study of the features of diagnostics and training in the correct and adequate use of the knowledge gained in the therapeutic and diagnostic process.
- formation of students' holistic understanding of the formation of radiation symptoms and syndromes in pathological changes in organs from the point of view of objectivity and completeness of obtaining information obtained using various methods of radiation diagnostics, taking into account the full scope of their use.
- forming students' stable motivation for a deep study of radiation manifestations of various diseases, with the aim of further applying the knowledge gained in the subsequent study of other clinical disciplines (therapy, surgery, general medicine, oncology, orthopedics and traumatology, etc.), as well as in the real practice of a doctor ...

Objectives of mastering the discipline:

- study and assessment of the main regulatory parameters;
- methods of protection against ionizing radiation;
- the study of X-ray terminology, the peculiarities of the skialogical picture of X-rays, the construction of a symptom complex of diseases;
- study and assessment of information about new achievements and prospects for the use of various methods of radiation diagnostics;
- study of possible errors in the practice of a specialist in radiation diagnostics.

2. PLACE OF DISCIPLINE IN THE STRUCTURE OF OPOP:

Discipline "Radiation diagnostics" refers to the basic part of the disciplines of the curriculum of the direction of training "General Medicine".

The study of the nature and biological effect of radiation is carried out at the departments of medical and biological physics, medical biology, pathological anatomy, and pathological physiology. The basics of radiation diagnostics are presented at the department Oncology and radiation diagnostics in the 6th year. In the future, this information is deepened and consolidated during the passage of clinical disciplines (hospital therapy and surgery, obstetrics and gynecology, oncology, etc.), where the problems of private radiation diagnostics and endoscopy are considered in conjunction with specific issues of clinical diagnosis and treatment of patients. Thus, teaching students the basics of general and private radiation diagnostics and radiation therapy occurs throughout the entire 6 course.

Teaching "Radiation Diagnostics" is based on the knowledge gained in the course of studying the following disciplines:

Physics, mathematics **OK-1**

Philosophy **OK-1**

Propedeutics of internal diseases **PC-5, PC-6**

General surgery. Introduction to the specialty **PC-5, PC-6**

Pathological anatomy **PC-5**

Topographic anatomy and operative surgery **OK-1**


Dentistry **PC-5, PC-6**

Dermatovenereology **OPK-6, PK-5, PK-6**

Neurology, medical genetics. neurosurgery **PK-5, PK-6**

Otorhinolaryngology **PC-5**


Pediatrics **OPK-6, PK-5, PK-6**

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Faculty Surgery **PK-5**
 Faculty therapy **PK-5, PK-6**
 Ophthalmology **PC-6**
 Occupational diseases **OPK-6, PC-5, PC-6**
 Psychiatry, medical psychology **OPK-6, PK-5, PK-6**
 Endocrinology **PC-5, PC-6**
 Hospital therapy **OPK-6, PC-5, PC-6**
 Infectious diseases **PC-6**
 Traumatology, orthopedics **PK-5**
 Polyclinic therapy **OPK-6**
 Hospital surgery, pediatric surgery **OPK-6, PC-6**
 Anesthesiology, resuscitation and intensive care **PK-6**
 Phthisiology **PK-5, PK-6**
 Epidemiology of **OPK-6**
 Forensic medicine **PK-6**
 Oncology, radiation therapy **OPK-6, PK-5, PK-6**
 Radiation diagnostics **OK-1, OPK-6, PK-5, PK-6**
 Neuroanatomy **OK-1**
 Clinical psychology **OPK-6, PC-5, PC-6**
 Modern aspects of neurology **PK-5, PK-6**
 Topical issues of gynecology **PK-5, PK-6**
 Modern aspects of oncology **PC-5, PC-6**
 Psychology and pedagogy of medical practice **PK-5**
 Topical issues of internal diseases **PC-5, PC-6**
 Topical issues of hospital surgery **PC-5, PC-6**
 Urology and Andrology **PK-5, PK-6**
 Fundamentals of functional and laboratory diagnostics **-PK-5**
 Immunology **PC-5, PC-6**
 Diagnostics and treatment of extrapulmonary tuberculosis **PC-5, PC-6**
 Surgical gastroenterology and endoscopy **PC-5, PC-6**
 Palliative medicine **PK-5, PK-6**
 Clinical pathological anatomy **PK-6**
 Diabetology and emergency endocrinology **PK-5, PK-6**
 Topical issues of HIV infection **OPK-6, PC-5, PC-6**
 Clinical electrocardiography **PC-5, PC-6**
 Assistant to the ward nurse **OPK-6**
 Procedural Nurse Assistant **OPK-6**
 Clinical practice (hospital doctor's assistant) **OPK-6, PK-5, PK-6**
 Physician assistant of the outpatient clinic **OPK-6, PK-5, PK-6**
 Preparation and passing of the state exam **OK-1, OPK-6, PC-6**

**3. LIST OF PLANNED LEARNING OUTCOMES ON THE DISCIPLINE
 (MODULE), CORRELATED TO THE PLANNED OUTCOMES OF THE BASIC
 PROFESSIONAL EDUCATIONAL PROGRAM**

Code and name of the implemented competence	The list of planned learning outcomes for the discipline (module), correlated with indicators of achievement of competencies
OK-1 (ability for abstract thinking,	Know: the principles of analysis, synthesis, abstract thinking. Be able to: analyze, synthesize and abstractly reflect in various

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analysis, synthesis)	situations. Own: techniques of analysis, synthesis, abstract thinking
OPK-6 (ability to maintain medical records)	Know: regulatory documentation adopted in the healthcare of the Russian Federation (laws of the Russian Federation, technical regulations, international and national standards, orders, recommendations, terminology, current international classifications), as well as documentation for assessing the quality and efficiency of medical organizations. Be able to: maintain medical records of various kinds in medical organizations; Owning: methods of conducting medical accounting reporting documentation in medical institutions;
PC-5 (readiness to collect and analyze patient complaints, data from his anamnesis, examination results, laboratory, instrumental, pathological and other studies in order to recognize the condition or establish the presence or absence of a disease)	Know: normal radiation anatomy of organs and systems; main methods of radiation therapy, indications and contraindications for their implementation, international classifications of oncological diseases (TNM). Be able to: determine the radiation symptoms of the most common diseases; radiation symptoms of urgent conditions of patients, to assess oncological diseases according to international classifications. Owning: p azlichnymi methods of diagnosis and analysis, the use of diagnostic and rating scales used in radiodiagnostics.
PC -6 (the ability to determine the patient's main pathological conditions, symptoms, syndromes of diseases, nosological forms in accordance with the International Statistical Classification of Diseases and Related Health Problems, X revision)	Know: diagnostic capabilities of various methods of radiation diagnostics; have an idea of the styling for the production of images of various organs and systems; have an idea of the technical features of various X-ray equipment. Be able to: read images of various diagnostic methods; find changes in the presented radiographs, tomograms, sonograms. Possess: the skills of drawing up a description protocol with a mandatory conclusion about the alleged pathological process.

4. TOTAL EMPLOYMENT OF THE DISCIPLINE

4.1. Discipline volume in credit units (total) 2 ZET

4.2. Discipline volume by type of academic work (in hours) 72 hours

Type of educational work	Number of hours (full-time education)	
	Total according to plan	Incl. by semester eleven
1	2	3
Contact work of students with the teacher in accordance with the UP	48	48
Auditory lessons:	36	36
lectures	12	12
Seminars and workshops	36	36
laboratory works, workshops	-	-
Independent work	24	24
Form of current control of knowledge and control	Oral survey	Oral survey

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independent work: testing, counter. work, colloquium, etc. (at least 2 types)		
Course work	-	-
Types of intermediate certification (exam, test)	Offset	Offset
Total hours by discipline	72	72

*The number of hours of teaching staff working with students in a distance format using e-learning

4.3. Content of the discipline (module.) Distribution of hours by topics and types of academic work:

Full-time form of education

Title and sections and topics	Total	Types of training sessions					Knowledge current control form
		Auditory lessons			Interactive classes	Independent work	
		lectures	practical training, seminar	laboratory work			
1	2	3	4	five	6	7	8
Section 1. Radiology							
1. Introduction to Radiology.	8	2	4	-	1		Oral survey
2. X-ray diagnostics of diseases of the osteoarticular apparatus.	4		4	-	1		Oral survey
3. X-ray diagnostics of diseases of the respiratory system, heart and mediastinum	ten		4	-		8	Oral survey
4. X-ray diagnostics of breast diseases. Benign tumors. Mastopathy. Mammary cancer.	ten		2	-		8	Oral survey
5. Radiation diagnosis of diseases, esophagus, stomach, intestines.	2		2	-			Oral survey
Section 2. Radionuclide diagnostics							
6. Radionuclide diagnostics.	2	2	2	-	1		Oral survey
Section 3. Ultrasound diagnostics							
7. Fundamentals of ultrasound diagnostics. Radiation methods for examining the liver, gastrointestinal tract, pancreas.	4	2	2	-			Oral survey
8. Radiation methods of research of kidneys, bladder, prostate gland.	2		2	-			Oral survey
Section 4. CT diagnostics							
9. Basics of CT diagnostics. CT diagnostics of diseases of the brain and chest organs.	4	2	2	-	1		Oral survey, testing
10. CT diagnostics of diseases of the abdominal cavity, retroperitoneal space, small pelvis, musculoskeletal system.	2		2	-			Oral survey, testing
Section 5. MRI diagnostics							
11. Basics of MRI diagnostics. Diagnosis of diseases of the brain.	4	1	2	-			Oral survey, testing
12. Basics of MRI diagnostics. Radiation diagnosis of diseases of the breast, spine and spinal cord.	4	1	2	-			Oral survey, testing

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Section 6. Radiation therapy							
13. Radiation therapy. Types of ionizing radiation and their sources. Radiation therapy methods. Radiosensitivity and radio modification.	4	2	2	-			Oral survey
14. Radiation therapy. Pre-ray period. Ray period. Post-radiation period. Complications of radiation therapy and control of them.	ten		2	-		8	Oral survey
Total	70	12	34	-	4	24	

5. CONTENT OF THE DISCIPLINE (MODULE)

Section 1. Radiology.

Topic 1. Questions of general radiology. Features of the X-ray examination technique. X-ray diagnostics of diseases of the osteoarticular apparatus.

Content of the topic: What are X-rays, their properties. The history of the discovery, its essence, practical application. Classification of the main types of ionizing radiation. Conditions for the use of radiological research methods. Requirements for personnel, premises, work organization. The concept of "medical diagnostic image". Imaging system in radiation diagnostics. Image analysis system in radiation diagnostics. Computer processing of information in radiation diagnostics. The role and place of computer technology in modern medicine. Analog and matrix image. The principle of the X-ray examination method. What is the natural contrast of an organ and how an X-ray image is formed. Artificial contrasting of organs, its goals, objectives, ways of conducting, indications, contraindications, complications. What is fluoroscopy and how is it performed, the frequency of application of the method. What is radiography, how is it carried out. Digital X-ray, principles, benefits. Special methods of X-ray examination, their purpose. Radiation anatomy of bones and joints, structural features. Radiation methods for studying bones and joints. X-ray anatomy of bone fractures. X-ray semiotics of focal and diffuse skeletal lesions

Topic 2. X-ray diagnostics of diseases of the osteoarticular apparatus.

Radiation anatomy of bones and joints, structural features. Radiation methods for studying bones and joints. X-ray anatomy of bone fractures. X-ray semiotics of focal and diffuse skeletal lesions

Topic 3. X-ray diagnostics of diseases of the respiratory system, heart, mediastinum.

Content of the topic: The concept of a shadow on an X-ray, their classification, the analysis system. Principles of formation of pathological changes in X-ray examination. X-ray anatomy of the lungs. Methods of X-ray examination of the lungs, the principle of image formation, indications for conducting. The main radiological syndromes of lung damage and the mechanism of their formation. Inflammatory diseases of the lungs in the x-ray image.

Radiation methods of heart research. The main radiation signs of heart damage. Radiation methods of research of vessels. Radiation signs of the main vascular pathology. Interventional radiology concept.


Topic 4. X-ray diagnostics of diseases of the esophagus, stomach, intestines.

Content of the topic: Radiation methods for studying the esophagus Radiation anatomy and pathology of the esophagus. Radiation methods for studying the stomach and duodenum. Radiation anatomy and pathology of the stomach and duodenum. Radiation semiotics of diseases of the stomach and duodenum. Radiation methods for studying the intestines. Radiation semiotics of intestinal obstruction. Radiation semiotics of intestinal diseases

Topic 5. X-ray diagnostics of breast diseases. Benign tumors. Mastopathy. Mammary cancer.

Topic content: Normal and variable radial anatomy of the mammary glands.

Research methods of the mammary glands. X-ray semiotics of breast diseases.

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Features of radiation diagnosis of mammary glands with an implant. Radiation diagnosis of inflammatory diseases of the mammary glands: abscess, mastitis, lactostasis. Radiation diagnosis of inflammatory diseases of the mammary glands: specific inflammation, tuberculosis, syphilis, actinomycosis. Radiation diagnosis of breast injuries: hematoma, foreign bodies. Radiation diagnosis of benign breast diseases. Radiation semiotics. Radiation diagnostics of malignant diseases of the breast. Classification and staging. Radiation diagnostics of malignant diseases of the breast. Pathology of the zones of regional lymph outflow.
Radiation diagnosis of breast diseases in men.

Section 2. Radionuclide diagnostics.

Topic 6. Radionuclide diagnostics.

Topic content: Radionuclide, its characteristics. Scheme of radionuclide research. Indications for a radionuclide study. Radioprotective measures. Radionuclide imaging methods: scanning, scintigraphy, SPECT, advantages and disadvantages. Positron emission tomography method, field of application, difference from other methods of radionuclide diagnostics.

Section 3. Ultrasound diagnostics.

Topic 7. Physical and technical foundations of the ultrasonic research method.

Content of the topic: Physical properties of ultrasound. Ultrasonic device design. Principles of ultrasound research, features of the method. Ultrasound research methods: A, B, M, dopplerography.

Topic 8. Ultrasound diagnostics of superficially located structures.

Ultrasound diagnostics of thyroid diseases (cysts, goiter, benign and malignant tumors). Ultrasound diagnostics of breast diseases (fibrocystic disease, benign tumors). Ultrasound diagnostics of peripheral lymph node diseases (lymphadenitis, malignant lymphomas).

Topic 9. Ultrasound diagnostics of diseases of the cardiovascular system.

Content of the topic: Types of ultrasound examination of the heart. Ultrasound imaging of heart structures (atria, ventricles, valves). Congenital heart defects. Ultrasound diagnosis of vascular diseases of the head and neck. Ultrasound diagnosis of vascular diseases of the upper and lower extremities. Ultrasound diagnostics of diseases of the abdominal aorta and its visceral branches.

Topic 10. Ultrasound diagnostics of diseases of the abdominal organs.

Content of the topic: Radiation diagnostics of diffuse liver lesions (hepatitis, fatty hepatitis, cirrhosis). Radiation diagnosis of focal liver lesions (cysts, abscesses, tumors). Ultrasound diagnostics of gallbladder diseases (malformations, calculous and acalculous cholecystitis, tumors). Differential diagnosis of jaundice in the study of the hepatobiliary system. Ultrasound diagnostics of pancreatic diseases (pancreatitis, cysts, tumors). Ultrasound diagnostics of spleen diseases (splenomegaly, trauma, tumor).

Topic 11. Ultrasound diagnostics of kidney and urinary tract diseases.

Content of the topic: Ultrasound diagnosis of kidney diseases (malformations, urolithiasis, inflammatory diseases, cysts, tumors). Ultrasound diagnosis of bladder diseases (urolithiasis, malformations). Ultrasound examination of the adrenal glands.

Section 4. X-ray CT diagnostics.

Topic 12. Physical and technical foundations of X-ray computed tomography.


Topic content: Principle of scanning. Image reconstruction. Display and documentation of images. Scan options. Types of tomographs. Detector types. Basic rules for reading computer tomograms. Preparing the patient for the study.

Topic 13. X-ray CT of the brain.

Content of the topic: X-ray CT diagnosis of hydrocephalus.

Neuroimaging of the bypass system and complications of bypass surgery.

Topic 14. X-ray CT of the brain

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Topic content: CT-diagnostics of hemorrhage, trauma, tumors and non-tumor masses, inflammatory diseases (CMV, herpes, congenital toxoplasmosis, meningitis, encephalitis), vascular malformations.

Topic 15. X-ray CT of the brain.

Content of the topic: X-ray CT diagnosis of congenital malformations of the central nervous system: Arnold-Chiari anomaly; Dandy Walker's anomaly; holoporencephaly; hydranencephaly; congenital malformation of the vein of Galen; congenital cysts.

Topic 16. X-ray CT diagnostics of diseases of the organs of the mammary gland.

Content of the topic: Congenital malformations of the lungs and bronchi. Lung cysts. Tumors and cysts of the mediastinum. Infectious diseases (pneumonia, lung abscess, pleurisy, tuberculosis), pleural effusion.

Topic 17. X-ray CT diagnostics of diseases of the abdominal cavity, retroperitoneal space.

Topic content: CT signs of diffuse and focal liver pathology (hepatitis, cirrhosis, cysts, benign and malignant tumors), biliary tract (malformations, choledocholithiasis), pancreas (pancreatitis, cysts, tumors), spleen, adrenal glands, kidneys (pyelonephritis, urolithiasis, tuberculosis, tumors), hollow organs of the gastrointestinal tract. CT signs of specific and nonspecific lymphadenopathy. CT diagnostics of benign and malignant tumors of the retroperitoneal space.

Section 5. MRI diagnostics.

Topic 18. Physical and technical foundations of magnetic resonance imaging.

Content of the topic: Physical and biological foundations of the method of magnetic resonance imaging. Main indications and contraindications for MRI examination, requirements. Preparing the patient for the study.

Topic 19. MRI diagnostics of congenital anomalies and malformations of the brain.

Topic content: Arachnoid cysts, Arnold-Chiari anomaly, Dandy-Walker anomaly, agenesis of the corpus callosum, heterotopia, anomaly of furrow development, phakomatosis-tuberous sclerosis, Hippel-Lindau disease.

Topic 20. MRI diagnostics of congenital pathology of the spinal cord and spine.

Content of the topic: "Spinal dysraphism" syndrome. MR-semiotics of myelocoele, myelomeningocele, MR-semiotics of diastematomyelia, syringomyelia.

Topic 21. MRI diagnostics of brain tumors.

Content of the topic: Tumors of the supratentorial region: intracerebral tumors, tumors of the suprasellar region, pineal region, base of the skull. Tumors of the posterior cranial fossa (tumors of the trunk, tumors of the worm and cerebellar hemispheres). Advantages and disadvantages of MRI in the diagnosis of brain tumors.

Topic 22. MRI diagnostics of hydrocephalus and its causes of development.

Topic content: Epilepsy and the importance of MRI in visualizing structural changes in the brain substance.

Topic 23. MRI diagnostics of spinal cord diseases.


Content of the topic: MRI semiotics of spinal cord tumors. MRI diagnostics of intramedullary and extramedullary cysts. MRI signs of spinal cord demyelination.

Topic 24. MRI diagnostics of heart diseases.

Content of the topic: Diagnostic capabilities of MRI in the diagnosis of heart disease. Indications for MRI of the heart. MRI diagnostics of coronary heart disease. Possibilities of MRI in the diagnosis of cardiomyopathies, myocarditis, pericardial disease. MR-semiotics of acquired heart defects. MR-semiotics of congenital heart defects. MR-semiotics of cardiac tumors.

Topic 25. MRI diagnostics of kidney and pelvic diseases.

Topic content: Indications for MRI of the kidneys. MRI diagnostics of renal cystic formations. MRI diagnostics of benign and malignant kidney tumors (Wilms tumor). MRI diagnostics of diseases of the small pelvis.

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6. TOPICS OF PRACTICAL AND SEMINAR LESSONS

Section 1. Radiology.

Topic 1. Questions of general radiology. Features of the X-ray examination technique. X-ray diagnostics of diseases of the osteoarticular apparatus.

Questions on the topics of the section :

1. What are X-rays, their properties. The history of the discovery, its essence, practical application.
2. Classification of the main types of ionizing radiation.
3. Conditions for the use of radiological research methods.
4. Requirements for personnel, premises, work organization.
5. The concept of "medical diagnostic image".
6. Imaging system in radiation diagnostics.
7. Image analysis system in radiation diagnostics.
8. Computer processing of information in radiation diagnostics. The role and place of computer technology in modern medicine.
9. Analog and matrix image.
10. The principle of the X-ray examination method.
11. What is the natural contrast of an organ and how an X-ray image is formed. Artificial contrasting of organs, its goals, objectives, ways of conducting, indications, contraindications, complications.
12. What is fluoroscopy and how is it performed, the frequency of application of the method.
13. What is radiography, how is it carried out.
14. Digital X-ray, principles, benefits.
15. Special methods of X-ray examination, their purpose.

Topic 2. X-ray diagnostics of diseases of the osteoarticular apparatus.


Questions on the topics of the section :

1. X-ray anatomy of bones and joints.
2. Age features of bones and joints.
3. Bones and joints in the X-ray image.
4. X-ray picture of the main pathological processes of bones and joints.
5. X-ray semiotics of injuries of the musculoskeletal system: dislocations, fractures and their healing.
6. X-ray picture of diseases of bones and joints: systemic and widespread (avitaminosis, dystrophy, blood diseases, etc.), focal (osteomyelitis, tuberculosis, degenerative-dystrophic lesions, tumors).

Topic 3. X-ray diagnostics of diseases of the respiratory system, heart, mediastinum.

Questions on the topics of the section :

1. The concept of a shadow on a radiograph, their classification, analysis system.
2. Principles of formation of pathological changes in X-ray examination.
3. X-ray anatomy of the lungs.
4. Methods of X-ray examination of the lungs, the principle of image formation, indications for conducting.
5. The main radiological syndromes of lung damage and the mechanism of their formation.
6. Inflammatory diseases of the lungs in the x-ray image.
7. Radiation methods of heart research. The main radiation signs of heart damage.
8. Radiation methods of research of vessels. Radiation signs of the main vascular pathology.
9. Interventional radiology concept.

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Topic 4 . X-ray diagnostics of diseases of the esophagus, stomach, intestines.

Questions on the topics of the section :

1. Radiation methods for studying the esophagus.
2. Radiation anatomy and pathology of the esophagus.
3. Radiation methods for studying the stomach and duodenum.
4. Radiation anatomy and pathology of the stomach and duodenum.
5. Radiation semiotics of diseases of the stomach and duodenum.
6. Radiation methods for studying the intestines.
7. Radiation semiotics of intestinal obstruction.
8. Radiation semiotics of intestinal diseases

Topic 5 . X-ray diagnostics of breast diseases. Benign tumors. Mastopathy. Mammary cancer.

Questions on the topics of the section :

1. Normal and variable radial anatomy of the mammary glands.
2. Research methods of the mammary glands.
3. X-ray semiotics of breast diseases.
4. Features of radiation diagnosis of mammary glands with an implant.
5. Radiation diagnosis of inflammatory diseases of the mammary glands: abscess, mastitis, lactostasis.
6. Radiation diagnosis of inflammatory diseases of the mammary glands: specific inflammation, tuberculosis, syphilis, actinomycosis.
7. Radiation diagnosis of breast injuries: hematoma, foreign bodies.
8. Radiation diagnosis of benign breast diseases. Radiation semiotics.
9. Radiation diagnostics of malignant diseases of the breast. Classification and staging.
10. Radiation diagnostics of malignant diseases of the breast. Pathology of the zones of regional lymph outflow.
11. Radiation diagnosis of breast diseases in men.

Section 2. Radionuclide diagnostics.

Topic 6. Radionuclide diagnostics.

Questions on the topics of the section :

1. Radionuclide, its characteristics.
2. Scheme of radionuclide research.
3. Indications for a radionuclide study.
4. Radioprotective measures.
5. Radionuclide imaging methods: scanning, scintigraphy, SPECT, advantages and disadvantages.
6. Positron emission tomography method, field of application, difference from other methods of radionuclide diagnostics.

Section 3. Ultrasound diagnostics.

Topic 7: Physical and technical foundations of the ultrasonic research method.


Questions on the topics of the section :

1. Physical properties of ultrasound.
2. Ultrasonic device design.
3. Principles of ultrasound examination.
4. Ultrasound research methods: A, B, M, dopplerography.

Topic 8. Ultrasound diagnostics of superficially located structures.

Questions on the topics of the section :

1. Ultrasound diagnostics of thyroid diseases (cysts, goiter, benign and malignant tumors).
2. Ultrasound diagnostics of breast diseases (fibrocystic disease, benign tumors).

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3. Ultrasound diagnostics of peripheral lymph node diseases (lymphadenitis, malignant lymphomas).

Topic 9. Ultrasound diagnostics of diseases of the cardiovascular system.

Questions on the topics of the section :

1. Types of ultrasound examination of the heart.
2. Ultrasound imaging of heart structures (atria, ventricles, valves).
3. Congenital heart defects.
4. Ultrasound diagnosis of vascular diseases of the head and neck.
5. Ultrasound diagnosis of vascular diseases of the upper and lower extremities. Ultrasound diagnostics of diseases of the abdominal aorta and its visceral branches.

Topic 10. Ultrasound diagnostics of diseases of the abdominal organs.

Questions on the topics of the section :

1. Radiological diagnosis of diffuse liver lesions (hepatitis, fatty hepatosis, cirrhosis).
2. Radiation diagnosis of focal liver lesions (cysts, abscesses, tumors).
3. Ultrasound diagnostics of gallbladder diseases (malformations, calculous and acalculous cholecystitis, tumors).
4. Differential diagnosis of jaundice in the study of the hepatobiliary system.
5. Ultrasound diagnostics of pancreatic diseases (pancreatitis, cysts, tumors).
6. Ultrasound diagnostics of spleen diseases (splenomegaly, trauma, tumor).

Topic 11. Ultrasound diagnostics of kidney and urinary tract diseases.

Questions on the topics of the section :

1. Ultrasound diagnostics of kidney diseases (malformations, urolithiasis, inflammatory diseases, cysts, tumors).
2. Ultrasound diagnosis of bladder diseases (urolithiasis, malformations).
3. Ultrasound examination of the adrenal glands.

Section 4. X-ray CT diagnostics.

Topic 12. Physical and technical foundations of X-ray computed tomography.

Questions on the topics of the section :

1. Scanning principle.
2. Image reconstruction.
3. Display and documentation of images.
4. Scan options.
5. Types of tomographs.
6. Detector types.
7. Basic rules for reading computer tomograms.
8. Preparing the patient for the study.


Topic 13. X-ray CT of the brain.

Questions on the topics of the section :

1. RCT diagnosis of hydrocephalus.
2. Neuroimaging of the bypass system and complications of bypass surgery.
3. X-ray CT diagnostics of hemorrhage, trauma, tumors and non-tumor masses, inflammatory diseases (CMV, herpes, congenital toxoplasmosis, meningitis, encephalitis), vascular malformations.
4. X-ray CT diagnosis of congenital malformations of the central nervous system: Arnold-Chiari malformation; Dandy Walker's anomaly; holopencephaly; hydranencephaly; congenital malformation of the vein of Galen; congenital cysts.

Topic 14. X-ray CT-diagnostics of diseases of the organs of the breast.

Questions on the topics of the section :

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1. Congenital malformations of the lungs and bronchi.
2. Lung cysts.
3. Tumors and cysts of the mediastinum.
4. Infectious diseases (pneumonia, lung abscess, pleurisy, tuberculosis), pleural effusion.

Topic15. X-ray CT diagnostics of diseases of the abdominal cavity, retroperitoneal space.

Questions on the topics of the section :

1. CT signs of diffuse and focal liver pathology (hepatitis, cirrhosis, cysts, benign and malignant tumors),
2. CT signs of biliary tract pathology (malformations, choledocholithiasis),
3. CT signs of pancreatic pathology (pancreatitis, cysts, tumors), spleen,
4. CT signs of adrenal and kidney pathology (pyelonephritis, urolithiasis, tuberculosis, tumors),
5. CT signs of pathology of the hollow organs of the gastrointestinal tract.
6. CT signs of specific and nonspecific lymphadenopathy.
7. CT diagnostics of benign and malignant tumors of the retroperitoneal space.

Section 5. MRI diagnostics.

Topic 16. Physical and technical foundations of magnetic resonance imaging.

Questions on the topics of the section :

1. Physical and biological foundations of the method of magnetic resonance imaging.
2. Main indications and contraindications for MRI examination, requirements.
3. Preparing the patient for the study.

Topic 17. MRI diagnostics of congenital anomalies and malformations of the brain.

Questions on the topics of the section :

1. Arachnoid cysts.
2. Arnold-Chiari anomaly.
3. Dandy Walker Anomaly.
4. Agenesis of the corpus callosum.
5. Heterotopia, anomaly in the development of furrows.
6. Phakomatoses - tuberous sclerosis.
7. Hippel-Lindau disease.

Topic 18. MRI diagnostics of congenital pathology of the spinal cord and spine.

Questions on the topics of the section :

1. Spinal dysraphism syndrome.
2. MR-semiotics of myelocele, myelomeningocele
3. MR-semiotics of diastematomyelia, syringomyelia.

Topic 19. MRI diagnostics of brain tumors.

Questions on the topics of the section :

1. Tumors of the supratentorial region: intracerebral tumors, tumors of the suprasellar region, pineal region, skull base.
2. Tumors of the posterior cranial fossa (tumors of the trunk, tumors of the worm and cerebellar hemispheres).
3. Advantages and disadvantages of MRI in the diagnosis of brain tumors.

Topic 20. MRI diagnostics of hydrocephalus and its causes of development.

Questions on the topics of the section :


Epilepsy and the importance of MRI in visualization of structural changes in brain matter.

Topic 21. MRI diagnostics of spinal cord diseases.

Questions on the topics of the section :

MRI semiotics of spinal cord tumors. MRI diagnostics of intramedullary and extramedullary cysts. MRI signs of spinal cord demyelination.

Topic 22. MRI diagnostics of heart diseases.

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Questions on the topics of the section :

1. Diagnostic capabilities of MRI in the diagnosis of heart disease.
2. Indications for MRI of the heart.
3. MRI diagnostics of coronary heart disease.
4. Possibilities of MRI in the diagnosis of cardiomyopathies, myocarditis, pericardial disease.
5. MR-semiotics of acquired heart defects.
6. MR-semiotics of congenital heart defects. MR-semiotics of cardiac tumors.

Topic 23. MRI diagnostics of diseases of the kidneys, pelvic organs.

Questions on the topics of the section :

1. Indications for MRI of the kidneys.
2. MRI diagnostics of renal cystic formations.
3. MRI diagnostics of benign and malignant kidney tumors (Wilms tumor).
4. MRI diagnostics of diseases of the small pelvis.

7. **LABORATORY WORKS, PRACTICE**


This type of work is not provided for by the EP

8. **ABSTRACT TOPICS**


9. This type of work is not provided for by the EP

9. LIST OF QUESTIONS TO CREDIT

1. What are X-rays and their properties? The history of the discovery, its essence, practical application.
2. Classification of the main types of ionizing radiation.
3. Conditions for the use of radiological research methods. Requirements for personnel, premises, work organization.
4. The concept of "medical diagnostic image". Imaging system in radiation diagnostics.
5. The role and place of computer technology in modern medicine. Analog and matrix image.
6. The principle of the X-ray examination method.
7. What is the natural contrast of an organ and how is an X-ray image formed?
8. Artificial contrasting of organs, its goals, objectives, ways of conducting, indications, contraindications, complications.
9. What is fluoroscopy and how is it done? The frequency of application of the method in pediatrics.
10. Digital X-ray, principles, benefits.
11. Radiation methods for studying bones and joints.
12. X-ray anatomy of bone fractures.
13. X-ray semiotics of focal and diffuse skeletal lesions.
14. Methods of X-ray examination of the lungs, the principle of image formation, indications for conducting.
15. Inflammatory diseases of the lungs in the x-ray image.
16. X-ray diagnosis of pulmonary tuberculosis.
17. X-ray picture of lung cancer (central, peripheral cancer).
18. Diagnosis of thromboembolism of the branches of the pulmonary artery.
19. The main radiation signs of heart damage.
20. Radiation methods of research of vessels.
21. The concept of interventional radiology, examples of application in pediatric practice.

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22. Radiation methods for studying the esophagus.
23. Radiation methods for studying the stomach and duodenum.
24. Radiation semiotics of diseases of the stomach and duodenum.
25. Radiation semiotics of intestinal diseases.
26. The concept of natural and artificial radioactivity, the essence of the phenomenon, the history of the discovery.
27. The concept of radionuclide diagnostics. The frequency of application of the method in the diagnosis of diseases. Radionuclide, its characteristics.
28. Radiopharmaceutical, requirements for it.
29. Scheme of radionuclide research.
30. Image visualization systems in radionuclide diagnostics.
31. Methods of radiometry, radiography, their essence, disadvantages.
32. Radionuclide imaging methods: scanning, scintigraphy, SPECT, advantages and disadvantages.
33. Positron emission tomography method, field of application, difference from other methods of radionuclide diagnostics.
34. Thermography method, essence, main indications for use.
35. Basic principles of radiation diagnostics.
36. Differential diagnosis of jaundice in the study of the hepatobiliary system.
37. Radiation anatomy of the liver and gastrointestinal tract using various methods of radiation diagnostics.
38. Ultrasonic waves, concept. Ultrasound examination scheme.
39. Ultrasound research methods: A, B, M, dopplerography. The frequency of their use in pediatrics.
40. Radiation physiology of the hepatobiliary system. Cholelithiasis.
41. Diagnostic algorithms in the study of the hepatobiliary system.
42. Radiation diagnosis of focal liver lesions (cysts, abscesses, tumors).
43. Radiological diagnosis of diffuse liver lesions (hepatitis, fatty hepatosis, cirrhosis).
44. Radiation anatomy and physiology of the pancreas, radiation pathology (diffuse and focal).
45. Radiation anatomy of the kidneys and urinary tract, their radiation physiology. Features.
46. Urolithiasis, its radiation anatomy and physiology. Radiation diagnosis of renal malformations. Radiation diagnosis of inflammatory kidney disease.
47. Hematuria. The logic of radiation examination.
48. Radiation picture of hydronephrotic transformation. Radiation anatomy of focal kidney pathology (cysts, tumors).
49. Radiation anatomy and semiotics of urinary bladder diseases.
50. Frequency of CT application in pediatrics, main indications.
51. X-ray diagnosis of pulmonary tuberculosis.
52. Analysis of CT images of the brain and skull of newborns and young children: features of the X-ray anatomy of the brain and skull. Congenital malformations of the brain. Brain tumors.
53. Analysis of CT images of the brain and skull of newborns and young children: intracranial hemorrhages, pathology with infections of the central nervous system (CMV, herpes, congenital toxoplasmosis, meningitis, encephalitis), hydrocephalus (open, occlusive).
54. The use of contrast agents: indications, contraindications, features of use.
55. CT scan of the chest: indications for examination. Analysis of CT images: radiation anatomy of the chest organs of newborns and young children; congenital developmental anomalies.


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56. CT signs of pathological changes: diffuse and focal changes in the chest organs.
57. CT signs of pathological changes: diffuse and focal changes in the chest organs.
58. Features of the anatomy of the abdominal cavity and retroperitoneal space in the CT image. CT diagnosis of congenital structural anomalies, inflammatory diseases, tumors (neuroblastoma, Wilms tumor).
59. Radiation anatomy of the pelvic organs. CT diagnostics of inflammatory, benign and malignant diseases of the pelvic organs in men and women.
60. Tumor diseases of the musculoskeletal system: CT diagnosis of primary and secondary tumor changes.
61. Physical and biological foundations of the method of magnetic resonance imaging.
62. MRI of the brain: radiation anatomy of the brain in magnetic resonance imaging, diagnostics of vascular diseases (aneurysms, ischemic disorders of cerebral circulation, intracerebral hemorrhage).
63. MRI diagnostics of brain tumors, criteria for benign and malignant tumors. Epilepsy.
64. MRI diagnostics of diseases of the spine and spinal cord: developmental anomalies, trauma, syringomyelia.
65. MRI diagnostics of diseases of the spine and spinal cord: primary and metastatic tumors of the spine, spinal cord.
66. Main indications and contraindications for MRI examination, requirements.
67. MRI diagnostics of demyelinating diseases of the nervous system, diagnostic criteria for multiple sclerosis.
68. Methods of radiological diagnostics of breast pathology. MRI diagnostics of juvenile fibroadenoma, galactocele.
69. CT diagnosis of traumatic, inflammatory, degenerative-dystrophic lesions of the bone system, congenital developmental anomalies.
70. MRI diagnostics of pathological changes in the lymph nodes.


10. INDEPENDENT WORK OF STUDENTS

Full-time study form

Title of sections and topics	Type of independent work (<i>study of educational material, problem solving, test work, preparation for passing the test, exam, etc.</i>)	Volume in hours	form of control (<i>checking the solution of problems, abstract, etc.</i>)
General radiology issues. Features of the X-ray examination technique. X-ray diagnostics of diseases of the osteoarticular apparatus.	study of educational material, preparation for passing the test	4	oral questioning
X-ray diagnostics of diseases of the respiratory system, heart, mediastinum. X-ray diagnostics of diseases of the esophagus, stomach, intestines.	study of educational material, preparation for passing the test	4	oral questioning
Radionuclide diagnostics in the diagnosis of diseases. Radionuclide, its characteristics. Radiometry, radiography methods	study of educational material, preparation for passing the test	4	oral questioning
Physical and technical foundations of magnetic resonance imaging. MRI diagnostics of diseases of the brain, spinal cord, spine. MRI diagnostics of heart	study of educational material, preparation for passing the test	4	oral questioning

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diseases. MRI diagnostics of kidney and pelvic diseases.			
Physical and technical foundations of X-ray computed tomography. CT diagnostics of diseases of the chest organs. CT diagnostics of diseases of the abdominal cavity, retroperitoneal space.	study of educational material, preparation for passing the test	4	oral questioning
Physical and technical foundations of the ultrasonic research method. Ultrasound diagnostics of diseases of the abdominal organs. Ultrasound diagnostics of kidney and urinary tract diseases.	study of educational material, preparation for passing the test	4	oral questioning

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11. УЧЕБНО-МЕТОДИЧЕСКОЕ И ИНФОРМАЦИОННОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ

а) Список рекомендуемой литературы

основная


1. Терновая С.К., Лучевая диагностика и терапия. Частная лучевая диагностика / Терновой С. К. и др. - М. : ГЭОТАР-Медиа, 2014. - 356 с. - ISBN 978-5-9704-2990-7 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <http://www.studentlibrary.ru/book/ISBN9785970429907.html>
2. Илясова Е.Б., Лучевая диагностика : учебное пособие / Илясова Е. Б., Чехонацкая М. Л., Приезжева В. Н. - М. : ГЭОТАР-Медиа, 2016. - 280 с. - ISBN 978-5-9704-3789-6 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <http://www.studentlibrary.ru/book/ISBN9785970437896.html>
3. Труфанов Г.Е., Лучевая диагностика : учебник / Труфанов Г.Е. и др. - М. : ГЭОТАР-Медиа, 2018. - 484 с. - ISBN 978-5-9704-4419-1 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <http://www.studentlibrary.ru/book/ISBN9785970444191.html>

дополнительная:

1. Васильев А.Ю., Лучевая диагностика / Васильев А.Ю., Ольхова Е.Б. - М. : ГЭОТАР-Медиа, 2008. - 688 с. - ISBN 978-5-9704-0612-0 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <http://www.studentlibrary.ru/book/ISBN9785970406120.html>
2. Шехтман, А. Г. Современные методы лучевой диагностики патологии черепа и позвоночника, головного и спинного мозга : учебное пособие / А. Г. Шехтман, Д. Ю. Коновалов, О. Я. Малыгина. — Оренбург : Оренбургская государственная медицинская академия, 2014. — 55 с. — ISBN 2227-8397. — Текст : электронный // Электронно-библиотечная система IPR BOOKS : [сайт]. — URL: <http://www.iprbookshop.ru/51488.html>
3. Филимонов В.И., Атлас лучевой анатомии человека / Филимонов В.И., Шилкин В.В., Степанков А.А., Чураков О.Ю. - М. : ГЭОТАР-Медиа, 2010. - 452 с. - ISBN 978-5-9704-1361-6 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <http://www.studentlibrary.ru/book/ISBN9785970413616.html>
4. Методы лучевой диагностики. Рентгенология [Электронный ресурс] : учебно-методическое пособие для врачей и студентов / М. Г. Шарафутдинов [и др.]; УлГУ, ИМЭиФК, Каф. онкологии и лучевой диагностики. - Электрон. текстовые дан. (1 файл : 845 КБ). - Ульяновск : УлГУ, 2018. - URL : <http://lib.ulsu.ru/MegaPro/Download/MObject/1244/Sharafutdinov2018-2.pdf>

учебно-методическая:

1. Ультразвуковое исследование органов брюшной полости и поверхностных структур [Электронный ресурс] : электрон. учеб. курс для студентов мед. вузов / М. В. Сагель [и др.]. - Электрон. текстовые дан. - Ульяновск : УлГУ, 2017. - URL: <http://edu.ulsu.ru/cources/861/interface/>
2. Методические указания для самостоятельной работы студентов по дисциплине «Лучевая диагностика» для специальности 31.05.01 «Лечебное дело» / М. Г. Шарафутдинов, В. С. Морозов, М. В. Сагель; УлГУ, Мед. фак., Каф. онкологии и лучевой диагностики. - Ульяновск : УлГУ, 2020. - Загл. с экрана; Неопубликованный ресурс. - Электрон. текстовые дан. (1 файл : 380 КБ). - Текст : электронный. <http://lib.ulsu.ru/MegaPro/Download/MObject/4103>
3. Методические указания для студентов по дисциплине «Лучевая диагностика» для специальности 31.05.01 «Лечебное дело» / М. Г. Шарафутдинов, В. С. Морозов, М. В. Сагель;

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УлГУ, Мед. фак., Каф. онкологии и лучевой диагностики. - Ульяновск : УлГУ, 2020. - Загл. с экрана; Неопубликованный ресурс. - Электрон. текстовые дан. (1 файл : 530 КБ). - Текст : электронный. <http://lib.ulsu.ru/MegaPro/Download/MObject/4108>


Согласовано:

Тимоф. Б.И.И. НБ УлГУ
 Должность сотрудника научной библиотеки

Степанов А.Р.
 ФИО

[Signature]
 подпись

 дата

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b) Software

name
SPS Consultant Plus
NEB RF
EBS IPRBooks
AIBS "MegaPro"
System "Antiplagiat.VUZ"
Microsoft Windows OS

MicrosoftOffice 2016
or
"MyOffice Standard"

Bought for a computer. IMEFK class:

Automated information system "Vitakor RMIS"
StatisticaBasicAcademicforWindows 13

c) Professional databases, information and reference systems

1. Electronic library systems:

1.1. IPRbooks: electronic library system: website / group of companies IPR Media. - Saratov, [2020]. - URL: <http://www.iprbookshop.ru> . - Access mode: for registered. users. - Text: electronic.

1.2. YURAYT: electronic library system: website / LLC Electronic publishing house YURAYT. - Moscow, [2020]. - URL: <https://www.biblio-online.ru> . - Access mode: for registered. users. - Text: electronic.

1.3. Student advisor: electronic library system: website / Polytekhresurs LLC. - Moscow, [2020]. - URL: http://www.studentlibrary.ru/catalogue/switch_kit/x2019-128.html. - Access mode: for registered. users. - Text: electronic.

1.4. Lan: electronic library system: website / EBS Lan. - St. Petersburg, [2020]. - URL: <https://e.lanbook.com> . - Access mode: for registered. users. - Text: electronic.

1.5. Znanium.com : electronic library system: website / Znanium LLC. - Moscow, [2020]. - URL: <http://znanium.com>. - Access mode: for registered. users. - Text: electronic.

1.6. Clinical Collection: collection for medical universities, clinics, medical libraries // EBSCOhost: [portal]. - URL : <http://web.a.ebscohost.com/ehost/search/advanced?vid=1&sid=e3ddf99-a1a7-46dd-a6eb-2185f3e0876a%40sessionmgr4008>. - Access mode: for authorization. users. - Text: electronic.


2. ConsultantPlus [Electronic resource]: reference legal system. / LLC "Consultant Plus" - Electron. Dan. - Moscow: ConsultantPlus, [2020].

3. Databases of periodicals:

3.1. Database of periodicals: electronic journals / LLC IVIS. - Moscow, [2020]. - URL: <https://dlib.eastview.com/browse/udb/12> . - Access mode: for authorization users. - Text: electronic.

3.2. eLIBRARY.RU: scientific electronic library: site / Scientific Electronic Library LLC. - Moscow, [2020]. - URL : <http://elibrary.ru> . - Access mode: for authorization. users. - Text: electronic

3.3. " Grebennikon ": electronic library / ID Grebennikov. - Moscow, [2020]. - URL : <https://id2.action-media.ru/Personal/Products> . - Access mode: for authorization. users. - Text: electronic.

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4. National Electronic Library : Electronic Library: Federal State Information System: website / Ministry of Culture of the Russian Federation; RSL. - Moscow, [2020]. - URL: <https://neb.rf>. - Access mode: for users of the scientific library. - Text: electronic.

5. SMART Imagebase // EBSCOhost : [portal]. - URL : <https://ebsco.smartimagebase.com/?TOKEN=EBSCO-1a2ff8c55aa76d8229047223a7d6dc9c&custid=s6895741>. - Access mode: for authorization. users. - Image: electronic.

6. Federal information and educational portals:

6.1. Single window of access to educational resources : federal portal / founder of FGAOU DPO TsRGOP and IT. - URL: <http://window.edu.ru/>. - Text: electronic.

6.2. Russian education : federal portal / founder of FGAOU DPO TsRGOP and IT. - URL: <http://www.edu.ru>. - Text: electronic.

7. Educational resources of UISU:


7.1. Electronic library of UISU: module ABIS Mega-PRO / Data Express LLC. - URL : <http://lib.ulsu.ru/MegaPro/Web>. - Access mode: for users of the scientific library. - Text: electronic.

7.2. UISU educational portal. - URL: <http://edu.ulsu.ru>. - Access mode: for register. users. - Text: electronic.

Agreed:

Зам. канд. наук | Кушнерова Д.В. | [Signature]

Position of UITYT employee Full name Signature Date

Ministry of Science and Higher Education of the Russian Federation Ulyanovsk State University	The form	
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12. MATERIAL AND TECHNICAL SUPPORT OF THE DISCIPLINE:

Auditoriums for lectures, seminars, for monitoring and intermediate certification, group and individual consultations.

The auditoriums are equipped with specialized furniture, a training board. Lecture rooms are equipped with multimedia equipment to provide information to a large audience. Premises for independent work are equipped with computer equipment with the ability to connect to the Internet and provide access to the electronic information and educational environment, the electronic library system. The list of equipment used in the educational process is indicated in accordance with the information on the material and technical support and equipment of the educational process posted on the official website of UISU in the section "Information about the educational organization".

1. Methodical recommendations on all topics of the course.
2. Negatoscope.
3. A set of computer tomograms.
4. A set of sonograms, scans
5. A set of magnetic resonance imaging.
6. Tables, chairs, whiteboard
7. Flexible fiber endoscope, flexible bronchoscope.
8. Computers with Internet access.
9. Multimedia projector, screen, overhead projector

13. SPECIAL CONDITIONS FOR STUDENTS WITH DISABLED POSSIBILITIES

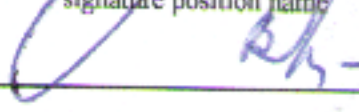
If necessary, students from among persons with disabilities (at the request of the student) can be offered one of the following options for the perception of information, taking into account their individual psychophysical characteristics:

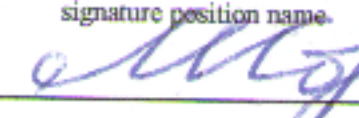
for persons with visual impairments: in printed form in an enlarged font; in the form of an electronic document; in the form of an audio file (translation of educational materials into audio format); in printed form in Braille; individual consultations with the involvement of a tiflosurd interpreter; individual assignments and consultations;

for persons with hearing impairments: in printed form; in the form of an electronic document; videos with subtitles; individual consultations with the involvement of a sign language interpreter; individual assignments and consultations;



for persons with disabilities of the musculoskeletal system: in printed form; in the form of an electronic document; in the form of an audio file; individual assignments and consultations.

Developer  Sherevaldinov M.G., head of the department, c.m.s., associate professor.

Developer  Morozov V.S., c.m.s., associate professor.

Developer  Sagel M.V., c.m.s., associate professor.

CHANGE SHEET
to the work program "Radiation diagnostics"
specialty 31.05.01 "Medical business"

№ п/п	The content of the change or a link to the attached text of the change	Full name of the head of the department implementing the discipline/ starting department	the Signature	Date
1	Amendments to item a) The list of recommended literature item 11 "Educational, methodological and informational support of the discipline" with the design of Appendix 1	Sharafutdinov M.G.		31.08. 2022
2	Amendments to p.p. c) Professional databases, information and reference systems p. 11 "Educational, methodological and information support of the discipline" with the design of Appendix 2	Sharafutdinov M.G.		31.08. 2022

11. УЧЕБНО-МЕТОДИЧЕСКОЕ И ИНФОРМАЦИОННОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ

а) Список рекомендуемой литературы

основная

1. Терновая С.К., Лучевая диагностика и терапия. Частная лучевая диагностика / Терновой С. К. и др. - М. : ГЭОТАР-Медиа, 2014. - 356 с. - ISBN 978-5-9704-2990-7 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <http://www.studentlibrary.ru/book/ISBN9785970429907.html>
2. Илясова Е.Б., Лучевая диагностика : учебное пособие / Илясова Е. Б., Чехонацкая М. Л., Приезжева В. Н. - М. : ГЭОТАР-Медиа, 2016. - 280 с. - ISBN 978-5-9704-3789-6 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <http://www.studentlibrary.ru/book/ISBN9785970437896.html>
3. Trufanov, G. E. Diagnostic radiology : textbook / G. E. Trufanov, R. M. Akiev, K. N. Alekseev [et al.] ; ed. G. E. Trufanov. - Москва : ГЭОТАР-Медиа, 2021. - 444 с. - ISBN 978-5-9704-5963-8. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970459638.html>

дополнительная:

1. Васильев А.Ю., Лучевая диагностика / Васильев А.Ю., Ольхова Е.Б. - М. : ГЭОТАР-Медиа, 2008. - 688 с. - ISBN 978-5-9704-0612-0 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <http://www.studentlibrary.ru/book/ISBN9785970406120.html>
2. Шехтман, А. Г. Современные методы лучевой диагностики патологии черепа и позвоночника, головного и спинного мозга : учебное пособие / А. Г. Шехтман, Д. Ю. Коновалов, О. Я. Малыгина. — Оренбург : Оренбургская государственная медицинская академия, 2014. — 55 с. — ISBN 2227-8397. — Текст : электронный // Электронно-библиотечная система IPR BOOKS : [сайт]. — URL: <http://www.iprbookshop.ru/51488.html>
3. Ультразвуковое исследование органов брюшной полости и поверхностных структур : электронный учебный курс / М. В. Сагель, Р. К. Корженевич, В. С. Морозов, М. А. Танеева. - Ульяновск : УлГУ, 2017. - . - URL: <https://portal.ulsu.ru/course/view.php?id=94494>. - Режим доступа: Портал ЭИОС УлГУ. - Текст : электронный.
4. Хоров А. О. Clinical tasks in oncology = Клинические задачи по онкологии : пособие для студентов факультета иностранных студентов с английским языком обучения (специальность 1-79 01 01 «Лечебное дело») [на англ. яз.] : handbook for the foreign students of the Medical Faculty / А. О. Хоров, А. В. Каравай, К. Н. Угляница. - Гродно : ГрГМУ, 2018. - 72 с. - ISBN 9789855589533. - Текст : электронный // ЭБС "Букап" : [сайт]. - URL : <https://www.books-up.ru/ru/book/sclinical-tasks-in-oncology-12199649/>

учебно-методическая:

1. Methodological instructions for preparation for practical studies of students on the discipline «Radiation diagnosis» for specialty 31.05.01 «General medicine» / M. G. Sharafutdinov, L. V. Matveeva. - Ulyanovsk : UISU, 2022. - Неопубликованный ресурс; На англ. яз. - URL: <http://lib.ulsu.ru/MegaPro/Download/MObject/11516>. - Режим доступа: ЭБС УлГУ. - Текст : электронный.
1. 2. Guidelines for independent work of students in the discipline «Radiation diagnosis» for specialty 31.05.01 «General medicine» / M. G. Sharafutdinov, L. V. Matveeva. - Ulyanovsk : UISU, 2022. - Неопубликованный ресурс; На англ. яз. - URL: <http://lib.ulsu.ru/MegaPro/Download/MObject/11511>. - Режим доступа: ЭБС УлГУ. - Текст : электронный.

Согласовано:

Главный библиотекарь НБ УлГУ/ Стадольникова Д.Р./

Должность сотрудника научной библиотеки

ФИО

подпись

дата

Стар 2022

в) Профессиональные базы данных, информационно-справочные системы**1. Электронно-библиотечные системы:**

1.1. Цифровой образовательный ресурс IPRsmart : электронно-библиотечная система : сайт / ООО Компания «Ай Пи Ар Медиа». - Саратов, [2022]. – URL: <http://www.iprbookshop.ru>. – Режим доступа: для зарегистрир. пользователей. - Текст : электронный.

1.2. Образовательная платформа ЮРАЙТ : образовательный ресурс, электронная библиотека : сайт / ООО Электронное издательство ЮРАЙТ. – Москва, [2022]. - URL: <https://urait.ru>. – Режим доступа: для зарегистрир. пользователей. - Текст : электронный.

1.3. База данных «Электронная библиотека технического ВУЗа (ЭБС «Консультант студента») : электронно-библиотечная система : сайт / ООО Политехресурс. – Москва, [2022]. – URL: <https://www.studentlibrary.ru/cgi-bin/mb4x>. – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.

1.4. Консультант врача. Электронная медицинская библиотека : база данных : сайт / ООО Высшая школа организации и управления здравоохранением-Комплексный медицинский консалтинг. – Москва, [2022]. – URL: <https://www.rosmedlib.ru>. – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.

1.5. Большая медицинская библиотека : электронно-библиотечная система : сайт / ООО Букап. – Томск, [2022]. – URL: <https://www.books-up.ru/ru/library/>. – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.

1.6. ЭБС Лань : электронно-библиотечная система : сайт / ООО ЭБС Лань. – Санкт-Петербург, [2022]. – URL: <https://e.lanbook.com>. – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.

1.7. ЭБС Znanium.com : электронно-библиотечная система : сайт / ООО Знаниум. - Москва, [2022]. - URL: <http://znanium.com>. – Режим доступа : для зарегистрир. пользователей. - Текст : электронный.

1.8. Clinical Collection : научно-информационная база данных EBSCO // EBSCOhost : [портал]. – URL: <http://web.b.ebscohost.com/ehost/search/advanced?vid=1&sid=9f57a3e1-1191-414b-8763-e97828f9f7e1%40sessionmgr102>. – Режим доступа : для авториз. пользователей. – Текст : электронный.

1.9. База данных «Русский как иностранный» : электронно-образовательный ресурс для иностранных студентов : сайт / ООО Компания «Ай Пи Ар Медиа». – Саратов, [2022]. – URL: <https://ros-edu.ru>. – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.

2. КонсультантПлюс [Электронный ресурс]: справочная правовая система. /ООО «Консультант Плюс» - Электрон. дан. - Москва : КонсультантПлюс, [2022].

3. Базы данных периодических изданий:

3.1. База данных периодических изданий EastView : электронные журналы / ООО ИВИС. - Москва, [2022]. – URL: <https://dlib.eastview.com/browse/udb/12>. – Режим доступа : для авториз. пользователей. – Текст : электронный.

3.2. eLIBRARY.RU: научная электронная библиотека : сайт / ООО Научная Электронная Библиотека. – Москва, [2022]. – URL: <http://elibrary.ru>. – Режим доступа : для авториз. пользователей. – Текст : электронный

3.3. Электронная библиотека «Издательского дома «Гребенников» (Grebinnikon) : электронная библиотека / ООО ИД Гребенников. – Москва, [2022]. – URL: <https://id2.action-media.ru/Personal/Products>. – Режим доступа : для авториз. пользователей. – Текст : электронный.

4. **Федеральная государственная информационная система «Национальная электронная библиотека»** : электронная библиотека : сайт / ФГБУ РГБ. – Москва, [2022]. – URL: <https://нэб.рф>. – Режим доступа : для пользователей научной библиотеки. – Текст : электронный.

5. **SMART Imagebase** : научно-информационная база данных EBSCO // EBSCOhost : [портал]. – URL: <https://ebSCO.smartimagebase.com/?TOKEN=EBSCO-1a2ff8c55aa76d8229047223a7d6dc9c&custid=s6895741>. – Режим доступа : для авториз. пользователей. – Изображение : электронные.

6. Федеральные информационно-образовательные порталы:

6.1. Единое окно доступа к образовательным ресурсам : федеральный портал . – URL: <http://window.edu.ru/> . – Текст : электронный.

6.2. Российское образование : федеральный портал / учредитель ФГАУ «ФИЦТО». – URL: <http://www.edu.ru>. – Текст : электронный.

7. Образовательные ресурсы УлГУ:

7.1. Электронная библиотечная система УлГУ : модуль «Электронная библиотека» АБИС Мега-ПРО / ООО «Дата Экспресс». – URL: <http://lib.ulsu.ru/MegaPro/Web>. – Режим доступа : для пользователей научной библиотеки. – Текст : электронный.

Согласовано:


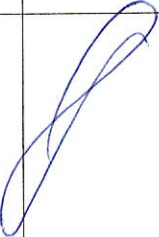
зачи наг Улт
Должность сотрудника УИТИТ


Ключевы В
ФИО

[Подпись]
подпись дата

LIST OF CHANGES of

**Educational plan of discipline "Radiation diagnostics"
specialty 31.05.01 "Medical business"**

№ п/п	The content of the change or a link to the attached text of the change	Full name of the head of the department implementing the discipline/ starting department	the Signature	Date
1	Amendments to item a) The list of recommended literature item 11 "Educational, methodological and informational support of the discipline" with the design of Appendix 1	Sharafutdinov M.G.		29.06. 2023
2	Amendments to p.p. c) Professional databases, information and reference systems p. 11 "Educational, methodological and information support of the discipline" with the design of Appendix 2	Sharafutdinov M.G.		29.06. 2023

Ministry of Science and Higher Education of the Russian Federation Ulyanovsk State University	The form	
F-Work program of the discipline		

11. УЧЕБНО-МЕТОДИЧЕСКОЕ И ИНФОРМАЦИОННОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ

а) Список рекомендуемой литературы

основная

1. Trufanov, G. E. Diagnostic radiology : textbook / G. E. Trufanov, R. M. Akiev, K. N. Alekseev [et al.] ; ed. G. E. Trufanov. - Москва : ГЭОТАР-Медиа, 2021. - 444 с. - ISBN 978-5-9704-5963-8. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970459638.html>

2. Кира, Е. Ф. The basic questions of oncogynecology Основные вопросы онкогинекологии : учебник на английском и русском языках / Кира Е. Ф. [и др.]. - Москва : ГЭОТАР-Медиа, 2018. - 288 с. - ISBN 978-5-9704-4565-5. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970445655.html>

дополнительная:

1 Каравай А. В. Clinical Oncology in two parts. Part I = Клиническая онкология в двух частях. Часть I : пособие для студентов учреждений высшего образования, обучающихся по специальности 1-79 01 01 «Лечебное дело» : manual for students of higher education institutions studying in the specialty 1-79 01 01 «General Medicine» / А. В. Каравай, Г. Г. Божко. - Гродно : ГрГМУ, 2018. - 304 с. - ISBN 9789855589892. - Текст : электронный // ЭБС "Букап" : [сайт]. - URL : <https://www.books-up.ru/ru/book/clinical-oncology-in-two-parts-part-i-12199149/>

2. Хоров А. О. Clinical tasks in oncology = Клинические задачи по онкологии : пособие для студентов факультета иностранных студентов с английским языком обучения (специальность 1-79 01 01 «Лечебное дело») [на англ. яз.] : handbook for the foreign students of the Medical Faculty / А. О. Хоров, А. В. Каравай, К. Н. Угляница. - Гродно : ГрГМУ, 2018. - 72 с. - ISBN 9789855589533. - Текст : электронный // ЭБС "Букап" : [сайт]. - URL : <https://www.books-up.ru/ru/book/slinical-tasks-in-oncology-12199649/>

3 Antoneeva I. I. Studying oncology: the selected chapters : Tutorial / I. I. Antoneeva; Ulyanovsk State University, Faculty of Medicine. - Ulyanovsk : UISU, 2021. - 172 p. - На англ. яз.; Загл. с экрана. - URL: <http://lib.ulsu.ru/MegaPro/Download/MObject/14450>.

учебно-методическая

1. Sharafutdinov M. G.

Guidelines for independent work of students in the discipline «Radiation diagnosis» for specialty 31.05.01 «General medicine» / M. G. Sharafutdinov, L. V. Matveeva. - Ulyanovsk : UISU, 2022. - Неопубликованный ресурс; На англ. яз. - URL: <http://lib.ulsu.ru/MegaPro/Download/MObject/11511>. - Режим доступа: ЭБС УлГУ. - Текст : электронный.

2. Sharafutdinov M. G.

Methodological instructions for preparation for practical studies of students on the discipline «Radiation diagnosis» for specialty 31.05.01 «General medicine» / M. G. Sharafutdinov, L. V. Matveeva. - Ulyanovsk : UISU, 2022. - Неопубликованный ресурс; На англ. яз. - URL: <http://lib.ulsu.ru/MegaPro/Download/MObject/11516>. - Режим доступа: ЭБС УлГУ. - Текст : электронный.

Согласовано:

Специалист ведущий НБ УлГУ/ Стадольникова Д.Р./

Должность сотрудника научной библиотеки

ФИО

подпись

дата

Стас 10.05.2023

б) Программное обеспечение

1. ОС Microsoft Windows;
2. Microsoft OfficeStd 2016 RUS.

в) Профессиональные базы данных, информационно-справочные системы**1. Электронно-библиотечные системы:**

1.1. Цифровой образовательный ресурс IPRsmart:электронно-библиотечная система : сайт / ООО Компания«Ай Пи Ар Медиа». - Саратов, [2023]. –URL:<http://www.iprbookshop.ru>. – Режим доступа: для зарегистрир. пользователей. - Текст : электронный.

1.2. Образовательная платформа ЮРАЙТ :образовательный ресурс, электронная библиотека : сайт / ООО Электронное издательство«ЮРАЙТ». – Москва, [2023]. - URL: <https://urait.ru>. – Режим доступа: для зарегистрир. пользователей. - Текст : электронный.

1.3. База данных «Электронная библиотека технического ВУЗа (ЭБС «Консультант студента»):электронно-библиотечная система : сайт / ООО «Политехресурс». – Москва, [2023]. –URL:<https://www.studentlibrary.ru/cgi-bin/mb4x>. – Режим доступа: для зарегистрир. пользователей. –Текст : электронный.

1.4. Консультант врача. Электронная медицинская библиотека :база данных : сайт / ООО «Высшая школа организации и управления здравоохранением-Комплексный медицинский консалтинг». – Москва, [2023]. – URL: <https://www.rosmedlib.ru>. – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.

1.5. Большая медицинская библиотека : электронно-библиотечная система : сайт / ООО «Букап». – Томск, [2023]. – URL: <https://www.books-up.ru/ru/library/> . – Режим доступа: для зарегистрир. пользователей. – Текст : электронный.

1.6. ЭБС Лань:электронно-библиотечная система : сайт/ ООО ЭБС «Лань». –Санкт-Петербург, [2023]. –URL:<https://e.lanbook.com>. – Режим доступа: для зарегистрир. пользователей. –Текст : электронный.

1.7. ЭБС **Znanium.com**:электронно-библиотечная система : сайт / ООО «Знаниум». - Москва, [2023]. - URL: <http://znanium.com> . – Режим доступа: для зарегистрир. пользователей. - Текст : электронный.

2. КонсультантПлюс [Электронный ресурс]: справочная правовая система. /ООО «Консультант Плюс» - Электрон. дан. - Москва :КонсультантПлюс, [2023].

3.Базы данных периодических изданий:

3.1. eLIBRARY.RU: научная электронная библиотека : сайт / ООО «Научная Электронная Библиотека». – Москва, [2023]. – URL: <http://elibrary.ru>. – Режим доступа : для авториз. пользователей. – Текст : электронный

3.2. Электронная библиотека «Издательского дома «Гребенников» (Grebinnikon) : электроннаябиблиотека / ООО ИД «Гребенников». – Москва, [2023]. – URL: <https://id2.action-media.ru/Personal/Products>. – Режим доступа : для авториз. пользователей. – Текст : электронный.

4. Федеральная государственная информационная система «Национальная электронная библиотека»:электронная библиотека: сайт / ФГБУ РГБ. – Москва, [2023]. – URL:<https://нэб.рф>. – Режим доступа: для пользователей научной библиотеки. –Текст : электронный.

5. Российское образование: федеральный портал / учредитель ФГАУ «ФИЦТО». – URL: <http://www.edu.ru>. – Текст : электронный.

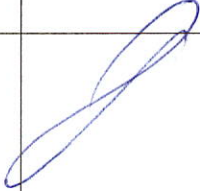
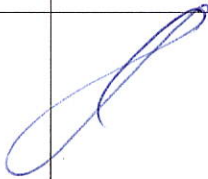
6. Электронная библиотечная система УлГУ : модуль «Электронная библиотека» АБИС Мега-ПРО / ООО «Дата Экспресс». – URL:<http://lib.ulsu.ru/MegaPro/Web>. – Режим доступа :для пользователей научной библиотеки. – Текст : электронный.

Согласовано:

Ведущий инженер / Щуренко Ю.В. /  / _____ / _____
Должность сотрудника УИТТ / ФИО / подпись / дата

LIST OF CHANGES of

**Educational plan of discipline "Radiation diagnostics"
specialty 31.05.01 "Medical business"**

№ п/п	The content of the change or a link to the attached text of the change	Full name of the head of the department implementing the discipline/ starting department	the Signature	Date
1	Amendments to item a) The list of recommended literature item 11 "Educational, methodological and informational support of the discipline" with the design of Appendix 1	Sharafutdinov M.G.		27.06. 2024
2	Amendments to p.p. c) Professional databases, information and reference systems p. 11 "Educational, methodological and information support of the discipline" with the design of Appendix 2	Sharafutdinov M.G.		27.06. 2024

11. УЧЕБНО-МЕТОДИЧЕСКОЕ И ИНФОРМАЦИОННОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ

а) Список рекомендуемой литературы

основная

1. Trufanov, G. E. Diagnostic radiology :textbook / G. E. Trufanov, R. M. Akiev, K. N. Alekseev [etal.] ; ed. G. E. Trufanov. - Москва : ГЭОТАР-Медиа, 2021. - 444 с. - ISBN 978-5-9704-5963-8. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970459638.html>

2. Кира, Е. Ф. The basic questions of oncogynecology Основные вопросы онкогинекологии : учебник на английском и русском языках / Кира Е. Ф. [и др.]. - Москва : ГЭОТАР-Медиа, 2018. - 288 с. - ISBN 978-5-9704-4565-5. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <https://www.studentlibrary.ru/book/ISBN9785970445655.html>

дополнительная:

1 Каравай А. В. Clinical Oncology in two parts. Part I = Клиническая онкология в двух частях. Часть I : пособие для студентов учреждений высшего образования, обучающихся по специальности 1-79 01 01 «Лечебное дело» : manual for students of higher education institutions studying in the specialty 1-79 01 01 «General Medicine» / А. В. Каравай, Г. Г. Божко. - Гродно : ГрГМУ, 2018. - 304 с. - ISBN 9789855589892. - Текст : электронный // ЭБС "Букап" : [сайт]. - URL : <https://www.books-up.ru/ru/book/clinical-oncology-in-two-parts-part-i-12199149/>

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