

APPROVED  
Rector of the Federal State Budgetary  
Educational Institution of Higher  
Education "North-Ossetian State Medical  
Academy" the Ministry of Health of the  
Russian Federation (in abbreviated form-  
NOSMA MOH Russia)



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«24» May, 2023

**EDUCATIONAL TRAINING PROGRAM OF DISCIPLINE  
“RADIATION DIAGNOSTICS”**

the main professional educational program of higher education - specialty program in the  
specialty 31.05.01 General Medicine, approved, May , 24, 2023

Form of education	Full-time
The period of development	6
Department of Radiation Diagnostics and Radiotherapy with Oncology	

When developing an educational training program, the discipline is based on:

1. Federal State Educational Standard of Higher Education on specialty 31.05.01 General Medicine, approved by the Ministry of Education and Science of the Russian Federation on February, 09, 2016 №95
2. Academic plan on specialty 31.05.01 General Medicine,  
ЛД-16-04-18 ИИ  
ЛД-16-05-19 ИИ  
ЛД-16-06-20 ИИ,  
approved by the Scientific Council of the Federal State Budgetary Educational Institution of Higher Education «North-Ossetia State Medical Academy» of the Ministry of Healthcare of the Russian Federation “24” May 2023, Protocol № 8.

The educational training program of the discipline was approved at a meeting of the central coordinating training and methodological council from “23” May 2023, Protocol №. 5

The educational training program of the discipline was approved by the Scientific Council of the State Medical University of the Federal State Budgetary Educational Institution of Higher Education «North-Ossetia State Medical Academy» of the Ministry of Healthcare of the Russian Federation from “24” May 2023, Protocol № 8.

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## Contents of the educational work program

1. name of the discipline;
2. list of the planned objectives in the discipline training, correlated with the planned results of mastering the educational program;
3. indication of the place of the discipline in the structure of the educational program;
4. the amount of the discipline in credit units, with indication of the number of academic or astronomical hours allocated to the contact work of students with the teacher (by types of training sessions) and to the independent work of students;
5. content of the discipline, structured according to topics (sections) with indication of the number of academic or astronomical hours assigned to them and types of training sessions;
6. list of educational and methodological support for independent work of students in the discipline;
7. fund of evaluation tools for conducting intermediate certification of trainees in the discipline;
8. list of basic and additional educational literature necessary for mastering the discipline;
9. list of resources of the information and telecommunication network "Internet" (hereinafter referred to as the "Internet" network) necessary for mastering the discipline;
10. instructions for students in methods of mastering the discipline;
11. list of information technologies used in implementing the educational process for the discipline, including a list of software and information reference systems (if necessary);
12. description of the material and technical base necessary for implementing the educational process for the discipline.

### 1. Requirements for the results of mastering the discipline "Radiation diagnostics"

code 31.05.01 - medical treatment:

The study of the discipline is aimed at obtaining the following professional competencies (PC) by students:

№	Competence code	Contents of the competence (or of its parts)
1.	(GPC-9);	ability to assess morphofunctional, physiological states and pathological processes in the human body to solve professional problems
2.	(PC-1);	ability to assess morphofunctional, physiological states and pathological processes in the human body to solve professional problems
3.	(PC-5);	readiness to collect and analyze patient complaints, data of his anamnesis, examination results, laboratory, instrumental, pathological and anatomical and other studies to recognize the condition or establishing the fact of the presence or absence of the disease
4.	(PC-6);	- ability to determine the patients in the main pathological conditions, symptoms, syndromes of diseases, nosological forms in accordance with International Statistical Classification of Diseases and Related Problems health, revision adopted by the 43rd World Health Assembly, Geneva, 1989.
5.	(PC-7);	willingness to conduct an examination of temporary disability, participation in the conduct of medical and social expertise, ascertaining the biological death of a person.
6.	(PC-21);	ability to participate in carrying scientific research.

## 2. The list of the planned results of training in the discipline and the results of mastering the educational program

№ №	Competence number	contents of the discipline (or part of the discipline)	objectives		
			to know	to be able to	to have skills in
1	2	3	4	5	6
1.	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Introduction. General questions of radiation diagnosis.	the history of the development of roentgenology, the structure of the X-ray tube, the cabinet, methods of protection from radiation, methods of roentgenography, CT, MRT, ultrasound, etc. Methods for detecting radiation. Radiopharmaceutical drugs, requirements to them.	recognize the method of radiation study of patients with different pathologies, the carrier and qualities image, whether or not the contrast agent, the research body, was applied.	mastering the radiation method of patient research (fluoroscopy, radiography), organ folds for various pathologies, methods of protecting patients and staff (lead aprons, diapers, etc.)
2.	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Radiation diagnosis in neurology	the x-ray anatomy of the skull and spine, brain and spinal cord, methods of radiation diagnosis (radiography, CT, MRT, etc.), contrast agents used in special research methods, pathological symptoms.	To be able to recognize the method of research, projection, pathological symptoms, compile a protocol describing the picture according to the scheme and draw a conclusion.	using methods of radiation diagnostics-radiography to analyze and interpret the results of modern diagnostic technologies by differential diagnostics, methods of conducting medical documentation
3.	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Lungs in X-ray imaging	the x-ray of the anatomy of the chest, methods of radiation diagnosis (radiography, CT, etc.); contrast agents used in special research methods, pathological symptoms; the organization of a massive	recognize the method of research, projection, pathological symptoms, compile a protocol describing the snapshot according to the scheme and draw a conclusion.	using methods of radiation diagnostics to analyze and interpret the results of modern diagnostic technologies, differential diagnostics, methods of medical records

			fluorographic examination with the view of early detection of tuberculosis.		management
4.	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Radiation diagnosis of the heart and large vessels.	the x-ray of the anatomy of the heart, the methods of radiation diagnosis (radiography, ultrasound, CT, MRT, etc.), contrast agents used in special research methods, pathological symptoms.	recognize the method of research, projection, pathological symptoms, compile a protocol describing the snapshot according to the scheme and draw a conclusion.	using methods of radiation diagnostics to analyze and interpret the results of modern diagnostic technologies, differential diagnostics, methods of medical records management.
5.	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Bone-joint system in the x-ray image in children.	the x-ray anatomy of the bone system, methods of radiation diagnosis (radiography, CT, MRT, etc.), contrast agents used in special research methods, pathological symptoms.	recognize the method of research, projection, pathological symptoms, compile a protocol describing the snapshot according to the scheme and draw a conclusion.	using methods of radiation diagnostics to analyze and interpret the results of modern diagnostic technologies, differential diagnostics, methods of medical records management
6.	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Methods of radiation diagnosis of diseases of the esophagus, stomach, intestines.	the x-ray anatomy of the gastrointestinal tract, methods of radiation diagnosis (radiography, CT, MRT, etc.), contrast agents used in special research methods, pathological symptoms.	recognize the method of research, projection, pathological symptoms, compile a protocol describing the snapshot according to the scheme and draw a conclusion.	ability and readiness to analyze and interpret the results of modern diagnostic technologies, differential diagnosis, methods of medical records.
7.	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Complex radiation diagnosis of diseases of the hepato-pancreato-biliary system.	the x-ray of the anatomy of the liver, gallbladder, methods of radiation diagnosis (radiography, ultrasound, CT,	recognize the method of research, projection, pathological symptoms, compile a	using methods of radiation diagnostics, analyze and interpret the results of modern

			MRT, etc.), contrast agents used in special research methods, pathological symptoms.	protocol describing the snapshot according to the scheme and draw a conclusion.	diagnostic technologies, differential diagnostics, methods of medical records management.
8.	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Complex radiation study of kidneys and urinary tract	the x-ray anatomy of the urinary system, methods of radiation diagnosis (radiography, CT, MRT, etc.), contrast agents used in special research methods, pathological symptoms.	recognize the method of research, projection, pathological symptoms, draw up a protocol describing the snapshot according to the scheme and put a conclusion.	using methods of radiation diagnostics, analyze and interpret the results of modern diagnostic technologies, differential diagnostics, methods of medical records management.
9.	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Mammography. Radiation diagnosis of genital organs.	the x-ray of the anatomy of the breast, uterus, prostate, methods of radiation diagnosis (radiography, ultrasound, CT, MRI, etc.), contrast agents used in special research methods, pathological symptoms.	recognize the method of research, projection, pathological symptoms, compile a protocol describing the snapshot according to the scheme and draw a conclusion.	using methods of radiation diagnostics, analyze and interpret the results of modern diagnostic technologies, differential diagnostics, methods of medical records management.
10	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	Radiation diagnosis in otorhinolaryngology, endocrine system	the x-ray of the anatomy of the ear, throat, paranasal sinuses and thyroid gland, methods of radiation diagnosis (radiography, ultrasound, CT, MRT, etc.), contrast agents used in special research methods, pathological symptoms.	recognize the method of research, projection, pathological symptoms, compile a protocol describing the snapshot according to the scheme and draw a conclusion.	using radiation diagnostics methods, analyze and interpret the results of modern diagnostic technologies, differential diagnostics, methods of medical records management.

### 3. The place of the discipline in the structure of The Main Professional Educational Program of Higher Education

1. Discipline "Radiation diagnostics" refers to the Block 1 of the Federal State Educational Standard in the specialty "**MEDICAL TREATMENT**"

The types of professional activities that underlie the teaching of this discipline:

1. Preventive.
2. Diagnostic.
3. Scientific and research.

#### 4. Scope of the discipline

№ №	Type of work	Total number of credit units (CU)	Total number of hours	semesters	
				6	6
				hours	hours
1	2	3	4	5	6
<b>1</b>	<b>Contact interaction of students and teachers including:</b>				
2	lectures (L)	0,3	12	12	
3	Clinical practical classes (CPC)	1	36	36	
4	Seminars (S)				
5	Laboratory works (LW)				
<b>6</b>	<b>Students' independent work (SIW)</b>	0,7	24	24	
<b>7</b>	<b>Type of intermediate certifying</b>	credit (C)	+	+	+
		exam (E)	-	-	-
<b>8</b>	<b>TOTAL: labor intensity</b>	hours	72	72	
		CU	2		

#### 5. Discipline contents

№	Semester №	Names of the section of the discipline (module)	Types of educational activities, including independent work of students (in hours)					Form of the current progress control
			L	LW	CPC	SIW	total	
1.	5	Introduction. General issues of radiation diagnosis and radiology.	2	-	3	2	7	I, ST.
2.	5	Radiation diagnosis in neurology	-	-	3	2	5	I, ST.
3.	5	Lungs in the ray imaging	2	-	3	3	8	I, ST, TT, TrT.
4	5	Radiation diagnosis of the heart and large vessels.	-	-	3	2	5	I, ST, TT, Y3 TrT.
5.	5	Bone-joint system in	2	-	3	2	7	I, ST, TT

		the radial image in adults and children.						
6.	5	Methods of radiation diagnosis of diseases of the esophagus, stomach, intestines. Malformations and abnormalities in children.	2	-	3	3	8	I, ST, TT, TrT.
7.	5	Complex radiation diagnosis of diseases of the hepato-pancreato-biliary system.	-	-	3	3	6	I, ST, TT, TrT.
8.	5	Complex radiation study of kidneys and urinary tract	2	-	3	3	8	I, ST, TT, TrT.
9.	5	Mammography. Radiation diagnosis of genital organs.	-	-	3	2	5	I, ST, TT
10.	5	Radiation diagnosis in otorhinolaryngology, endocrine system	-	-	3	2	5	I, ST, TT
11.	5	Modular seminar	-	-	3	-	3	I, ST, TT
12.	5	credit	-	-	3	-	3	I, ST, TT
		<b>Total:</b>	12		36	24	72	

**Note:** I - interview, TT - test tasks, ST - situational tasks, TrT - training tasks

#### 6. List of educational and methodological aids for independent work of students

№	Semester №	name of the teaching methodical aid
1.	5	Tutorial: "Physical basis of radiation diagnosis and radiation therapy." Vladikavkaz. 2008. (associate professor, Candidate of Medicine Olisaeva E.T.).
2.	5	Tutorial: "Physical fundamentals of radiology. Radioactivity, radioactive radiation, their characteristics. Radionuclide Diagnostics". Vladikavkaz. 2008. (Associate Professor, Candidate of Medicine Olisaeva E.T., Professor, Doctor of Medicine, S.G. Georgiady, assistants Candidate of Medicine I.H.Korayeva, Z.R. Sozaonty).
3.	5	Tutorial: "Radiation diagnostics of diseases of the pancreas and spleen, spinal cord and brain." Vladikavkaz. 2009. (Associate Professor E.T. Olisaeva, Professor S.G Georgiady, Assistant Z.R. Sozaonty, Candidate of Medicine I.H. Koraeva)
		Tutorial: "Radiation diagnosis of diseases of the esophagus, stomach, intestines" Vladikavkaz. 2009. (Associate Professor E.T. Olisaeva, Professor S.G Georgiady, Assistant Z.R. Sozaonty, Candidate of Medicine I.H. Koraeva)



<b>5.</b>	<b>5</b>	Tutorial: "Radiation diagnosis of diseases of the urinary system, liver and biliary tract and the reproductive system of women. Vladikavkaz. 2010. (Associate Professor E.T. Olisaeva, Professor S.G Georgiady, Assistant Z.R. Sozaonty, Candidate of Medicine I.H. Koraeva)
<b>6.</b>	<b>5</b>	Tutorial: "Radiation diagnosis of diseases of the musculoskeletal system." Vladikavkaz. 2010. (Associate Professor E.T. Olisaeva, Professor S.G Georgiady, Candidate of Medicine I.H. Koraeva, Assistant Z.R. Sozaonty,)
<b>7.</b>	<b>5</b>	Tutorial: "Radiation diagnosis of lung diseases." Vladikavkaz. 2011. (Associate Professor E.T. Olisaeva, Assistant Z.A. Karatseva, Candidate of Medicine I.H. Koraeva)
<b>8.</b>	<b>5</b>	Tutorial: "Radiation diagnosis of the heart and blood vessels." Methodical manual. Vladikavkaz. 2011. (Associate Professor E.T. Olisaeva, Assistants Z.A. Karatseva, I.H. Koraeva)
<b>9.</b>	<b>5</b>	Tutorial: Biological fundamentals of radiotherapy. Classification and planning of radiation therapy. Vladikavkaz. 2012. (Associate Professor I.H. Koraeva, Assistant, Candidate of Medicine E.M. Gannoshenko, Candidate of Medicine Z.R. Sozaonty, Alieva E.A. Kubantseva I.E.)
<b>10.</b>	<b>5</b>	Tutorial: "Technological fundamentals of radiotherapy. Radiation therapy of malignant tumors. Reaction of the body to radiation treatment. " Vladikavkaz. 2012. (Associate Professor I.H. Koraeva, Assistant, Candidate of Medicine E.M. Gannoshenko, Candidate of Medicine Z.R. Sozaonty, Alieva E.A. Kubantseva I.E.)
<b>11.</b>	<b>5</b>	Methodical recommendations for independent out-of-class work of students on the cycle of Radiation Diagnostics and Radiation Therapy. Vladikavkaz. 2010. (Associate Professor E.T. Olisaeva, Professor S.G Georgiady, Candidate of Medicine I.H. Koraeva, Z.R. Sozaonty)
<b>12.</b>	<b>5</b>	Methodical manual for practical classes on radiation diagnostics and radiotherapy № 10. Vladikavkaz. 2010. (Associate Professor, Candidate of Medicine E.T. Olisaeva, Candidate of Medicine I.H. Koraeva)
<b>13.</b>	<b>5</b>	Thematic laminated tables

### 7. Fund of Evaluation Means for the Intermediate Certification of Students in the Discipline

<b>№</b>	<b>List of competences</b>	<b>semester №</b>	<b>Assessment indicator (s)</b>	<b>Assessments criterion (criteria)</b>	<b>Assessment scale</b>	<b>Name of the State Federal Standard</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>1.</b>	GPC-9, PC-1, PC-5, PC-6, PC-7, PC-21	<b>5</b>	See: standard for the evaluation of the quality of education, approved by the order of State Budget Educational Institution of Higher Professional Education "NORTH-OSSETIAN STATE MEDICAL ACADEMY" Ministry of Health of the Russian Federation 20.08.2014, №211/o	See: standard for the evaluation of the quality of education, approved by the order of State Budget Educational Institution of Higher Professional Education "NORTH-OSSETIAN STATE MEDICAL ACADEMY" Ministry of Health of the Russian Federation 20.08.2014, №211/o	See: standard for the evaluation of the quality of education, approved by the order of State Budget Educational Institution of Higher Professional Education "NORTH-OSSETIAN STATE MEDICAL ACADEMY" Ministry of Health of the Russian Federation 20.08.2014, №211/o	Questions to the credit; Test tasks; Control tasks

## 8. Recommended literature list

### Basic list

№	Title	Author(s)	Year and place of publication	Number of copies		Name in Electronic Student library
				in the library	at the department	Reference in Electronic Student library
1	2	3	4	5	6	7
	Radiation Diagnosis: textbook. V.1	Ed. G. E. Trufanov	M.: GEOTAR-Media, 2009 2011	198	1	“Student consultant” <a href="http://www.studmedlib.ru/ru/book/ISBN9785970419274.html">http://www.studmedlib.ru/ru/book/ISBN9785970419274.html</a>
	Radiation Diagnosis: textbook.	Ed. G. E. Trufanov	M.: GEOTAR-Media, 2010 2015	1		“Student consultant” <a href="http://www.studmedlib.ru/ru/book/ISBN9785970425152.html">http://www.studmedlib.ru/ru/book/ISBN9785970425152.html</a>
	Radiation Diagnosis: textbook.. V.2	Trufanov G. Ye., Asaturyan M.A., Zharinov G.M.	M.: GEOTAR-Media, 2009, 2010	197	1	“Student consultant” <a href="http://www.studmedlib.ru/ru/book/ISBN9785970415658.html">http://www.studmedlib.ru/ru/book/ISBN9785970415658.html</a>
	Radiation Diagnosis: textbook.	Trufanov G. Ye., Asaturyan M.A., Zharinov G.M.	M.: GEOTAR-Media, 2013			“Student consultant” <a href="http://www.studmedlib.ru/ru/book/ISBN9785970425145.html">http://www.studmedlib.ru/ru/book/ISBN9785970425145.html</a>
	Radiation diagnosis and therapy. General Radiation Diagnosis	С. К Терновой. и др.	M.: GEOTAR-Media, 2014			“Student consultant” <a href="http://www.studmedlib.ru/book/ISBN9785970429891.html">http://www.studmedlib.ru/book/ISBN9785970429891.html</a>
	Radiology: Tutorial	Ed. A.Yu. Vasiliev	M.: GEOTAR-Media, 2008			“Student consultant” <a href="http://www.studmedlib.ru/book/ISBN9785970409251.html">http://www.studmedlib.ru/book/ISBN9785970409251.html</a>
	Radiodiagnosis in dentistry: Tutorial	Vasiliev A.Yu.,	M.: GEOTAR-			“Student consultant”

		Vorobiev Yu.I., Serova N.S.	Media, 2010			<a href="http://www.studmedlib.ru/book/ISBN9785970415955.html">http://www.studmedlib.ru/book/ISBN9785970415955.html</a>
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### Additional list

п/№	Title	Author(s)	Year and place of publication	Number of copies		Name in Electronic Student library
				in the library	at the department	
1	2	3	4	5	6	7
	Medical radiology and roentgenology (fundamentals of radiation diagnosis and radiation therapy): a textbook	Lindenbraten L.D.	M. : Medicine, 1993	278	1	
	A brief atlas on digital radiography: tutorial	Ed. A.Yu. Vasiliev	M.: GEOTAR-Media, 2008	7	1	
	Topographic anatomy and operative surgery: textbook. In 2 volumes.	Sergienko V. I., Petrosyan E. A, Frauchi IV	M.: GEOTAR-Media, 2010	V. 1– 147 V.2 - 148	-	
	Radiation mammology	Ternovoy S.K.	M.: GEOTAR-Media, 2007.	5		
	X-ray diagnosis of dental diseases: Textbook.	Vodolatsky M. P., Vodolatsky V. M., Samokhina N. V.	Stavropol : SGMA, 2006	1		
	Radiation diagnosis of liver diseases (MRT, CT, ultrasound, SPECT and PET)	Ed. G. E. Trufanov	M.: GEOTAR-Media, 2007. -	2		
	Radiation diagnosis of diseases of the urinary system, liver and biliary tract and the reproductive system of women: tutorial for students of medical, pediatric, and dental faculties	Olisaeva E.T. Georgiady S.G. Koraeva I.H. Sozaonty Z.R.	Vladikavkaz, 2010	10		
	Radiation diagnosis of diseases of the	Olisaeva E.T.	Vladikavkaz,	10		

pancreas and spleen, spinal cord and brain: method. tutorial for students of medical, pediatric, and dental faculties	Georgiady S.G. Koraeva I.H. Sozaonty Z.R.	2010			
Radiation diagnosis of lung diseases: method. recommendations for students of medical, pediatric, medical prophylactic, and dental faculties	Ed. Olisaeva E.T.	Vladikavkaz, 2011	8		
Radiation diagnosis of the heart and blood vessels	Olisaeva E.T. Georgiady S.G. Koraeva I.H. Sozaonty Z.R.	Vladikavkaz, 2011	8		
Radiation diagnosis of diseases of the esophagus, stomach, intestines: Tutorial	Olisaeva E.T. Georgiady S.G. Koraeva I.H. Sozaonty Z.R.	Vladikavkaz, 2009	18		
The physical basis of radiation diagnosis and radiation therapy: Tutorial for students of SOGMA ("North-Ossetian State Medical Academy")	Olisaeva E.T. Georgiady S.G. Koraeva I.H. Sozaonty Z.R.	Vladikavkaz, 2008	10		
Analysis of the data of radiation methods of research based on the principles of evidence-based medicine	Vasiliev A.Yu., Maly A.Yu., Serov N.S.	M.: GEOTAR- Media, 2008			"Student consultant" <a href="http://www.studmedlib.ru/book/ISBN9785970408698.htm">http://www.studmedlib.ru/book/ISBN9785970408698.htm</a>
Radiation diagnostics: tutorial	Ilyasova EB, Chekhonatskaya ML, Priezzheva VN	M.: GEOTAR- Media, 2013			"Student consultant" <a href="http://www.studmedlib.ru/book/ISBN9785970427200.html">http://www.studmedlib.ru/book/ISBN9785970427200.html</a>
Human Radial Anatomy Atlas	Filimonov VI, Shilkin VV, Stepankov AA, Churakov O.Yu.	M.: GEOTAR- Media, 2010			"Student consultant" <a href="http://www.studmedlib.ru/book/ISBN9785970413616.html">http://www.studmedlib.ru/book/ISBN9785970413616.html</a>
Magnetic resonance imaging: a guide for doctors	Ed. G. E. Trufanov	StPsb. Foliant, 2007	1		
Magnetic resonance imaging: Tutorial	Ed. S.K.	M.: GEOTAR-			"Student consultant"

		Ternovoy	Media, 2008			<a href="http://www.studmedlib.ru/book/ISBN9785970408353.html">http://www.studmedlib.ru/book/ISBN9785970408353.html</a>
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## **9. The list of resources of the information and telecommunication network "Internet", necessary for mastering the discipline**

### **1. Information and legal system "Garant"**

### **2. Information and legal system "Consultant"**

### **3. Information and legal system "Gosreestr LC"**

### **4. - "Student consultant" .**

Radiation Diagnosis: [Electronic resource] / Trufanov G. Ye., Asaturyan M.A., Zharinov G.M. - M.: GEOTAR-Media, 2013. - <http://www.studmedlib.ru/book/ISBN9785970425145.html>

Radiation Diagnosis. In two volumes. V. 1 [Electronic resource] / Akiev RM, Ataev AG, Bagnenko SS and others. Ed. G.E. Trufanov.- M.: GEOTAR-Media, 2011. - <http://www.studmedlib.ru/book/ISBN9785970419274.html>

Radiodiagnosis in dentistry: [Electronic resource] Tutorial / Vasiliev A.Yu., Vorobiev Yu.I., Serova N.S and others. - second edition, supplemented and revised. - M.: GEOTAR-Media, 2010. - <http://www.studmedlib.ru/book/ISBN9785970415955.html>

Radiation Diagnosis and therapy. General Radiation diagnosis [Electronic resource] / Ternovoy S.K. and others. - M.: GEOTAR-Media, 2014. - <http://www.studmedlib.ru/book/ISBN9785970429891.html>

### **5. - Proceedings of radiology and radiology**

<http://www.russianradiology.ru/jour>

### **6. - Russian Electronic Journal of Radiation Diagnostics**

<http://www.rejr.ru/perviy-nomer/vol-6-3-2016.html>

### **7. National School of Roentgenology**

<http://www.radiology-school.ru>

## **10. Methodical instructions for mastering the discipline**

The curriculum of classroom activities (72 hours) includes a lecture course (12 hours) and practical classes (36), and also independent work (24 hours). The main academic time is allocated to practical work on the study of X-ray organ anatomy, methods of radiation diagnosis, X-raying symptoms and differential diagnosis of various diseases. When studying the discipline, it is necessary to use the recommended literature both basic and additional and master practical skills in radiation diagnosis of pathological processes.

Practical classes are conducted in the form of answers to tests, oral questioning, analysis and description of radiographs, being in the X-ray room during X-ray examination of patients, and solution of situational tasks. In accordance with the requirements of Federal State Educational Standard in higher education, active and interactive forms of conducting classes (video films, situational tasks, independent out-of-class work) are widely used in the educational process. The portion of sessions conducted in the interactive forms constitutes at least 5% of classroom activities.

Independent work of students implies setting grounds for the formation of a systematic approach to the analysis of medical information, including the study of additional literature, work with medical documentation, writing x-ray protocols. Work with educational literature is viewed as a kind of educational work on the discipline of radiation diagnosis and is performed within the hours allocated for its study (in the SIW section).

Each student is provided with access to the library funds of the academy and the department.

During the study of the discipline, students independently compile protocols describing the images of different organs and are being present during radiation examination in the cabinets.

The work of the student in the group forms a sense of teamwork and sociability.

### 11. List of information technologies used in the implementation of the educational process of the discipline

Semester	Type of activity L, CPC, S.	educational technologies used (active, interactive)	Number of hours	% of interactive sessions	List of Software
5	Л	presentations, videos on the topics of the lecture	12		Microsoft Office PowerPoint; Internet Explorer
5	ПЗ	A set of questions and tasks for a practical task, a set of situational tasks for the AP, set of roentgenograms	36	5	Microsoft Office
5	С	Questions and tasks for independent work	24		Microsoft Office Internet Explorer

### 12. Description of the material and technical base necessary for implementing the educational process of the discipline

№/	Name of Equipment	Quantity	Technical state
1.	2	3	4
<b>Special equipment</b>			
1.	educational classes (19.1 sq. m, 22.7 sq. m, 13.6 sq. m)	3	good
2.	doctor's lounge (18 square meters)	1	satisfactory
3.	lecture hall (141.8 sq.m)	1	good
4.	computers	3	satisfactory



5.	laptop	1	good
6.	multimedia complex (laptop, projector, screen)	1	good
7.	negatoscope	10	satisfactory
8.	slidescope	1	satisfactory
9.	set of roentgenograms, CT and MRT	370	good
10.	radiographic description protocols	90	good
11.	video movies		good
12.	situational tasks		good
13.	tests		good
14.	laminated tables	200	good
15.	X-ray diagnostic equipment	4	good
16.	Apparatus for radiotherapy	3	good
Phantoms			
17.	- 1. -		
Mock-ups			
18.	-		