MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS
Educational Institution
«BELARUSIAN STATE MEDICAL UNIVERSITY»

Контрольный экземпляр

APPROVED
by Rector of the Educational Institution «Belarusian State Medical University»
_____ S.P.Rubnikovich
26.06.2025
Reg. # UD-0911-03-20/2526/edu.

RADIODIAGNOSIS AND RADIOTHERAPY

Curriculum of the educational institution in the academic discipline for the specialty

7-07-0911-03 «Dentistry»

2025

Curriculum is based on the educational program «Radiodiagnosis and Radiotherapy», approved 26.06.2025, registration # УД-0911-03-20/2526/уч; on the educational plan in the specialty 7-07-0911-03 «Dentistry», approved 16.04.2025, registration # 7-07-0911-03/2526/mf.

COMPILERS:

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RECOMMENDED FOR APPROVAL:

by the Department of Radiation Diagnostics and Radiation Therapy of the educational institution «Belarusian State Medical University»
(protocol # 27 of 05.05.2025);

by the Scientific and Methodological Council of the educational institution «Belarusian State Medical University»
(protocol # 10 of 26.06.2025)

EXPLANATORY NOTE

«Radiodiagnosis and Radiotherapy» – the academic discipline of the module «General Clinical Therapy Module # 1», which contains systematized scientific knowledge about the methods of radiodiagnosis and radiation therapy used in medicine.

The aim of the discipline «Radiodiagnosis and Radiotherapy» is the formation of extended professional competency for the purpose of timely detection and treatment of diseases of the maxillofacial region.

The objectives of the discipline «Radiodiagnosis and Radiotherapy» are to form students' scientific knowledge about:

radiation symptoms and syndromes of pathological processes of the maxillofacial region;

algorithm for the use of radiation studies in the detection of pathological processes of the maxillofacial region;

basic principles and methods of radiotherapy of benign and malignant neoplasms of the maxillofacial region;

skills and abilities necessary for:

definition of the method of radiation diagnosis, projection and area of examination;

interpretation of the results of the method of radiation diagnosis;

formulation of conclusions based on the results of the method of radiation diagnosis.

Relations to other educational disciplines

The knowledge, skills and abilities acquired during the study of the academic discipline «Radiodiagnosis and Radiotherapy» are necessary for successful mastering of the educational disciplines «Internal Medicine», «Pediatrics», modules: «General Clinical Surgical Module», «Therapeutic Dentistry», «Periodontology», «Prosthodontics», «Pediatric Dentistry», «Oral and Maxillofacial Surgery».

Studying the educational discipline «Radiodiagnosis and Radiotherapy» should ensure the formation of students' extended professional competency: examine patients’ condition applying radiation diagnostic methods, identify the main radiation symptoms and syndromes of human diseases applying the combined radiation imaging techniques and radiation therapy.

As a result of studying the discipline «Radiodiagnosis and Radiotherapy» the student should

know:

types and properties of ionizing radiation;

the basic concepts (principles) of protection against exposure to ionizing radiation;

physico-technical bases of radiodiagnosis and radiation therapy;

diagnostic capabilities of radiation imaging methods;

symptoms and syndromes of pathological processes in the maxillofacial region identified using various methods of radiation diagnosis;

rules of medical ethic and deontology;

be able to:

determine indications and contraindications for radiological research methods;

identify the method of radiological research methods, projection and area of examination;

interpret the results of the method of radiation diagnosis;

master:

the skills of registration of the protocol of research;

the skills of formulating a conclusion based on data obtained as a result of radiation research methods.

Total number of hours for the study of the discipline is 108 academic hours, of which 63 classroom hours and 45 hours of student independent work. Classroom hours according to the types of studies: lectures – 12 hours (including 3 hours of supervised student independent work (SSIW)), practical classes –51 hours.

Intermediate assessment is carried out according to the syllabus of the specialty in the form of a credit (6^{th} semester).

Form of higher education – full-time.

ALLOCATION OF ACADEMIC TIME ACCORDING TO SEMESTERS OF STUDY

Code, name of the specialty	Semester	Total number of academic hours	Number of classroom hours				Out-of-class self-studies	Form of intermediate assessment
			Number of classroom hours	including				
				class lectures	SSIW	practicals		
7-07-0911-03 «Dentistry»	5	57	36	6	3	27	21	-
	6	51	27	3	-	24	24	credit
Total hours		**108**	**63**	**9**	**3**	**51**	**45**	

THEMATIC PLAN

Section (topic) name	Number of class hours	
	lectures (incl. SSIW)	practical
1. Radiation Diagnostics	**12**	**48**
1.1. Physical and biological bases of radiodiagnosis and radiation therapy	–	3
1.2. Radiation diagnostic methods	–	3
1.3. X-ray and cone-beam computed tomography	–	3
1.4. Magnetic resonance imaging	–	3
1.5. Ultrasound diagnostics	–	3
1.6. Radiation diagnostics of the musculoskeletal system	–	3
1.7. Radiation diagnostics of the respiratory system and mediastinum	–	3
1.8. Radiation diagnostics of the digestive system	–	3
1.9. Radiation methods for studying the maxillofacial region. Radiation anatomy of teeth and jaws	1,5	3
1.10. Radiation diagnostics of traumatic injuries to the maxillofacial region	1,5	3
1.11. Radiodiagnostics of inflammatory processes of the maxillofacial system	3	6
1.12. Radiation diagnostics of cysts and neoplasms of the maxillofacial region	3	6
1.13. Radiation diagnostics of diseases of the salivary glands and temporomandibular joint	3	6
2. Radiation Therapy	–	**3**
Total hours	**12**	**51**

CONTENT OF THE EDUCATIONAL DISCIPLINE

1. Radiation Diagnostics

1.1. Physical and biological foundations of radiodiagnostics and radiation therapy

The history of the development of radiation diagnostics. The place of radiation diagnostics and radiation therapy in the complex of medical knowledge and its connection with other sciences.

Classification of radiation, its nature and properties. Radiation sources used in medicine. Fundamentals and principles of dosimetry. The concept of doses. Units of measurement of dose, dose rate and radioactivity. Organization and tasks of dosimetric control. Principles of protection and labor protection measures in the diagnostic use of radiation.Radiation safety. Stationary and non-stationary protective devices. Maximum permissible doses and categories of examined patients. «Critical» organs and radiation loads during radiation studies.

Medical ethics and deontology in radiation diagnostics.

1.2. Radiation diagnostic methods

Classification of methods of X-ray diagnostics. Basic and special methods of X-ray examination (radiography, fluoroscopy, digital radiography, linear tomography, etc.) and their characteristics. X-ray tube: structure and operating principle. Basic types of X-ray diagnostic units. Structure and equipment of an X-ray room. The principle of obtaining an X-ray image. Methodology for analyzing X-ray images.

Methods of artificial contrast (angiography, bronchography, lymphography, pneumomediastinum, cholegraphy, cholecystography, phlebography, excretory urography, etc.). Types of contrast agents. Routes of administration of contrast agents. Reactions and complications after administration of contrast agents. Emergency medical care for adverse reactions to contrast agents.

Spatial research methods (linear tomography, panoramic tomography, X-ray computed tomography, cone beam computed tomography).

Radionuclide research methods. Radiopharmaceuticals (RP). Requirements for RP. RP for in vivo studies: methods of production, characteristics of the most important preparations, choice of preparation. Reagents used for in vitro research. Routes of administration of RP into the body.

Fundamentals and principles of radionuclide diagnostics. In vitro and in vivo studies. Indications and contraindications for radionuclide studies. Selection of a study depending on the objectives (assessment of the structural or functional state). In vivo diagnostic methods. In vivo research methods: radiometry (remote, contact), radiography. Scintigraphy: static, dynamic. Principle of evaluation of organ function and morphology in radionuclide research. Radionuclide research in vitro by competitive analysis.

Radiodiagnostic equipment (radiodiagnostic instrument detectors, electronic unit, output control device). Radiometers. Gamma cameras. Single-photon emission computed tomography – obtaining a tomographic section by computer reconstruction of the image obtained by rotating the detector (gamma camera). Resolution capabilities of positron emission tomography, single-photon emission computed tomography. Indications for positron emission tomography.

1.3. X-ray and cone-beam computed tomography

Physical principles of X-ray computed tomography (XCT) and cone beam computed tomography (CBCT). Types of X-ray computed tomographs. Principle of obtaining images. Hounsfield scale. Hounsfield units. Visualization window. Post-processing of images. Image archiving. Software, a set of options and tools for CBCT. Indications and contraindications for XCT and CBCT. Contrast, types of contrast agents, their dosage and methods of administration. Research protocols. Image interpretation. Dose loads and radiation protection for XCT and CBCT.

1.4. Magnetic resonance imaging

Physical principles of magnetic resonance imaging (MRI). Phenomenon of nuclear magnetic resonance. Larmor frequency. Precession. Radiofrequency pulse. Relaxation. Principle of obtaining images. Magnetic characteristics of tissue: T1 relaxation, T2 relaxation, spin density. Basic pulse sequences: spin echo, inversion

recovery, gradient echo, fast sequences. Gradient concept. Layer selection. Phase and frequency encoding of the signal. Fundamentals of MR anatomy. Identification of anatomical objects based on MRI results (various pulse sequences). Image quality: layer thickness, layer orientation, spatial and contrast resolution. Selection of examination parameters: TR, TE, T1, number of signal averaging, vector tilt angle, field of view, matrix size, number of slices, layer thickness and distance between them, scanning time and factors affecting it. Special software packages. Types of magnetic resonance tomographs. Determination of indications and contraindications for MRI. Contrast in MRI, types of contrast agents, their dosage and methods of administration. Special techniques: dynamic MRI, MR angiography, MR sialography, MR urography, MR cholangiopancreatography, etc. Using MRI in diagnosing diseases. Research protocols. Image interpretation. Safety measures for patients and medical workers in the MRI room.

1.5. Ultrasound diagnostics

Physical principles of ultrasound examinations. Frequency of ultrasonic vibrations, period and wavelength. Characteristics of ultrasonic waves, their properties (penetration, reflection, absorption, scattering). Piezoelectric effect. Principle of obtaining images. Resolution of ultrasonic sensors, their types. Possibilities of ultrasound methods in studying the morphology and function of human organs. Indications for ultrasound examination. Basic terms used in ultrasound examination: echo-negative formation, echo-positive formation, acoustic shadow. Ultrasound anatomy of internal organs. Research protocols. Interpretation of the results of ultrasound examination of the salivary glands.

1.6. Radiation diagnostics of the musculoskeletal system

Growth and development of the skeleton, age periods. Age and functional anatomy of the skeleton. Age-related features of bones and joints. Methods of radiation examination of the musculoskeletal system (radiography, tomography, direct magnification of X-ray images, fistulography, arthrography, CT, MRI, radionuclide diagnostics, etc.). Determination of indications and contraindications for radiation examination methods in traumatic injuries, inflammatory diseases of bones and joints (osteomyelitis, tuberculosis of bones and joints), benign and malignant bone neoplasms.

X-ray diagnostics of traumatic injuries of bones and joints, especially in childhood and old age. Healing of bone fractures in X-ray image, healing disorders (excessive bone callus, delayed consolidation, formation of pseudoarthrosis). Complications of injuries of the skeletal system. Localization of foreign bodies in bones, joints, soft tissues. Gunshot injuries to bones, joints, soft tissues. Interpretation of the results of radiological diagnostics of traumatic injuries to bones and joints.

X-ray semiotics of musculoskeletal diseases: changes in bone shape, bone size, bone structure, X-ray joint space. X-ray symptoms of inflammatory diseases of the skeleton: osteomyelitis, tuberculosis of bones and joints. X-ray symptoms of benign and primary malignant bone neoplasms. X-ray symptoms of secondary malignant bone lesions. Interpretation of the results of radiological diagnostics of inflammatory diseases of bones and joints, benign and primary malignant bone neoplasms.

1.7. Radiation diagnostics of the respiratory system and mediastinum

Radiation methods for examining the chest organs, indications for examination. X-ray anatomy of the chest organs. Lobar, segmental and subsegmental structure of the lungs X-ray symptoms and syndromes of lung diseases. Extensive and limited shadow (radiolucency) of the pulmonary field, focal, round and ring-shaped shadow, pulmonary dissemination, pathological changes in the root and pulmonary pattern, impaired bronchial obstruction. Foreign bodies of the bronchi. Acute pneumonia. Lung abscess. X-ray diagnostics of pulmonary tuberculosis. Pleurisy. Benign neoplasms of the lungs. Malignant primary and secondary (metastatic) neoplasms of the lungs, pleura. Space-occupying lesions in the mediastinum. Radiation diagnostics of postoperative complications. Radiation diagnostics of traumatic injuries of the chest organs. Interpretation of the results of radiation diagnostics of emergency conditions in traumatic injuries and diseases of the chest organs.

1.8. Radiation diagnostics of the digestive system

Radiation methods for examining the digestive system organs. Determination of indications and contraindications for radiation methods for examining the gastrointestinal tract organs.

Methods of contrasting the esophagus. X-ray anatomy of the esophagus the norm. X-ray diagnostics of foreign bodies in the esophagus. The main X-ray signs of congenital and acquired pathological changes in the esophagus (varicose veins, diverticulum, burn, achalasia, benign and malignant.

X-ray anatomy of the stomach and duodenum in the norm. X-ray signs of dysfunction of the stomach and duodenum. X-ray signs of diseases of the stomach and duodenum (peptic ulcer and its complications, duodenitis, polyps and polyposis, benign and malignant neoplasms). X-ray diagnostics of gastric ulcer complications: perforation, penetration, malignancy, stenosis of the gastric outlet, cicatricial deformations, bleeding.

X-ray anatomy and physiology of the small and large intestines. Mechanical and dynamic obstruction of the small intestine. X-ray picture of acute intestinal obstruction. X-ray signs of diseases of the small and large intestines (enteritis, diverticulitis, colitis, benign and malignant neoplasms, infectious colitis, ulcerative colitis, polyposis).

Interpretation of the results of radiation diagnostics of emergency conditions in diseases of the abdominal organs.

1.9. Radiation methods for studying the maxillofacial region. Radiation anatomy of teeth and jaws

Radiation methods for examining the maxillofacial region. X-ray methods for examining teeth and jaws (interview images, orthopantomography, panoramic radiography, linear tomography, maxillary radiography, fistulography, sialography). Features of the methodology and technique of X-ray examination of teeth and jaws (interview radiography, extraoral and intraoral radiography of teeth and jaws, teleradiography). Rules of isometry. Rules of orthoradiality. Arrangements used in dentistry. Indications for conducting radiation research methods. Selection of a radiation diagnostic method according to clinical protocols.

Radiation anatomy of the maxillofacial region in adults and children. Radiographic signs of developmental abnormalities of teeth and jaws, types of congenital and acquired anomalies of the maxillofacial region.

Algorithm for describing the results of radiological studies of the maxillofacial region.

CBCT in dentistry, indications and contraindications. Determination of bone density using the Hounsfield scale. Post-processing of XCT, CBCT images. Selection of virtual implants in the CBCT implant module. Determination of reversible and irreversible radiographic signs of destruction of alveolar bone tissue. Calculation of 3D volume of bone tissue defect. Airway analysis based on CBCT data.

Definition of basic, special and additional methods of X-ray examination of teeth and jaws. Definition of anatomical objects on orthopantomogram, teleroentgenogram and based on CBCT results. Definition of structural elements of the temporomandibular joint based on the results of zonography in lateral projection and CBCT, MRI.

1.10. Radiation diagnostics of traumatic injuries to maxillofacial region

Radiation methods of examination in maxillofacial injuries. Radiation diagnostics of fractures, fracture healing. Main radiographic signs of fractures, presence of a fracture line, displacement of bone fragments, deformation of the bone as a whole, discontinuity of the cortex contour. Line of «enlightenment» and line of «darkening». Direction of the fracture line: straight, oblique, Y-shaped, T-shaped. The position of the fracture plane is transverse, oblique, longitudinal. Fragment displacements: angular, lateral, longitudinal, peripheral displacements. Fractures of the upper and lower jaw along the «lines of weakness». Fractures according to Le Fort-1, Le Fort-2, Le Fort-3. Fractures occurring simultaneously in two, three or more places. Radiation diagnostics of temporomandibular joint dislocations.

Determination of indications and contraindications for radiation methods of examination in case of traumatic injuries of the maxillofacial region, interpretation of results. Preparation of the research protocol; formulation of the conclusion based on the data obtained as a result of the research.

1.11. Radiodiagnostics of inflammatory processes of the maxillofacial system

Radiation methods of examination in inflammatory diseases of the maxillofacial region. Radiodiagnostics of inflammatory processes of the maxillofacial system. Radiodiagnostics of caries (shape and contours of carious cavities, marginal carious cavities). Targeted intraoral digital dental radiography using the «bite-wing» method. The objectives of radiographic examination for caries. Radiographic diagnostics of pulp diseases. Radiographic diagnostics of periodontitis (acute apical periodontitis, chronic granulating periodontitis, chronic granulomatous periodontitis, chronic fibrous periodontitis, periodontitis in children). Radiological diagnostics of inflammatory diseases of the jaws (post-traumatic and hematogenous osteomyelitis, actinomycosis, tuberculosis, syphilis, etc.). Determination of indications and contraindications for radiological examination in inflammatory processes of the dental and maxillary region. Interpretation of the results of radiological examinations in caries, pulpitis, periodontitis, periodontal atrophy, sinusitis, osteomyelitis,

suppuration of radicular cysts. Preparation of the research protocol; formulation of the conclusion based on the data obtained as a result of the research.

1.12. Radiation diagnostics of cysts and neoplasms of the maxillofacial region

Radiation methods of examination of cysts and neoplasms of the maxillofacial region. Radiological diagnostics of odontogenic and non-odontogenic cysts of the maxillofacial region. Differential diagnostics of various types of cysts (follicular cyst, radicular cyst, retention cyst, keratocyst, nasopalatine canal cyst, residual cyst).

Radiological diagnostics and differential diagnostics of benign odontogenic neoplasms (odontoma, cementoma, ameloblastoma) and non-odontogenic neoplasms (osteoma, osteochondroma, chondroma, osteoblastoclastoma, hemangioma), malignant neoplasms of non-odontogenic origin (chondrosarcoma, osteogenic sarcoma, fibrosarcoma, etc.). Radiation diagnostics of metastases and myeloma disease. Staging of malignant process based on data obtained using modern methods of radiation diagnostics.

Determination of indications and contraindications for radiological examination of cysts and neoplasms of the maxillofacial region. Interpretation of radiographic findings in keratocyst, follicular cyst, lateral periodontal cyst, radicular cyst, non-odontogenic fissure cysts, odontoma, ameloblastoma, cementoma, myxoma, odontogenic fibroma, osteoclastoma, osteoma, hemangioma, cancer, osteosarcoma, chondrosarcoma, reticulosarcoma, Ewing's sarcoma, metastatic lesions of the jaws. Preparation of the research protocol; formulation of the conclusion based on the data obtained as a result of the research.

1.13. Radiation diagnostics of diseases of the salivary glands and temporomandibular joint

Radiation methods of examination of salivary glands. Radiation anatomy and physiology of salivary glands. Radiation diagnostics of salivary gland diseases: salivary stone disease, inflammatory diseases - acute and chronic sialoadenitis, damage to the salivary glands in collagenoses (Sjogren's syndrome, Mikulicz disease), benign and malignant neoplasms of the salivary glands.

Radiation methods of temporomandibular joint examination. Radiation anatomy of the temporomandibular joint using various methods of radiation diagnostics (orthopatomography, zonography, CBCT, MRI). Radiation diagnostics of temporomandibular joint diseases. Joint dysfunction syndrome. Degenerative-dystrophic changes in the joint. Inflammatory changes in the temporomandibular joints. Bone and fibrous ankylosis.

Determination of indications and contraindications for radiological examination of diseases of the salivary glands and temporomandibular joint, interpretation of results; preparation of the research protocol; formulation of the conclusion based on the data obtained as a result of the research.

2. Radiation Therapy

Physico-biological principles of radiation therapy. Radiosensitivity of normal and malignant cells. Classification of malignant neoplasms according to the WHO TNM International Classification System. Effect of ionizing radiation on neoplasms. Physical and chemical means of radiomodification. Determination of indications and

contraindications for radiation therapy. The goal of radical, palliative and symptomatic treatment.

Classification of radiation therapy methods. Principles of radiation therapy for oncological and non-oncological diseases. Clinical and dosimetric planning of radiation therapy. Clinical topometry. Selection of treatment type and determination of therapeutic methods of exposure (complexes). Selection of radiation exposure parameters: irradiation mode and method, focal and total absorbed dose, irradiation rhythm. Complications of radiation therapy: radiation reactions and radiation injuries. Drawing up a radiation therapy plan for malignant neoplasms. Indications for radiation therapy for non-oncological diseases.

EDUCATIONAL DISCIPLINE CURRICULAR CHART

Section, topic #	Section (topic) name	Number of class hours		SSIW	Literature	Practical skills	Form of control	
		lectures	practical				of practical skills	of current / intermediate assessment
	5 semester							
	Lectures	**6**	**-**	**3**				
1.9.	Radiation methods for examining the maxillofacial region. Radiation anatomy of teeth and jaws	1,5	-	-	1, 2, 3	-	-	-
1.10.	Radiation diagnostics of traumatic injuries to the maxillofacial region	1,5	-	-	1, 2, 3	-	-	-
1.11.	Radiodiagnostics of inflammatory processes of the maxillofacial system	1,5	-	1,5	1, 2, 3	-	-	Testing
1.13.	Radiation diagnostics of diseases of the salivary glands and temporomandibular joint	1,5	-	1,5	1, 2, 3	-	-	Testing
	Practical lessons	**-**	**27**	**-**				
1.1.	Physical and biological bases of radiation diagnostics and radiation therapy	-	3	-	1, 2, 3	-	-	Interview
1.2.	Radiation diagnostic methods	-	3	-	1, 2, 3	-	-	Interview
1.3.	X-ray and cone-beam computed tomography	-	3	-	1, 2, 3	1. Determination of bone density using the Hounsfield scale. 2. Post-processing of X-	Solution of situational problems	Interview

						ray computed tomography and cone beam computed tomography images. 3. Selection of virtual implants in the implant module of cone beam computed tomography		
1.4.	Magnetic resonance imaging	-	3	-	1, 2, 3	-	-	Defense of an abstract (report), interview
1.5.	Ultrasound diagnostics	-	3	-	1, 2, 3	Compliance with the rules for processing tools and equipment	Visual assessment of practical skills performance	Defense of an abstract (report), interview
1.6.	Radiation diagnostics of the musculoskeletal system	-	3	-	1, 2, 3	Interpretation of the results of radiation diagnostics of traumatic injuries and inflammatory diseases of bones and joints, benign and primary malignant neoplasms of bones	Preparation of the research protocol. Formulation of the conclusion *	Interview
1.7.	Radiation diagnostics of the respiratory system and mediastinum	-	3	-	1, 2, 3	Interpretation of the results of radiation diagnostics of emergency conditions in traumatic injuries and diseases of the chest organs	Preparation of the research protocol. Formulation of the conclusion	Interview

1.8.	Radiation diagnostics of the digestive system	-	3	-	1, 2, 3	Interpretation of the results of radiation diagnostics of emergency conditions in diseases of the abdominal organs	Preparation of the research protocol. Formulation of the conclusion	Interview
1.9.	Radiation methods for examining the maxillofacial region. Radiation anatomy of teeth and jaws	-	3	-	1, 2, 3	Definition of basic, special and additional methods of X-ray examination of teeth and jaws. Determination of anatomical objects on orthopantomogram, zonography, teleroentgenogram and according to the results of cone-beam computed tomography	Solution of situational problems*	Interview; testing
	6 semester							
	Lectures	**3**	**-**	**-**				
1.12.	Radiation diagnostics of cysts of the maxillofacial region	1,5	-	-	1, 2, 3	-	-	-
1.12.	Radiation diagnostics of neoplasms of the maxillofacial region	1,5	-	-	1, 2, 3	-	-	-
	Practical classes	-	**24**	-				
1.10.	Radiation diagnostics of traumatic injuries to the maxillofacial region	-	3	-	1, 2, 3	Interpretation of the results of radiological examination of traumatic injuries of the maxillofacial region	Preparation of the research protocol. Formulation of the conclusion	Interview; testing

1.11.	Radiation diagnostics of inflammatory processes of the dental system (caries, pulpitis, periodontitis, periodontal atrophy, sinusitis)	-	3	-	1, 2, 3	Interpretation of the results of radiological studies in caries, pulpitis, periodontitis, periodontal atrophy, sinusitis	Preparation of the research protocol. Formulation of the conclusion	Interview
1.11.	Radiation diagnostics of inflammatory processes of the dental system (osteomyelitis, actinomycosis, tuberculosis, etc.)	-	3	-	1, 2, 3	Interpretation of the results of radiological studies in osteomyelitis, suppuration of radicular cysts	Preparation of the research protocol. Formulation of the conclusion	Interview; testing
1.12.	Radiation diagnostics of cysts of the maxillofacial region	-	3	-	1, 2, 3	Interpretation of radiographic findings in keratocyst, follicular cyst, lateral periodontal cyst, radicular cyst, non-odontogenic fissure cysts	Preparation of the research protocol. Formulation of the conclusion *	Interview; testing
1.12.	Radiation diagnostics of neoplasms of the maxillofacial region	-	3	-	1, 2, 3	Interpretation of radiographic findings in odontoma, ameloblastoma, cementoma, myxoma, odontogenic fibroma, osteoclastoma, osteoma, hemangioma, cancer, osteosarcoma, chondrosarcoma, reticulosarcoma, Ewing's sarcoma, metastatic lesions of the jaws	Preparation of the research protocol. Formulation of the conclusion*	Interview; testing

1.13.	Radiation diagnostics of diseases of the salivary glands	-	3	-	1, 2, 3	Interpretation of the results of radiological examination methods in diseases of the salivary glands	Preparation of the research protocol. Formulation of the conclusion	Interview; testing
1.13.	Radiation diagnostics of diseases of the temporomandibular joint	-	3	-	1, 2, 3	Interpretation of the results of radiological examination methods in diseases of the temporomandibular joint	Preparation of the research protocol. Formulation of the conclusion	Interview; testing
2.	Radiation Therapy	-	3	-	1, 2, 3	Preparation of medical documentation	Filling out a patient's medical record	Credit
	Total hours	**9**	**51**	**3**				

*This is a mandatory form of current certification

INFORMATION AND INSTRUCTIONAL UNIT

LITERATURE

Basic (relevant):

1. Diagnostic radiology : textbook / G. E. Trufanov, R. M. Akiev, K. N. Alekseev [et al.]; ed. G. E. Trufanov. – Moscow : GEOTAR-Media, 2021. – 444 p.

2. Ovchinnikov, V. A. Radiology and radiotherapy: textbook for students of the faculty of foreign students with English as the language of instruction / V. A. Ovchinnikov – Minsk : New knowledge, 2020. – 504 p.

Electronic courseware for the educational discipline «Radiodiagnosis and Radiotherapy»

3. https://etest.bsmu.by/course/view.php?id=953.

METHODOLOGICAL RECOMMENDATIONS FOR THE ORGANIZATION AND PERFORMANCE OF STUDENT INDEPENDENT WORK IN THE ACADEMIC DISCIPLINE

The time allocated for independent work can be used by students for:
preparing for lectures, practical classes;
preparing for credit in the academic discipline;
studying the topics (issues) designed for independent work;
performing research and creative tasks;
preparing thematic reports, abstracts, presentations;
taking notes of educational literature;
compiling a review of scientific literature on a given topic;
compilation of a thematic selection of literature sources, Internet sources.

METHODOLOGICAL RECOMMENDATIONS FOR THE ORGANIZATION AND PERFORMANCE OF SUPERVISED STUDENT INDEPENDENT WORK IN THE ACADEMIC DISCIPLINE

APPROXIMATE LIST OF TASKS FOR SUPERVISED STUDENT INDEPENDENT WORK:

preparation of thematic reports, abstracts, presentations;

taking notes of original sources (collections of documents, monographs, textbooks);

preparation of tests for the organization of mutual control;

design of information and demonstration materials (stands, posters, graphs, tables, newspapers, etc.).

FORMS OF CONTROL OF SUPERVISED STUDENT INDEPENDENT WORK:

electronic testing.

LIST OF AVAILABLE DIAGNOSTIC TOOLS

The following forms of current certification are used to diagnose competencies:
interview;
testing;
defense of an abstract (report);
solving situational problems.

LIST OF AVAILABLE TEACHING METHODS

Traditional method;
active (interactive) methods:
Problem-Based Learning (PBL);
Team-Based Learning (TBL);
Case-Based Learning (CBL);
Research-Based Learning (RBL).

LIST OF PRACTICAL SKILLS

Name of practical skills	Form of practical skills control
1. Definition of basic, special and additional methods of X-ray examination of teeth and jaws	Solution of situational problems
2. Determination of anatomical objects on orthopantomogram, zonography, teleroentgenogram and according to the results of cone-beam computed tomography	Solution of situational problems
3. Interpretation of the results of radiation diagnostics of traumatic injuries and inflammatory diseases of bones and joints, benign and primary malignant neoplasms of bones	Preparation of the research protocol. Formulation of the conclusion
4. Interpretation of the results of radiation diagnostics of emergency conditions in traumatic injuries and diseases of the chest organs	Preparation of the research protocol. Formulation of the conclusion
5. Interpretation of the results of radiation diagnostics of emergency conditions in diseases of the abdominal organs	Preparation of the research protocol. Formulation of the conclusion
6. Interpretation of the results of radiological examination of traumatic injuries of the maxillofacial region	Preparation of the research protocol. Formulation of the conclusion
7. Interpretation of the results of radiological studies in caries, pulpitis, periodontitis, periodontal atrophy, sinusitis, osteomyelitis, suppuration of radicular cysts	Preparation of the research protocol. Formulation of the conclusion
8. Interpretation of radiographic findings in keratocyst, follicular cyst, lateral periodontal cyst, radicular cyst, non-odontogenic fissure cysts, odontoma, ameloblastoma, cementoma, myxoma, odontogenic fibroma, osteoclastoma, osteoma, hemangioma, cancer, osteosarcoma, chondrosarcoma, reticulosarcoma, Ewing's sarcoma, metastatic lesions of the jaws	Preparation of the research protocol. Formulation of the conclusion

Name of practical skills	Form of practical skills control
9. Interpretation of the results of radiological examination methods in diseases of the salivary glands and temporomandibular joint	Preparation of the research protocol. Formulation of the conclusion
10. Determination of bone density using the Hounsfield scale	Solution of situational problems
11. Post-processing of X-ray computed tomography and cone beam computed tomography images	Solution of situational problems
12. Selection of virtual implants in the implant module of cone beam computed tomography	Solution of situational problems
13. Compliance with the rules for processing tools and equipment	Visual assessment of practical skills performance
14. Preparation of medical documentation	Filling out a patient's medical record

PROTOCOL OF THE CURRICULUM APPROVAL BY OTHER DEPARTMENTS

Title of the discipline requiring approval	Department	Amendments to the curriculum in the academic discipline	Decision of the department, which designed the curriculum (date, protocol #)
Internal Medicine	Department of Internal Medicine, Gastroenterology and Nutrition with a course for advanced training and retraining	Agreed. No offers	05.05.2025, protocol #27
Pediatrics	Department of 1st Childhood Diseases	Agreed. No offers	05.05.2025, protocol #27
Surgical diseases	Department of surgical diseases with a course of advanced training and retraining	Agreed. No offers	05.05.2025, protocol #27
Ophthalmology	Department of Eye Diseases	Agreed. No offers	05.05.2025, protocol #27
Traumatology and Orthopedics	Department of Traumatology and Orthopedics with a course for advanced training and retraining	Agreed. No offers	05.05.2025, protocol #27
Obstetrics and Gynecology	Department of Obstetrics and Gynecology with a course for advanced training and retraining	Agreed. No offers	05.05.2025, protocol #27
Otorhinolaryngology	Department of Otorhinolaryngology with a course for advanced training and retraining	Agreed. No offers	05.05.2025, protocol #27
Conservative Dentistry	Department of Conservative Dentistry	Agreed. No offers	05.05.2025, protocol #27
Endodontics	Department of Endodontics	Agreed. No offers	05.05.2025, protocol #27
Oral Mucology	Department of Conservative Dentistry	Agreed. No offers	05.05.2025, protocol #27
Clinical Periodontology	Department of Periodontology	Agreed. No offers	05.05.2025, protocol #27
Complex Periodontology	Department of Periodontology	Agreed. No offers	05.05.2025, protocol #27
Fixed prosthetics	Department of Prosthetic Dentistry and Orthodontics	Agreed. No offers	05.05.2025, protocol #27
Removable Prosthetics	Department of Prosthetic Dentistry and Orthodontics	Agreed. No offers	05.05.2025, protocol #27

Maxillofacial orthopedics and orthopedic dentistry	Department of Prosthetic Dentistry and Orthodontics	Agreed. No offers	05.05.2025, protocol #27
Children's Therapeutic Dentistry	Department of Pediatric Dentistry	Agreed. No offers	05.05.2025, protocol #27
Children's Maxillofacial Surgery	Department of Maxillofacial Surgery and Facial Plastic Surgery with a course of advanced training and retraining	Agreed. No offers	05.05.2025, protocol #27
Surgical Dentistry and Propaedeutics of Surgical Diseases of the Maxillofacial Region	Department of Oral Surgery	Agreed. No offers	05.05.2025, protocol #27
Maxillofacial surgery and outpatient surgery of the maxillofacial region	Department of Maxillofacial Surgery and Facial Plastic Surgery with a course of advanced training and retraining	Agreed. No offers	05.05.2025, protocol #27

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Curriculum content, composition and the accompanying documents comply with the established requirements.

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24.06.2025

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