Federal State Autonomic Educational Institution of Higher Education
«Peoples' Friendship University of Russia»

Medical Institute

WORKING PROGRAMM

Course name

Radiodiagnosis

Recommended for the direction of training (specialty)

31.05.03 Dentistry

Program (profile, specialization)

Dentistry

1. Aim and objectives of discipline:

Aim: To provide the training for the specialty "Dentistry", profile « Radiodiagnosis»

Objectives: To provide theoretical and practical training for doctors in the specialty of dentistry in modern diagnostic radiology and radiation therapy.

2. Place of discipline in the structure of OP HE:

The discipline Diagnostic radiology in dentistry refers to the basic part of Block 1 of the curriculum.

Table №1 given preceding and following discipline aimed at forming competence discipline in accordance with the matrix competences OP HE.

Table 1.

Preceding and following the discipline aimed at creating competencies

	Code and title of competence	Precceding disciplines	Following discipline
General Professional Competences			
1	GPC-5.	Physics, Therapy	
2	GPC-9.	Physics, Therapy	
Professional Competences			
3	PC-1.		

3. Requirements to results of development of discipline:

The process of discipline is aimed at formation of the following competences:

Table No. 2

Formed competencies

Competencies	Competency name	Competence achievement indicators
GPC-5.	Being able to examine patients to determine a diagnosis when solving professional tasks	GPC-5.2. Formulating a preliminary diagnosis and drawing up a plan for laboratory and instrumental examinations of a dental patient.
GPC-9.	Being able to assess morpho-functional, physiological conditions and pathological processes in the human body to solve professional tasks	GPC-9.2. Evaluating the results of clinical, laboratory and functional diagnosis in dealing with professional tasks.
PC-1.	Being able to make an examination of a patient in order to determine a diagnosis.	PC-1.5. Making a preliminary/final diagnosis based on the patient examination; laboratory and instrumental examinations.

As a result of studying the discipline, the student must:

To know:

- Types of radiation, their physical nature, methods based on different types of radiation.
- The properties of different types of radiation, the possibility of radiological methods in the evaluation of different organs, systems, tissues.
- To know a schematic arrangement of an x-ray machine, the principles of production of x-rays to have an idea of braking and characteristic radiation.

- For example, properties of x-ray radiation to understand the principles of obtaining images in x-ray diagnostics.
- To know what projection studies, position studies. To know the construction of the x-ray image, patterns of purpose required projections and positions, their performance.
- Basic principles of x-ray, ultrasound, radionuclide methods of diagnosis, CT and magnetic resonance scans, the main methods of the study, the diagnostic value of each method of the study, indications for each method of radiation diagnosis, the advantages and negative points.
- Rules for constructing x-ray images for each method and wheretobuy intraoral radiography, the indications and the diagnostic value of each method
- Radiological signs characteristic of the formation and development of dentoalveolar apparatus, anomalies of teeth and jaws; the types of congenital anomalies (deformities) of oral-facial area, the main clinical and radiological signs, and dental caries, pulpitis, periodontitis, periodontal disease, diseases of the salivary glands, traumatic injuries of the maxillofacial region.
- Criteria of malignancy of the tumor, obtained according to various types of radiation diagnosis.
- All types and schemes of radiation therapy used in modern Oncology practice and in particular in the treatment of tumors of the maxillofacial region.
- Physical basis of ultrasonic method of research, basic methods of ultrasonic diagnostics, the scope of their application.
- The definition of a method of radionuclide diagnostics, General principles for radionuclide studies the physical and chemical aspects of this type of research, the most common methods of radionuclide diagnostics, to know the scope and indications. Get acquainted with modern methods of radionuclide diagnostics.
- Principles of methods of x-ray computer and magnetic resonance imaging, physical fundamentals of computer and magnetic resonance imaging, the indications and contraindications
- according to the radiological method of research to determine the timeliness of the formation of the rudiments and eruption of the teeth, in the process of development of the dentognathic apparatus.
- radiological signs characteristic of the formation and development of the dentoalveolar upper and lower jaws in the process of aging.
- To diagnose deformations of the maxillofacial region, to differentiate
- Radiographic signs of developmental abnormalities of the teeth and jaws; the types of congenital anomalies (deformities) oral and maxillofacial region.
- Conduct x-ray diagnostics of inflammatory and dystrophic diseases of the maxillofacial region.
- The main radiographic signs of caries, pulpitis, periodontitis, periodontal disease.
- To get acquainted with radiographic signs of caries. To get acquainted with radiographic signs of pulpitis. To get acquainted with radiographic signs of periodontitis. To meet radiological signs in case of parodentium diseases.
- To know classification of caries (according to localization, stage, clinic). Know the algorithm for conducting x-ray studies of dental caries
- To know radiological features to determine the depth of the process depending on the size and localization of carious defeat of teeth. The approach in the differential diagnosis of caries in radiography. To know classification of pulpitis. Know the algorithm for conducting x-ray studies of dental caries
- To know x-ray picture of the pulpit. To know the methods of x-ray diagnostics, classification of periodontitis (acute apical, chronic granulating, chronic fibrous, chronic in the acute stage). Know the algorithm of conducting x-ray studies with periodontitis.

- To know the radiological features to determine the depth of the process depending on the size and localization of periodontitis. An approach is presented in the differential diagnosis of periodontitis during x-ray examination
- To know the classification of periodontal diseases (gingivitis, periodontitis, periodontal disease), its prevalence (local and diffuse); Know the methods of x-ray diagnostics and the algorithm for conducting periodontal diseases. Know the features of the x-ray picture with gingivitis, periodontitis, periodontosis.
- Conduct X-ray diagnosis of traumatic changes in the jaw and teeth.
- The main radiological signs of various types of fractures and dislocations, evaluate the correctness of the comparison of fragments. Know the radiological features of the diagnosis of fracture of the upper and lower jaw.
- Classification of jaw cysts (odontogenic and non-odontogenic genesis), WHO statistics on the prevalence of each type of jaw cysts. Classification of benign tumors (odontoma, ameloblostoma, cementoma, myxoma, odontogenic fibroma, osteoclastoma), WHO statistics on the prevalence of each type of benign tumors. Features localization, pathogenesis, growth, and X-ray picture of benign tumors and jaw cysts.
- The diagnostic value of each method of instrumental diagnostics and the general algorithm of x-ray studies.
- to diagnose malignant diseases of the maxillofacial region.
- The main signs of malignancy of the tumor process, obtained according to various types of radiation diagnostics.
- to diagnose malignant diseases of the maxillofacial region.
- main clinical and radiological signs of salivary gland diseases. The diagnostic value of the contrast diagnostic method.
- The basic principles of surgical, chemoradiological treatment of benign and malignant neoplasms, types and sources of radiation used in radiation therapy and their characteristics. The main forms of drug treatment of malignant tumors.
- all types of radiation therapy used in modern cancer practice.
- determine the need for and methodology of radiation therapy for various tumors of the maxillofacial region.

Be able to:

- Determine the indications for radiation diagnosis.
- Correctly assign the necessary method of radiation diagnosis.
- Determine the area of study, the method used by the proposed x-ray.
- Conduct X-ray research methods, evaluate the correctness of the construction of X-ray images, own the basic X-ray research methods.
- Determine the indications and evaluate the results of ultrasonic, radionuclide research methods, as well as computed and magnetic resonance imaging.
- Perform x-rays of the maxillofacial region in accordance with the basic rules of intraoral and extraoral radiography;
- according to the X-ray method of research, to determine the timeliness of the formation of primordia and teething, in the process of development of the dentofacial apparatus, to diagnose deformations of the maxillofacial region, to differentiate congenital and acquired anomalies of the maxillofacial region;
- carry out x-ray diagnosis of various diseases of the salivary glands;
- carry out x-ray diagnosis of inflammatory and dystrophic diseases of the maxillofacial region;
- conduct radiological diagnosis of traumatic changes in the jaw and teeth;
- be able to identify radiological signs, as well as differential diagnostic criteria for benign and malignant tumors of the maxillofacial region, as well as jaw cysts.

- Based on the results of all diagnostic measures, choose the most appropriate method of radiation therapy.

To possess:

- Basic principles of x-ray, ultrasound, radionuclide methods of diagnosis, CT and magnetic resonance imaging, the main methods of radiological diagnosis.
- Information on the diagnostic value and indications for each method of radiation diagnosis, the advantages and disadvantages.
- Rules of construction of x-ray images for each method and wheretobuy intraoral radiography, knowledge of the indications and diagnostic value of each method.
- Knowledge of the radiological signs characteristic of the formation and development of the dentognathic apparatus development anomalies of teeth and jaws; the types of congenital anomalies (deformities) oral and maxillofacial region, basic clinical and radiological characteristics, as well as caries, pulpitis, periodontitis, parodontosis, diseases of the salivary glands, traumatic injuries of the maxillofacial region.
- Criteria of malignancy of the tumor, obtained according to various types of radiation diagnosis.
- All types and schemes of radiation therapy used in modern Oncology practice and in the treatment of tumors of the maxillofacial region in particular.
- Physical properties of ultrasonic waves, the source and receiver of ultrasonic waves, principles of modern ULTRASOUND machines, the main methods of this type of radiation diagnosis (one-dimensional sonography and ULTRASOUND scanning, Doppler), and the scope of each of them.
- Evaluation of results of ultrasonic methods of research and know the diagnostic value of information obtained.
- General principles for radionuclide studies the physical and chemical aspects of this type of research, the most common methods of radionuclide diagnostics,
- rules of construction x-ray images for each method and wheretobuy intraoral radiography, the indications and the diagnostic value of each method.
- Detailed knowledge of the anatomy of the upper jaw, features her image on the x-rays in different periods of growth, the formation of the maxillary sinus, x-ray picture depending on the child's age, radiographic techniques applied to produce images of the upper jaw.
- x-ray picture of different types of anomalies of teeth.
- radiographic signs of caries, pulpitis, when the disease periodontal.
- Information on the radiological characteristics of various types of fractures and dislocations, to evaluate the correctness of the mapping of bone fragments, radiological features diagnosis of fracture of the upper and lower jaws, radiographic characteristics of odontogenic cysts and neoantigenic.
- The diagnosis of malignant diseases of the maxillofacial region; to know the basic signs of malignancy of the tumor, obtained according to various types of radiation diagnosis; know the major clinical and rentgenologicheski signs of diseases of the salivary glands.
- Main methods of radiodiagnostics of diseases of the salivary glands and know the basic radiological signs.
- The basic principles of surgical, chemotherapeutic treatment of benign and malignant tumors, types and sources of radiation used in radiation therapy and their characteristics.
- Types of radiation therapy used in modern Oncology practice.
- Basic principles of radiation therapy used in the treatment of tumors of the maxillofacial region.

4. Volume of discipline and types of study

General credit value of the discipline is 3 credit units.

Type of study load	Total hours	Semesters			
		5			
Class hours (total)	51	151			
Include:	-	-	-	-	-
Lectures					
Practical training (PT)	51	51			
Seminars (S)					
Laboratory research (LR)					
Of these, in interactive form:	6	6			
Independent work (total)	57	57			
Including:	-	-	-	-	-
Course project					
Settlement and graphic works					
Abstract					
Other types of independent work	57	57			
Work with patients in the department, the study of case histories, participation in the diagnosis of supervised patients					
Type of intermediate certification (test, exam)					
Total labor input hours	108	108			
Credit Unit	3	3			

5. Content of the discipline

5.1. The content of the discipline sections

PROGRAM CONTENT

Lesson 1 (4 hours)

X-RAY DIAGNOSTIC METHOD

Objectives of the study: to get acquainted with the x-ray method of research.

Learning Content:

Students are introduced to the physical fundamentals of image acquisition during X-ray studies, methods of radiological diagnostics (radiography, electro-radiography, fluoroscopy, television fluoroscopy, fluorography, digital radiography), the indications and contraindications to the use of a particular technique, the negative and positive aspects of each of them, are considered, modern methods of digital processing of information received, assessment of the results of x-ray studies.

Lesson 2 (3 hours)

ULTRASONIC DIAGNOSTIC METHOD

To be able to: to estimate results of ultrasound studies.

Know: Physical basis of ultrasonic method of research, basic methods of ultrasonic diagnostics, the scope of their application.

Learning objectives: to familiarize with ultrasonic methods of diagnostics

Learning content: Introduction to the physical characteristics of ultrasonic waves source and receiver of ultrasonic waves, principles of modern ULTRASOUND machines, the main methods of this type of radiation diagnosis (one-dimensional sonography and ULTRASOUND scanning,

Doppler), and the scope of each of them, Own evaluation of the results of ultrasonic methods of research and know the diagnostic value of information obtained.

Lesson 3 (4 hours)
RADIONUCLIDE DIAGNOSTICS

Learning objectives

Be able to: Assess the results of radionuclide research methods, determine the indications and contraindications for this diagnostic method

Know:

Definition of the method of radionuclide diagnostics, general principles of conducting radionuclide studies, physical and chemical aspects of this type of research, the most common methods of radionuclide diagnostics, know the scope and indications. Get familiar with modern methods of radionuclide diagnostics.

Learning content: To familiarize students with the principles of the radionuclide research method, with the scheme of a typical radionuclide diagnostic system, with the classification of all radionuclide diagnostic studies, the principles of the selection of radiopharmaceuticals, depending on the nuclear physical and pharmacodynamic properties, the classification of the radiopharmaceutical depending on the effective half-life.

Each method of radionuclide diagnostics, the principles of its implementation, positive and negative sides, indications for implementation on clinical examples, assessment of the results of a radionuclide study are considered. The methods are studied in more detail: scintigraphy, positron emission tomography.

Lesson 4 (4 hours)
X-RAY COMPUTED AND MAGNETIC RESONANCE TOMOGRAPHY

To be able: to determine the indications and evaluate the results of computer and magnetic resonance tomography.

To know: Principles methods of computer-aided x-ray and magnetic resonance imaging, physical fundamentals of computer and magnetic resonance imaging, the indications and contraindications

Purpose of study: to explore the method of computer x-ray tomography. To get acquainted with the method of magnetic resonance imaging

Learning content: to Familiarize students with the definition of a method x-ray computer tomography, the scheme of obtaining a computer tomograms. Discusses the distinctive features of computed tomography from x-ray tomography, scope, indications and contraindications to this method of research, training, indications to perform the examination with application of contrast.

The wording of the definition of the method of magnetic resonance imaging, familiarization with the basic components of a magnetic resonance tomograph, a brief introduction to the physical aspects of image acquisition, applications, indications and benefits of this methodology (especially the lack of radiation exposure, a better image of the soft tissues) to other diagnostic methods (radiography, computer tomography), and contraindications (presence of metallic foreign bodies in the tissues).

Lesson 5 (3 hours)
X-RAY DIAGNOSTIC METHODS OF THE MAXILLOFACIAL AREA

To be able to: perform x-rays of the maxillofacial region in accordance with the basic rules of intraoral and extraoral radiography techniques.

Know:

The rules for constructing x-ray images for each method of intraoral and extraoral radiography, indications and diagnostic value of each method.

The purpose of the study: to study all methods of intraoral, extraoral radiography.

Learning content: the classification of intraoral radiography (intraoral according to the isometric projection rule, interproximal, occlusal and intraoral radiography from a large focal length) is considered, the particularities of implementation and the rules for obtaining images with each technique. The position of the patient in the chair, the tilt of the head relative to the floor plane, the

films used are shown, the indications and diagnostic value of each of the intraoral methods of radiography are studied.

All methods of extraoral radiography are considered, classification including overview radiographs, extraoral radiographs in oblique contact and tangential projections, a circle of indications for each individual extraoral radiography technique is outlined, the diagnostic value of each technique is studied, the rules for taking pictures are studied: the position of the cartridge relative to the part being examined, the direction of the x-ray tube .

Indications and goals of a layered study of the maxillofacial region (tomography) are determined, the advantages and disadvantages of orthopantomography are considered.

Lesson 6 (3 hours)

DEVELOPMENT AND ANATOMY OF TEETH AND JAWS IN THE X-RAY IMAGE

To be able to: according to the X-ray method of research, determine the timeliness of the formation of primordia and teething, in the process of development of the dentition.

Know:

radiological signs characteristic of the formation and development of the maxillary and maxillary apparatus in the process of age-related changes.

The purpose of the study: to get acquainted with the x-ray picture of the early and late stages of tooth development. To get acquainted with the radiological picture of the upper jaw at different periods of life. To get acquainted with the radiological picture of the lower jaw at different periods of life.

Learning Content: To study three periods of growth and formation of teeth, their corresponding age limits and radiological characteristics of each period (degree of mineralization, stage of root formation). The causes of teething delay, and methods for their diagnosis, are also considered.

Students are reminded of the detailed anatomy of the upper jaw, the features of its image on radiographs at different periods of growth, the time of formation of the maxillary sinus, the radiological picture depending on the age of the child, the radiological techniques used to obtain images of the upper jaw.

The anatomy of the lower jaw, the features of its image on radiographs at different periods of growth, the x-ray picture depending on age are considered.

Lesson 7 (3 hours)

DIAGNOSIS OF CONGENITAL AND ACQUIRED DEFORMITIES OF THE MAXILLOFACIAL REGION

To be able: to Diagnose deformations of the maxillofacial region, to differentiate

Facts: Radiographic signs of abnormalities of the teeth and jaws; the types of congenital anomalies (deformities) oral and maxillofacial region.

Learning objectives: to get acquainted with the x-ray picture of different types of anomalies of teeth. To learn radiological signs of congenital and acquired anomalies of the jaws.

Contents of training: various options are anomalies of development and position of the teeth, which consists in modifying the number, size, shape and structure of the teeth. Studied x-ray pattern and differential diagnostic features in each kind of malformations of teeth, evaluated the diagnostic value of radiological techniques.Know the types and clinical picture of congenital and acquired anomalies of the jaws (different types of dysostosis syndrome hemifacial microsomia, Goldenhar syndrome, post-traumatic deformation, deformation caused by osteomyelitis), recognize radiological signs characteristic for each species of anomalies.

Lesson 8 (3 hours)

RADIOLOGICAL DIAGNOSIS OF CARIES, PULPITIS, PERIODONTITIS, PERIODONTAL DISEASE

To be able to:

Conduct x-ray diagnostics of inflammatory and dystrophic diseases of the maxillofacial region.

To know:

The main radiographic signs of caries, pulpitis, periodontitis, periodontal disease.

- The aim of the study: to get Acquainted with radiographic signs of caries. To get acquainted with radiographic signs of pulpitis. To get acquainted with radiographic signs of periodontitis. To meet radiological signs in case of parodentium diseases.
The content of training. To know classification of caries (according to localization, stage, clinic). Know the algorithm for conducting x-ray studies of dental caries
Know radiological features to determine the depth of the process depending on the size and localization of carious defeat of teeth. The approach in the differential diagnosis of caries in radiography. To know classification of pulpitis. Know the algorithm for conducting x-ray studies of dental caries
Know x-ray picture of the pulpit.
To know methods of radiological diagnosis, classification of periodontitis (acute apical, chronic granulomatous, chronic fibro, chronic in the acute stage). Know the algorithm for conducting x-ray studies in periodontitis.
Know radiological features to determine the depth of the process depending on the size and localization of periodontitis. The approach in differential diagnosis of periodontitis by x-ray
To know the classification of periodontal diseases (gingivitis, periodontitis, periodontal disease), its prevalence (both local and diffuse) to Know methods of radiological diagnostics and algorithm of actions in case of periodontium diseases. To know the characteristics of x-ray pictures with gingivitis, periodontitis, parodontosis.

Lesson 9. (3 hours)
RADIATION DIAGNOSTICS OF TRAUMATIC INJURIES OF THE MAXILLA, MANDIBLE AND TEETH

Be able to:
Conduct X-ray diagnosis of traumatic changes in the jaw and teeth.
Know:
The main radiological signs of various types of fractures and dislocations, evaluate the correctness of the comparison of fragments. Know the radiological features of the diagnosis of fracture of the maxilla and mandible.
The purpose of the study: To get acquainted with the radiological signs of fractures and dislocations, depending on the mechanism of action. Know the algorithm of x-ray studies depending on the location of traumatic injuries. Know WHO statistics on the incidence of maxillary and mandibular fractures. Know the radiological features of MRI and CT of post-traumatic changes depending on localization. (mandible, bones of the middle zone of the face)
Learning Content. The classification of the main and indirect radiological signs characteristic of fractures of the maxilla mandible, zygomatic bone is considered. An approach to x-ray examination with various diagnostic methods in patients with traumatic changes in the maxillofacial region is presented. Various methods of x-ray studies are studied for fractures and dislocations (orthopantomography, MRI, CT). The main and indirect radiological signs of dislocations and their combination with fractures of the maxilla and mandible were determined.

Lesson 10. (3 hours)
RADIATED DIAGNOSTICS OF BENIGN TUMORS AND CYSTS OF JAW

Learning objectives
Be able to:
Inspect the oral cavity, mucosa and be able to identify radiological signs of benign tumors and jaw cysts.
Know:
Classification of jaw cysts (odontogenic and non-odontogenic genesis), WHO statistics on the prevalence of each type of jaw cysts. Classification of benign tumors (odontoma, ameloblostoma, cementoma, myxoma, odontogenic fibroma, osteoclastoma), WHO statistics on the prevalence of each type of benign tumors. Features localization, pathogenesis, growth, and X-ray picture of benign tumors and jaw cysts.

The diagnostic value of each method of instrumental diagnostics and the general algorithm of x-ray studies.

- The purpose of the study: To get acquainted with the radiological signs of odontogenic and non-odontogenic cysts. Know the features of localization, pathogenesis, growth, and features of the x-ray picture of the jaw cysts. Get acquainted with the radiological signs of benign tumors. Know the features of localization, pathogenesis, growth, and X-ray picture of benign tumors

Learning Content. The main groups of odontogenic and non-odontogenic cysts are considered, their radiological signs allowing differential diagnostics between different types of odontogenic and non-odontogenic cysts. To know the types of X-ray research methods with different localization of cysts of odontogenic and non-odontogenic genesis.

The main groups of benign tumors are considered: odontomas, ameloblostomas, cementomas, myxomas, odontogenic fibroma, osteoclastomas, their x-ray picture, signs that allow differential diagnosis between different types of benign tumors. To know the types of X-ray research methods for different locations of benign tumors, the general algorithm of X-ray studies.

Lesson 11 (3 hours)

RADIATION DIAGNOSIS OF MALIGNANT TUMORS OF THE JAW

To be able to: diagnose malignant diseases of the maxillofacial region.

Know: the main signs of malignancy of the tumor process, obtained according to various types of radiation diagnostics.

Objectives of the study: to diagnose malignant tumors of the jaw using the entire spectrum of modern radiation diagnostic methods.

Learning content: the main groups of malignant tumors of the jaw are examined, depending on their histological structure (cancer, sarcoma) and localization, all methods of radiation diagnostics used to detect tumors of the maxillofacial region, indications and diagnostic value for each of the methods are determined, familiarization with the features assessment of the results of the study, differential diagnostic criteria of malignant tumors are studied, as well as staging of the process based on data obtained from and use of modern methods of radial diagnostics.

Lesson 12 (3hours)

RADIATION DIAGNOSTICS OF DISEASES OF THE SALIVARY GLANDS. CONTRAST X-RAY METHOD

To be able to: Perform radiological diagnosis of various diseases of the salivary glands.

Know: the main clinical and radiological signs of diseases of the salivary glands. The diagnostic value of the contrast diagnostic method.

Objectives of the study: to get acquainted with the basic methods of radiation diagnosis of diseases of the salivary glands and the main radiological signs. Get acquainted with the contrast method of x-ray examination, in particular with sialography

Learning content: the anatomical features of the structure of the parotid, submandibular, sublingual salivary glands, the classification of salivary gland diseases depending on the etiology and pathogenesis are examined, the characteristic differential diagnostic radiological signs of various types of salivary gland diseases are studied.

The features of performing the contrast method of x-ray diagnostics, the contrasts, indications and contraindications for this type of diagnosis, the diagnostic value of sialography in diseases of the salivary glands are considered.

Lesson 13 (3 hours)

PRINCIPLES OF RADIATION ONCOLOGY

To be able: Based on the diagnostic data, it is correct to choose the methodology for the treatment of tumors of the maxillofacial region.

Know: The basic principles of surgical, chemoradiotherapy treatment of benign and malignant neoplasms, types and sources of radiation used in radiation therapy and their characteristics. The main forms of drug treatment of malignant tumors.

Objective: To get acquainted with the main groups of drugs used in the treatment of malignant tumors. Get acquainted with modern methods of radiation therapy of neoplasms.

Learning Content. The main groups of chemotherapy drugs, their properties, methods of administration and combination, as well as specific pathological conditions for the use of each of the drugs are considered. Complications of chemotherapy. The results of the use of chemotherapy with various localization of tumors. The use of vaccines, enzymes, hormones in oncology. Indications and contraindications for chemotherapy.

Students get acquainted with various types of radiation and their characteristics: x-ray, gamma radiation, beta radiation, inhibitory cure, protons and electrons in radiation therapy.

The methods of radiation therapy are considered (radical, palliative radiation therapy, preoperative and postoperative, remote, interstitial, intracavitary, contact, intravenous, single-field and multi-field, small-fraction and large-fraction). As well as the pathological processes in which they are used. Complications of radiation therapy and methods for their prevention and treatment.

Lesson 14 (3 hours)

BASIC METHODS OF RADIATION THERAPY

To be able to: based on the results of all diagnostic measures, choose the most appropriate method of radiation therapy.

Know: all types of radiation therapy used in modern cancer practice.

The objectives of the study: to be able to choose an adequate regimen, dose and methodology of radiation therapy.

Learning content: Students are introduced to the main biological effects caused by ionizing radiation in tissues, various types of radiation, the main types of radiation therapy (remote and contact), and radiation therapy regimens (radical, palliative, symptomatic) are considered. Indications for radiation therapy, complications (systemic, local) and contraindications for radiation therapy are determined.

Lesson 15 (3 hours)

FUNDAMENTALS OF RADIOTHERAPY OF TUMORS OF THE ORGANO-FACIAL REGION

To be able to: determine the need for and methodology of radiation therapy for various tumors of the maxillofacial region.

Know: the basic principles of radiation therapy used in the treatment of tumors of the maxillofacial region.

Objectives of the study: To get acquainted with the basic methods of radiation therapy used in the treatment of malignant tumors of the maxillofacial region.

Learning content: various options for radiation therapy are considered and indications for their use in the treatment of malignant tumors of the maxillofacial region, the possibility of combining radiation therapy with other types of special treatment, contraindications for radiation therapy, diagnosis and treatment of local and systemic complications of radiation therapy.

5.2. Sections of disciplines and types of classes

№	Name of the section of discipline	*L*	*PC*	*LR*	*S*	Ssgw	Total hours
1.	X-RAY DIAGNOSTIC METHOD		4				4
2.	ULTRASONIC DIAGNOSTIC METHOD		3		1	4	7
3.	RADIONUCLIDE DIAGNOSTICS		4			4	8
4.	X-RAY COMPUTED AND MAGNETIC RESONANCE TOMOGRAPHY		4			4	8

5.	X-RAY DIAGNOSTIC METHODS OF THE MAXILLOFACIAL AREA		3		1	5	8
6.	DEVELOPMENT AND ANATOMY OF TEETH AND JAWS IN THE X-RAY IMAGE		3			4	7
7.	DIAGNOSIS OF CONGENITAL AND ACQUIRED DEFORMITIES OF THE MAXILLOFACIAL REGION		3		1	6	9
8.	RADIOLOGICAL DIAGNOSIS OF CARIES, PULPITIS, PERIODONTITIS, PERIODONTAL DISEASE		3			4	7
9.	RADIATION DIAGNOSTICS OF TRAUMATIC INJURIES OF THE MAXILLA, MANDIBLE AND TEETH		3			4	7
10.	RADIATED DIAGNOSTICS OF BENIGN TUMORS AND CYSTS OF JAW		3		1	4	7
11.	RADIATION DIAGNOSIS OF MALIGNANT TUMORS OF THE JAW		3			3	7
12.	RADIATION DIAGNOSTICS OF DISEASES OF THE SALIVARY GLANDS. CONTRAST X-RAY METHOD		3			3	7
13.	PRINCIPLES OF RADIATION ONCOLOGY		3			4	7
14.	BASIC METHODS OF RADIATION THERAPY		3		1	4	7
15	FUNDAMENTALS OF RADIOTHERAPY OF TUMORS OF THE ORGANO-FACIAL REGION		3		1	4	7
16	TEST		3				3
	TOTAL		51		6	57	108

5.3. Description of interactive classes

№	№ discipline section	Subject of a practical training (seminars)	Type of occupation	Workload (hours)
1.	**2**	**Dopplerography**	ws	**1**
2.	**5**	**MRI**	ws	**1**
3.	**7**	**Orthography**	ws	**1**
4.	**10**	**CT scan**	ws	**1**
5.	**14**	**Bremsstrahlung (braking radiation)**	ws	**1**
6.	**15**	**Topography**	ws	**1**

8. Educational and methodological support of the discipline.

1. Trofimova T.N. Grapach I.A., Belchikova N.S. Radiation diagnostics in dentistry // 2010 - 6 - 186.
2. Radiation diagnostics. Textbook, Moscow, GOETAR-MEDIA, 2009 Ilyasova et al.
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4. Kolesov A.A. Neoplasms of the facial skeleton. - M .: Medicine. 1962. - 188 p.
5. Levova N. D. The value of the anatomical structure of the salivary glands in salivary stone disease // Dentistry. - 1974.- N 1 p. 25-28.

6. Pinus RB Odontogenic cysts of the maxillary sinus. Sverdlovsk: Wed Url Prince Publishing House 1968 - 180 p.
7. Rabukhina N. A., Arzhantsev A. P. // Radiodiagnosis in dentistry. - 1999
8. Rubakhina N. A. Panina N. S., Dedeyan S. A. The role of x-ray examination for dental caries // Dentistry. - 1986. - N 2. - p. 27-31
9.Solntsev A.M., Kolesov V.S. Cysts of the maxillofacial region and neck. - Kiev, 1982. - 96 p.
10. Ilyasova E.B., Chekhonatskaya M.L. Priezzheva V.N. Radiation diagnostics // study guide - 2009.42-107 p.

VISUAL AIDS

1. Sets of radiographs by topic.
2. Sets of ultrasound tomograms by topic.
3. Sets of computed tomograms for the private diagnosis of diseases.
4. Sets of magnetic resonance imaging for the diagnosis of particular diseases.
5. Examination questions in radiology.

9. Material and technical support of the discipline.

X-ray rooms: bone system radiography, angiography.
Radioisotope diagnostics: osteoscintigraphy.
Endoscopic laboratory: laryngo-bronchoscopy.
Spiral computed tomography.
Magnetic resonance imaging.
Laboratory of Ultrasound Diagnostics: ultrasound imaging of soft tissues.
Dopplerography.
Laboratory of Pathomorphology: Cytology, Histology. Electron microscopy.
A computer complex for teaching students and conducting test control.
Surgical operating rooms.
Radiation therapy laboratory: X-ray therapy, gamma therapy, radiation at particle accelerators, intracavitary therapy laboratory.
Two laboratories for practical training.
Lecture hall.
Slides, videos, posters, tables, drawings.

10. Information support of the discipline.

a) software
-presentations of lectures and laboratory exercises in all sections of the discipline;
-test tasks for training and knowledge control;
b) databases, reference and search engines.

11. Guidelines for students on the development of the discipline (module).

Students are required to attend classes, complete teacher assignments, familiarize themselves with recommended literature, etc. When assessing a student, the quality of the work in the classroom, the level of preparation for independent activities in the chosen field, the quality of the teacher's assignments, and the ability to independently study the teaching material are assessed.

At practical classes in the classrooms, the relevant topics are analyzed using multimedia technology (computer, projector).

Independent work in extracurricular hours can take place both in the classrooms of the department and the computer classroom, where students can study the material on presentations prepared by the department teachers, as well as on computer tests.

Extracurricular independent work includes: study of the material on the textbook, textbooks on paper and electronic media; preparation of abstract messages on the chosen topic; preparation for the performance of tests and tests.

12. Fund of estimated means for the interim assessment of students in the discipline (module).

Table 1. - Point-rating system for the discipline Diagnostic radiology and radiation therapy.

	Rating	**Unsat**		**Satis**		**Good**	**Exell**	
	ECTS score	F	FX	E	D	C	B	A
	Traditional rating	2	2+	3	3+	4	5	5+
Credit	The sum of points (the complexity of the student)	0-30	31-50	51-60	61-68	69-85	86-94	95-100

Competencies are formed during the entire cycle of teaching medical practice and discipline Diagnostic radiology and radiation therapy. Assessed by the teacher as the ability in the course of practical and independent studies to analyze theoretical and clinical data in various types of future professional activities. Competency assessment is carried out on a scale from **Table 2.**

Table 2. - Modular teaching system for the discipline Diagnostic radiology and radiation therapy, specialty Dentistry.

Module №	**Name of module**	**Unsat**	**Satis**	**Good**	**Exell**
1	X-RAY DIAGNOSTIC METHOD **3 hours (0,075 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
2	ULTRASONIC DIAGNOSTIC METHOD **3 hours (0,15 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
3	RADIONUCLIDE DIAGNOSTICS **3 hours (0,075 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
4	X-RAY COMPUTED AND MAGNETIC RESONANCE TOMOGRAPHY **3 hours (0,15 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
5	X-RAY DIAGNOSTIC METHODS OF THE MAXILLOFACIAL AREA **6 hours (0,15 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
6	DEVELOPMENT AND ANATOMY OF TEETH AND JAWS IN THE X-RAY IMAGE **3 hours (0,15 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
7	DIAGNOSIS OF CONGENITAL AND ACQUIRED DEFORMITIES OF THE MAXILLOFACIAL REGION **3 hours (0,15 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
8	RADIOLOGICAL DIAGNOSIS OF CARIES, PULPITIS, PERIODONTITIS, PERIODONTAL DISEASE **3 hours (0,15 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
9	RADIATION DIAGNOSTICS OF TRAUMATIC INJURIES OF THE MAXILLA, MANDIBLE AND TEETH	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score

	3 hours (0,15 credit)				
10	RADIATED DIAGNOSTICS OF BENIGN TUMORS AND CYSTS OF JAW **3 hours (0,15 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
11	RADIATION DIAGNOSIS OF MALIGNANT TUMORS OF THE JAW **3 hours (0,075 credit)**	< 3,3 score	3,3 - 4,4 score	4,4 - 5,5 score	5,5 - 6,5 score
12	**TOTAL 3 hours (0,075 credit)**				

Radiology Test Questions

1. Select the basic properties of x-rays?
A) Penetration
B) Ionizing property
C) Photochemical property
D) Magnetic property

2. What is x-ray tomography?
A) A layered study of the object in the form of a longitudinal section
B) Layer-by-layer examination of an object in the form of a cross section
C) Layer-by-layer examination of an object in the form of a longitudinal section and a transverse section

3. What is bronchography?
A) The method of artificial contrasting of the bronchi
B) Computer study of the bronchi
C) Contrast examination of the vessels of the bronchi

4. What is angiography?
A) a study of the liver
B) The study of blood vessels by contrast
C) The study of the lymphatic system

5. What is magnetic resonance angiography?
A) Visualization of blood vessels without the introduction of contrast medium
B) Layer-by-layer tissue examination
C) Study of the phase of blood flow in the brain

6. What is ultrasound dopplerography?
A) Study of the structure of organs
B) Study of blood flow in the arteries and veins of the maxillofacial region
C) Ultrasound examination of adipose tissue

7. What is a contrast x-ray study?
A) The introduction of a contrast agent for the differentiation of various organs and tissues
B) Layered organ examination

8. What is thermography?
A) A method for diagnosing diseases by recording thermal radiation
B) Radiography with heating of the investigated organ

9. What is electro-roentgenography?
A) Method for obtaining x-ray images on paper
B) The combination of electrical and x-ray radiation

Sample topics of control questions:

1. Types of rays used in diagnostics.
2. The device of the x-ray tube.
3. Beam topometry.
4. Film-based and filmless radiography.
5. X-ray examination of the teeth.
6. CT scan for diseases of the jaw and teeth.
7. MRI in the diagnosis of pathology of the maxillofacial region.
8. Contrast research methods in radiology.
9. Combined radioisotope and CT studies.

The program is compiled in accordance with the requirements of the FSES HE.

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