



ОҢТҮСТІК-ҚАЗАҚСТАН MEDISINA AKADEMIASY «Оңтүстік Қазақстан медицина академиясы» АҚ		SOUTH KAZAKHSTAN MEDICAL ACADEMY АО «Южно-Казахстанская медицинская академия»
Department of Phthisiopulmonology and Radiology		70/11
"Nuclear Medicine" (Syllabus)		

Syllabus

Department of Phthisiopulmonology and Radiology Curriculum for the discipline "Nuclear Medicine" (Syllabus) Educational program "7R01114 "Radiology"

1. General information about the discipline			
1.1	Discipline code: R-YaM	1.6	Academic year: 2025- 2026
1.2	Course Title:Nuclear Medicine	1.7	Well: 1
1.3	Prerequisites: radiology	1.8	Semester:
1.4	Postrequisites: ultrasound, CT, MRI, radiology in mammology, pediatric radiology, comprehensive radiation diagnostics of diseases of organs and systems	1.9	Loans (ECTS): 10
1.5	Cycle: PD	1.10	Component:OK
2. Description of the discipline			
Radiology is a branch of medicine that studies the use of radiation methods for the diagnosis (radiodiagnostics) and treatment (radiotherapy) of various diseases, as well as diseases and pathological conditions that arise from exposure to ionizing radiation on the human body.			
3. Summative assessment form			
3.1	Testing	3.5	Coursework
3.2	Writing	3.6	Essay
3.3	Oral	3.7	Project
3.4	OSPE/OSKE or practical skills assessment	3.8	Other (specify)
4. Goals of the discipline			
To train highly qualified radiologist who possesses a system of universal professional competencies, capable and prepared for independent professional work in primary health care.			
5. Final learning outcomes (LO of the discipline)			
PO1	is able to formulate a clinical diagnosis, prescribe a research plan and evaluate its effectiveness based on evidence-based practice at all levels of medical care		
PO6	able to learn independently and teach other members of the professional team, actively participate in discussions, conferences and other forms of continuous professional development		
5.1	LO disciplines	The purpose of teaching the cycle is to acquire and improve professional skills and new theoretical knowledge	
	LO1	LO1 is able to formulate a clinical diagnosis, prescribe a research plan and evaluate its effectiveness based on evidence-based practice at all levels of medical care	
	LO6	LO6 is able to learn independently and teach other members of the professional team, actively participate in discussions, conferences	

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	and other forms of continuous professional development					
6.	Detailed information about the discipline					
6.1	Venue (building, auditorium): Regional Clinical Hospital, Daumed Medical Center, Medicare Medical Center, City Diagnostic Center, DL-IVF Medical Center, Regional Oncology Center (X-ray, CT, MRI, ultrasound and mammography rooms)					
	Number of hours – 300	Practical. les.	SRRN	SRR		
		60	195	45		
7.	Information about teachers					
№	Full name	Degrees and position		Email		
1	Kasaeva Lazzat Tatibekovna	Candidate of Medical Sciences		L_Kasaeva@mail.ru		
2	Amralina Aisulu Akhmetovna	Candidate of Medical Sciences				
3	Seytova Alua Agytaevna	assistant		alua.1959@mail.ru		
4	Tulegenova Aigul Asanbaevna	assistant				
Information about clinical mentors						
1	Emeshev Erlan Amirbekovich	part-time worker		Radiology, CT, MRI, ultrasound highest category		
2	Nuritdinova Luiza Khusnitinovna	part-time worker		Radiology, CT, and ultrasound highest category		
3	Rasulmetova Mavluda Artukmetovna	part-time worker		Radiology highest category		
4	Rudenko Sergey Alexandrovich	part-time worker		Radiology, CT, MRI highest category		
5	Isaeva Laura Tolenbekovna	part-time worker		Ultrasound highest category		
8.	Thematic plan					
Week/day	Topic name	Summary	LO disciplines	Number of hours	Forms/methods/technologies of teaching	Forms/methods of assessment
1	Practice Nuclear Medicine.	Radionuclide pharmaceuticals in diagnostics and treatment.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Assessment of practical and professional skills, "Assessment 360" ⁰

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	SRRN\SRR Nuclear Medicine.	Application of nuclear medicine in practice	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
2	Practice. Single-photon emission computed tomography (SPECT) scanners	Research methodology. Principles of image acquisition.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Assessment of practical and professional skills, "Assessment 360 ⁰
	SRRN\SRR Single-photon emission computed tomography (SPET) scanners	Single-photon emission computed tomography devices	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
3	Practice. Positron emission tomography scanners.	PET research methodology.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Positron emission tomography scanners.	PET devices and operating principles	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
4	Practice. Applications of Nuclear Medicine	Cardiology, oncology, neurology, in oncology (radiobiology of tumors)	LO1 LO6	2	Assessment of practical and professional skills, "Assessment 360 ⁰	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Positron emission tomography scanners.	Applications of PET	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
5	Practice. Nuclear Medicine Challenges	Detection of tumors, metastases and relapses, determination of the extent of dissemination	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Positron emission tomography scanners.	сти опухолевого процесса, диффе ренциальная диагностика.	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
6	Practice. Radioisotope	In vitro (in vitro) and in vivo (in the	LO1 LO6	2	Work in the scintigraphy	Assessment of practical and

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	diagnostics	body) diagnostics.			room, examination of patients	professional skills, "Assessment 360 ⁰
	SRRN\SRR Radioisotope diagnostics	Radioisotope diagnostics in medicine	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
7	Practice. Gamma emitters	Gamma emitters - most often 99Tcm, 123I and 201Tl, and positron emitters.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Gamma emitters	Gamma emitters - most often 99Tcm, 123I and 201Tl, and positron emitters.	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
8	Practice. Scintigraphy of organs and systems	Research principles, radiopharmaceuti cals	LO1 LO6	2	Assessment of practical and professional skills, "Assessment 360 ⁰	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Scintigraphy of organs and systems	Scintigraphy of organs and systems	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
9	Practice. Brachytherapy	Methodology of using brachytherapy.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Brachytherapy	Brachytherapy in oncology	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
10	Practice. Radiation Therapy	External beam radiation therapy.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Assessment of practical and professional skills, "Assessment 360 ⁰
	SRRN\SRR Radiation Therapy	External beam radiation therapy.	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
11	Practice. Cyberknife	Radiosurgical tumor treatment. CyberKnife. Radiation therapy.	LO1 LO6	2	Assessment of practical and professional skills, "Assessment	Oral interviews, image interpretation, case studies, and checklist work

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					360 ⁰	
	SRRN\SRR Radiation Therapy	External beam radiation therapy.	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
12	Practice. General issues of radionuclide diagnostics. Radiopharmaceuticals for nuclear medicine.	General issues of radionuclide diagnostics. Radiopharmaceuticals for nuclear medicine.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR General issues of radionuclide diagnostics. Radiopharmaceuticals for nuclear medicine.	Radiopharmaceuticals for nuclear medicine.	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
13	Practice. General issues of radionuclide diagnostics. Radiopharmaceuticals for nuclear medicine.	General issues of radionuclide diagnostics. Radiopharmaceuticals for nuclear medicine.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Assessment of practical and professional skills, "Assessment 360 ⁰
	SRRN\SRR Radiopharmaceuticals for nuclear medicine.	Radiopharmaceuticals for nuclear medicine.	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
14	Practice. Recording equipment for radiodiagnostic research. Research methods.	Recording equipment for radiodiagnostic research. Research methods.	LO1 LO6	2	Assessment of practical and professional skills, "Assessment 360 ⁰	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Recording equipment for radiodiagnostic research. Research methods.	Recording equipment for radiodiagnostic research. Research methods.	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
15	Practice. Radionuclide diagnostics in oncology.	Radionuclide diagnostics in oncology.	LO1 LO6	2	Work in the scintigraphy room, examination of	Oral interviews, image interpretation, case studies, and

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	SRRN\SRR Radionuclide diagnostics in oncology. Border control No. 1	Radionuclide diagnostics in oncology.	LO1 LO6	6,5\ 1,5	patients Work in the library, on the Internet.	checklist work Interpretation of images with oncopathology Oral, test questions, diary and portfolio check
16	Practice. Radionuclide diagnostics in oncology.	Radionuclide diagnostics in oncology.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Assessment of practical and professional skills, "Assessment 360 ⁰
	SRRN\SRR Radionuclide diagnostics in oncology.	Radionuclide diagnostics in oncology.	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
17	Practice. Radionuclide diagnostics in cardiology.	Radionuclide diagnostics in cardiology.	LO1 LO6	2	Assessment of practical and professional skills, "Assessment 360 ⁰	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Radionuclide diagnostics in cardiology.	Radionuclide diagnostics in cardiology.	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
18	Practice. Myocardial perfusion scintigraphy.	Myocardial perfusion scintigraphy.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Myocardial perfusion scintigraphy.	Myocardial perfusion scintigraphy.	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
19	Practice. Myocardial perfusion scintigraphy.	Myocardial perfusion scintigraphy.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Assessment of practical and professional skills, "Assessment 360 ⁰
	SRRN\SRR Myocardial perfusion scintigraphy.	Myocardial perfusion scintigraphy.	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
20	Practice. Radionuclide	Radionuclide diagnostics in	LO1 LO6	2	Assessment of practical and	Oral interviews, image



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	diagnostics in nephrology and urology	nephrology and urology			professional skills, "Assessment 360 ⁰	interpretation, case studies, and checklist work
	SRRN\SRR Radionuclide diagnostics in nephrology and urology	Radionuclide diagnostics in nephrology and urology	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
21	Practice. Radionuclide diagnostics in nephrology and urology	Radionuclide diagnostics in nephrology and urology	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Radionuclide diagnostics in nephrology and urology	Radionuclide diagnostics in nephrology and urology	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
22	Practice. Radionuclide diagnostics in pulmonology	Radionuclide diagnostics in pulmonology, RPF used in pulmonology	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Assessment of practical and professional skills, "Assessment 360 ⁰
	SRRN\SRR Radionuclide diagnostics in pulmonology	Radionuclide diagnostics in pulmonology	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
23	Practice. Radionuclide diagnostics in pulmonology	Radionuclide diagnostics in pulmonology, RPF used in pulmonology	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Radionuclide diagnostics in pulmonology	Radionuclide diagnostics in pulmonology	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
24	Practice. Radionuclide diagnostics in angiology.	Radionuclide diagnostics in angiology.	LO1 LO6	2	Assessment of practical and professional skills, "Assessment 360 ⁰	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Radionuclide diagnostics in	Radionuclide diagnostics in angiology.	LO1 LO6	6,5\ 1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology

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	angiology.					
25	Practice. Radionuclide diagnostics of inflammation	Radionuclide diagnostics of inflammation	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Radionuclide diagnostics of inflammation	Radionuclide diagnostics of inflammation	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
26	Practice. Radionuclide diagnostics of gastrointestinal and hepatosplenic diseases. Radionuclide assessment of esophageal, gastric, and intestinal dysfunction.	Radionuclide diagnostics of gastrointestinal and hepatosplenic diseases. Radionuclide assessment of esophageal, gastric, and intestinal dysfunction.	LO1 LO6	2	Assessment of practical and professional skills, "Assessment 360 ⁰ "	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Radionuclide diagnostics of diseases of the gastrointestinal tract and hepatosplenic system.	Radionuclide diagnostics of diseases of the gastrointestinal tract and hepatosplenic system.	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
27	Practice. Radionuclide diagnostics of diseases of the gastrointestinal tract and hepatosplenic system.	Radionuclide diagnostics of gastrointestinal and hepatosplenic diseases.	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Scintigraphic studies in the diagnosis of liver diseases.	Scintigraphic studies in the diagnosis of liver diseases.	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology

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28	Practice. Radionuclide diagnostics of skeletal diseases	Radionuclide diagnostics of skeletal diseases	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Assessment of practical and professional skills, "Assessment 360 ⁰
	SRRN\SRR Radionuclide diagnostics of skeletal diseases	Radionuclide diagnostics of skeletal diseases	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
29	Practice. Radionuclide diagnostics in neurology and psychiatry	Radionuclide diagnostics in neurology and psychiatry	LO1 LO6	2	Work in the scintigraphy room, examination of patients	Oral interviews, image interpretation, case studies, and checklist work
	CPPH\CPP Radionuclide diagnostics in neurology and psychiatry	Radionuclide diagnostics in neurology and psychiatry	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology
30	Practice. Radionuclide diagnostics in andrology and gynecology	Radionuclide diagnostics in andrology and gynecology	LO1 LO6	2	Assessment of practical and professional skills, "Assessment 360 ⁰	Oral interviews, image interpretation, case studies, and checklist work
	SRRN\SRR Radionuclide diagnostics in andrology and gynecology Border control No. 2	Radionuclide diagnostics in andrology and gynecology	LO1 LO6	6,5\1,5	Work in the library, on the Internet.	Interpretation of images with oncopathology Oral, test questions, diary and portfolio check
	Total			60/195/45		
Preparation and conduct of the final control 30 hours						
9.	Methods of training and control					
9.1	Lecture	Not provided at this level				
9.2	Practical lesson	Assessment of practical and professional skills, "Assessment 360 ⁰				
9.3	SRRN\SRR	Working in the radiation diagnostics department. Analysis of a scientific article. Oral interview.				
9.4	Border control	Testing				
10	Assessment Criteria					
10.1	Learning Outcome Assessment Criteria					
	Learning	Unsatisfactory	Satisfactorily	Fine	Great	




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LO	outcomes				
LO1	They conduct an initial examination, prescribe a diagnostic examination, interpret the results of X-ray, CT, MRI, ultrasound and mammographic studies and, based on the data obtained, provide a medical opinion.	Demonstrates significant gaps in knowledge of the basic educational program material, made defects in examining a patient, is unable to demonstrate the necessary minimum diagnostic skills, conduct a differential diagnosis, and prescribe diagnostic and therapeutic measures for the patient.	Has a minimum knowledge of all sections of the program, has conducted patient examinations to the extent necessary to identify typical signs of the pathology being studied, and is familiar with the principles of prescribing additional examination and treatment. Has made moderate errors in examining patients and demonstrating practical skills.	Uses the full meaning of the educational program material with minimal shortcomings, is proficient in radiological research methods and is able to conduct an objective examination of the patient, prescribe additional examination methods, conduct differential diagnostics and substantiate the diagnosis	Demonstrates a comprehensive, systematic, and in-depth knowledge of the curriculum, practical skills that enable competent and complete examination of a patient, identification and interpretation of detected signs of disease, prescription of additional research methods, reasoned differential diagnosis, and substantiation of the diagnosis
LO6	able to learn independently and teach other members of the professional team, actively participate in discussions, conferences and other forms of	unable to learn independently and teach other members of the professional team, to passively participate in discussions, conferences and other	Poorly able to learn independently and train other members of a professional team, and inactively participate in discussions, conferences,	able to learn independently and teach other members of a professional team, but does not often actively participate in discussions, conferences, and other forms of continuous	Highly capable of learning independently and training other members of the professional team, very active in participating in discussions, conferences and other forms of continuous professional

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continuous professional development	forms of continuous professional development	and other forms of continuous professional development	professional development	development
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10.2 Evaluation criteria for teaching and learning methods

Checklists for practical classes

Checklists: Criteria for assessing practical skills, professional skills:	Excellent score: A (4.0; 95-100%) A- (3.67; 90-94%)	History taking: systematically collected, the history fully reflects the dynamics of the disease development; Physical examination: performed systematically, technically correct, and effectively; Preliminary diagnosis: correctly established, justified; Laboratory and instrumental examination methods for the disease: complete and adequate; Patient examination results (interpretation): complete and accurate; Differential diagnosis: complete; Final diagnosis and its rationale: complete and well-founded; Treatment selection: treatment is very adequate; Understanding the mechanism of action of the prescribed treatment: complete; Determining prognosis and prevention: adequate and complete.
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		<p>Well matches the ratings: B+ (3,33; 85-89%) B (3,0; 80-84%) B- (2,67; 75-79%) C+ (2,33; 70-74%)</p>	<p>History taking: systematically collected, but without sufficient clarification of the nature of the main symptoms and possible causes; Physical examination: systematic, but minor technical inaccuracies Preliminary diagnosis: correct, but lacking justification; Laboratory and instrumental testing: adequate, but with minor deficiencies; Interpretation of patient examination results: correct, with minor inaccuracies; Differential diagnosis: proven, but not with all similar diseases; Final diagnosis and its justification: diagnosis of the underlying disease is complete, but concomitant diseases are not indicated; Treatment selection: correct but incomplete or polypharmacy; Understanding the mechanism of action of the prescribed treatment: errs on minor details; Determining prognosis and prevention: adequate but incomplete.</p>
		<p>Satisfactorily meets the assessments: C (2,0; 65-69%); C- (1,67; 60-64%); D+ (1,33; 55-59%) D (1,0; 50-54%)</p>	<p>History taking: collected with a record of facts that do not provide insight into the nature of the disease and the sequence of symptom development; Physical examination: complete technical examination with incomplete errors; Preliminary diagnosis: the leading syndrome has been identified, but a diagnostic conclusion is not available; Prescription of laboratory and instrumental diagnostic methods for the disease: not entirely adequate; Expertise (interpretation) of patient examination results: partially correct with significant errors; Differential diagnosis: Incomplete; Final diagnosis and its rationale: the diagnosis is insufficiently substantiated; complications and comorbidities have not been identified; Treatment options: treatment for the primary and secondary conditions is incomplete; Understanding the mechanism of action of the prescribed treatment: Incomplete; Prognosis and prevention: inadequate and incomplete.</p>

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		Unsatisfactory meets the ratings: FX (0,5; 25-49%) F (0; 0-24%)	History taking: details are haphazardly collected and irrelevant to the diagnosis of facts; Physical examination: lacks manual skills; Preliminary diagnosis: error; Prescription of laboratory and instrumental tests for the disease: contraindications are prescribed; Patient examination results (interpretation): in most cases, incorrect; Differential diagnosis: productive; Final diagnosis and its rationale: the diagnosis is explained chaotically, less convincingly; Treatment options: Reversible medications are prescribed; Understand the mechanism of action of the prescribed treatment: Cannot explain correctly; Determining the prognosis and prevention: Could not determine.
	Checklists: Mentor's "360" Assessment:	Excellent score: A (4,0; 95-100%) A- (3,67; 90-94%)	Preparation: Continuous self-education: e.g., supporting statements with relevant references, writing a brief summary; Responsibility: Takes responsibility for one's own learning: e.g., managing one's own curriculum, actively seeking improvement, critically evaluating information resources; Participation: Actively participates in group learning, such as actively participating in discussions and taking on assignments carefully. Group Skills: Demonstrates effective group skills, such as taking initiative, showing respect and integrity toward others, and helping to resolve misunderstandings and conflicts. Communication: Articulates in interactions with peers: e.g., receptive to nonverbal and emotional cues, active listening; Professionalism: Highly developed professional skills: e.g., excellent engagement, confidence, attentiveness to feedback, and the ability to learn from it; Reflection: High self-awareness: for example, recognizes the limitations of one's knowledge or abilities without becoming defensive or warning others; Critical Thinking: Highly developed critical thinking: demonstrates skills in performing basic tasks such as generating hypotheses, applying knowledge to practice, critically




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			<p>evaluating information, drawing conclusions out loud, and explaining thought processes; Teaching: Effective Teaching Skills: Presents problematic issues relevant to the situation at hand in an appropriately structured manner. Uses notes or summarizes material to enhance recall by others. Practical Skills: Drives for achievement, seeks opportunities, is reliable and competent.</p>
		<p>Unsatisfactory meets the ratings: FX (0,5; 25-49%) F (0; 0-24%)</p>	<p>Preparation: Lack of desire to improve, e.g., insufficient study and exploration of problematic issues, insignificant contribution to the group's knowledge, lack of accumulation of material; Responsibility: Fails to take responsibility for their own learning: e.g., in conjunction with others when implementing the learning plan, conceals mistakes, rarely critically analyzes resources; Participation: Inactive in the group learning process: e.g., inactively participates in the discussion process, accepts assignments carefully; Group Skills: Demonstrates ineffective group skills, such as inappropriately interfering, demonstrating poor discussion skills, interrupting, evading, or ignoring others, dominating, or being intolerant; Communication: Difficulty interacting with peers: e.g., poor listening skills inability or propensity to pay attention to nonverbal or emotional cues; Professionalism: Deficits in professional behavior: e.g., acting out, lacking self-confidence, difficulty receiving feedback; Critical Thinking: Deficient critical thinking: for example, difficulty completing basic tasks. Typically, the individual does not generate hypotheses, does not apply knowledge in practice, or is unable to critically evaluate information due to a lack of knowledge or inattention (lack of induction); Learning: Ineffective learning skills: poor presentation of problematic issues, regardless of the situation, and in a poorly structured style. Ineffective use of notes, does not prepare notes,</p>

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		cannot summarize material, cannot explain material to others; Practical skills: Uncomfortable, afraid, even refuses to perform basic procedures.
Checklists: "360°-Degree Assessment" Head of Department:	Excellent score: A (4,0; 95-100%) A- (3,67; 90-94%)	Reliability: Responsible, strives to be helpful; Response to instructions: Responds correctly, consistently improves, learns from mistakes; Training: Possesses good knowledge and broad outlook, strives for greater knowledge; Attitude toward patients: Reliable and captivating; Relationship with colleagues: Sets a tone of mutual respect and dignity; Relationship with medical staff: Sets a tone of mutual respect and dignity; Coping under stress: Full self-management, constructive solutions; Group skills: Can organize work or be an effective member of a team; Record keeping: Competent, accurate, and timely; Practical skills: Strives for accomplishment, seeks opportunities, is reliable and qualified
	Unsatisfactory meets the ratings: FX (0,5; 25-49%) F (0; 0-24%)	Reliability: Unclear, unreliable; Response to instructions: No response, no improvement; Training: No desire, no knowledge; Attitude toward patients: No personal contact; Attitude toward colleagues: Unreliable; Attitude toward medical staff: Unreliable, rude; Behavior under stress: Inadequate, stuporous; Group skills: Unreliable or a spoiler; Map management: Careless, incorrect, untimely; Practical skills: Uncomfortable, afraid, even refusing to perform basic procedures
Checklists: "360 Assessment" Resident:	Excellent score: A (4,0; 95-100%) A- (3,67; 90-94%)	Reliability: Responsible, strives to be helpful; Response to instructions: Responds correctly, consistently improves, learns from mistakes; Training: Possesses good knowledge and broad outlook, strives for greater knowledge; Attitude toward patients: Reliable and captivating;



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		<p>Relationship with colleagues: Sets a tone of mutual respect and dignity; Relationship with medical staff: Sets a tone of mutual respect and dignity; Coping under stress: Full self-management, constructive solutions; Group skills: Can organize work or be an effective member of a team; Record keeping: Competent, accurate, and timely; Practical skills: Strives for accomplishment, seeks opportunities, is reliable and qualified.</p>
	<p>Unsatisfactory meets the ratings: FX (0,5; 25-49%) F (0; 0-24%)</p>	<p>Reliability: Unclear, unreliable; Response to instructions: No response, no improvement; Training: No desire, no knowledge; Attitude toward patients: No personal contact; Attitude toward colleagues: Unreliable; Attitude toward medical staff: Unreliable, rude; Behavior under stress: Inadequate, stuporous; Group skills: Unreliable or interrupted; Map management: Careless, incorrect, untimely; Practical skills: Uncomfortable, afraid, even refusing to perform basic procedures.</p>
<p>Checklists: "360-degree Assessment" Duty Doctor:</p>	<p>Excellent score: A (4,0; 95-100%) A- (3,67; 90-94%)</p>	<p>Reliability: Responsible, strives to be helpful; Response to instructions: Responds correctly, consistently improves, learns from mistakes; Training: Possesses good knowledge and broad outlook, strives for greater knowledge; Attitude toward patients: Reliable and captivating; Relationship with colleagues: Sets a tone of mutual respect and dignity; Relationship with medical staff: Sets a tone of mutual respect and dignity; Action under stress: Full self-management, constructive solutions; Group skills: Can organize work or be an effective member of a team; Mapping: Competent, accurate, and timely; Practical skills: Driven to deliver, seeks opportunities, reliable, and qualified.</p>
	<p>Unsatisfactory</p>	<p>Reliability: Unclear, unreliable;</p>

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	meets the ratings: FX (0,5; 25-49%) F (0; 0-24%)	Response to instructions: No response, no improvement; Training: No desire, no knowledge; Attitude toward patients: No personal contact; Attitude toward colleagues: Unreliable; Attitude toward medical staff: Unreliable, rude; Behavior under stress: Inadequate, stuporous; Group skills: Unreliable or interrupted; Map management: Careless, incorrect, untimely; Practical skills: Uncomfortable, afraid, even refusing to perform basic procedures.
Checklist for SRRN/SRR		
Working in the radiation diagnostics department	Presentation preparation, portfolio <ul style="list-style-type: none"> • participation in in-hospital and pathology conferences, treatment of patients in emergency rooms and intensive care units, hospital (clinic) shifts, participation in consultations, and consultations for seriously ill patients outside of normal working hours; • preparing patients for clinical examinations and rounds with the department head, professor, or associate professor; • preparing thematic presentations for medical conferences; • maintaining medical records; • participating in medical examinations and screenings of patients; • performing mandatory health education activities for physicians; • participating in the department's Student Scientific Society, presenting at scientific conferences participating in scientific and practical conferences, symposia, etc.	
Analysis of scientific articles:	Excellent score: A (4,0; 95-100%) A- (3,67; 90-94%)	Demonstrates knowledge and understanding of medical research: Knowledge is systemic and fully reflects an understanding of medical research; Able to solve problems within the scope of their qualifications using scientific approaches: The solution is correct; Uses scientific information and principles of evidence-based medicine to develop within the scope of their qualifications: fully justified; Demonstrates self-analysis skills: Fully utilized; Uses public speaking and oratory skills at in-hospital conferences, seminars, and discussions: Fully utilized and adequately; Capable of conducting research and working toward scientific results: Participates and communicates, engages audiences, and convinces them of their findings;

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		<p>Medical research demonstrates knowledge and understanding: Conducts research, summarizes research results, and publishes them.</p>
	<p>Well-matched ratings: B+ (3,33; 85-89%) B (3,0; 80-84%) B- (2,67; 75-79%) C+ (2,33; 70-74%)</p>	<p>Demonstrates knowledge and understanding of medical research: Knowledge that captures facts that do not provide a complete understanding of the nature of the research; Able to solve problems within the scope of their qualifications based on scientific approaches: The solution is correct; Uses scientific information and the principles of evidence-based medicine to develop within the scope of their qualifications: Partially based; Demonstrates self-analysis skills: Partially utilizes; Uses public speaking and oratory skills at in-hospital conferences, seminars, and discussions: adequate, but with minor errors; Capable of conducting research and working toward scientific results: Poor presentations and reports; Research in the field of medicine demonstrates knowledge and understanding: Conducts research, conclusions are partial, analysis is incomplete.</p>
	<p>Satisfactory meets the following assessments: C (2,0; 65-69%); C- (1,67; 60-64%); D+ (1,33; 55-59%) D (1,0; 50-54%)</p>	<p>Demonstrates knowledge and understanding of medical research: clarification of facts is not important; Able to solve problems within the scope of their qualifications based on scientific approaches: Difficulty making decisions, unable to justify them; Uses scientific information and principles of evidence-based medicine to develop within the scope of their qualifications: Uses unreliable or incomplete information; Demonstrates self-analysis skills: diagnosis is not detailed, trust is low; Uses public speaking and oratory at in-hospital conferences, seminars, and discussions: Rarely participates, without enthusiasm. Able to conduct research and work towards scientific results: Conducts research, but systematizes it; Research in the field of medicine demonstrates knowledge and understanding: With</p>

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		clarification of irrelevant facts.
	Unsatisfactory meets the ratings: FX (0,5; 25-49%) F (0; 0-24%)	Demonstrates knowledge and understanding of medical research: Does not demonstrate; Able to solve problems within the scope of their qualifications using scientific approaches: Cannot solve problems; Uses scientific information and principles of evidence-based medicine to develop within the scope of their qualifications: Does not demonstrate; Demonstrates self-analysis skills: Does not demonstrate; Uses public speaking and oratory skills at in-hospital conferences, seminars, and discussions: Does not participate; Capable of conducting research and working toward scientific results: Does not conduct research; Research in the field of medicine demonstrates knowledge and understanding: Does not demonstrate.
Oral response.	Excellent score: A (4,0; 95-100%); A- (3,67; 90-94%)	The resident did not make any errors or inaccuracies in his or her answers. He or she is familiar with the theory, concepts, and trends of the discipline being studied, using recent monographs and manuals, as well as the internet, and provides a critical evaluation of them, drawing on the scientific achievements of other disciplines. He or she actively participated in medical rounds, consultations, and reviewing case histories with his or her supervisor.
	Well-matched ratings: B+ (3,33; 85-89%); B (3,0; 80-84%); B- (2,67; 75-79%); C+ (2,33; 70-74%)	The resident made no serious errors in his answers, made minor inaccuracies, and was able to systematize the program material using the textbook. He participated little with his supervisor in medical rounds, consultations, and reviewing case histories.
	Satisfactory meets the following assessments: C (2,0; 65-69%); C- (1,67; 60-64%); D+ (1,33; 55-59%); D- (1,0; 50-54%)	The resident made inaccuracies and minor errors in his answers, limited himself to widely known textbooks, and experienced significant difficulties systematizing the material. He rarely participated with his supervisor in medical rounds, consultations, or reviewing case histories.

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	Unsatisfactory meets the ratings: FX (0,5; 25-49%) F (0; 0-24 %)	The resident made fundamental errors during his answers, failed to review the relevant literature, was unable to use the scientific terminology of the discipline, and made gross stylistic and logical errors. He did not participate with his supervisor in medical rounds, consultations, or review of case histories.
portfolio	Excellent score: A (4,0; 95-100%) A- (3,67; 90-94%)	Portfolios at this level are characterized by comprehensiveness in reflecting key categories and assessment criteria. The content of such a portfolio demonstrates significant effort and clear progress on the part of the student. Originality and inventiveness are clearly evident in the content and design of portfolios at this level.
	Well-matched ratings: B+ (3,33; 85-89%) B (3,0; 80-84%) B- (2,67; 75-79%) C+ (2,33; 70-74%)	Portfolios at this level are characterized by comprehensiveness in reflecting key categories and assessment criteria. The content of such a portfolio demonstrates significant effort and clear progress on the part of the student. Originality and inventiveness are clearly evident in the content and design of portfolios at this level.
	Satisfactory meets the following assessments: C (2,0; 65-69%); C- (1,67; 60-64%); D+ (1,33; 55-59%) D (1,0; 50-54%)	The portfolio at this level focuses primarily on the mandatory category, which can be used to assess the level of development of program knowledge and skills. There is no evidence demonstrating the level of development of research, creative thinking, applied skills, meaningful communication (both oral and written), social initiative, etc.
	Unsatisfactory meets the ratings: FX (0,5; 25-49%) F (0; 0-24%)	A portfolio that makes it difficult to form a general understanding of a student's achievements. Typically, it presents fragmented information from various categories. From such a portfolio, it is virtually impossible to determine learning progress and the level of development of qualities reflecting key general cultural and professional competencies.

Checklist for midterm assessment

Testing is assessed using a multi-point knowledge assessment system.

Multi-point knowledge assessment system

Letter grading system	Digital equivalent of points	Percentage	Assessment according to the traditional system
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A	4,0	95-100	Great
A -	3,67	90-94	
B +	3,33	85-89	Fine
B	3,0	80-84	
B -	2,67	75-79	
C +	2,33	70-74	Satisfactorily
C	2,0	65-69	
D+	1,33	55-59	
D-	1,0	50-54	
FX	0,5	25-49	Unsatisfactory
F	0	0-24	

11 Learning Resources

Electronic resources (e.g., video, audio, digests)
 SKMA Electronic Library - <https://e-lib.skma.edu.kz/genres>
 Republican Interuniversity Electronic Library – <http://rmebrk.kz/>
 Aknurpress Digital Library- <https://www.aknurpress.kz/>
 Epigraph Electronic Library- <http://www.elib.kz/>
 Epigraph - Multimedia Textbook Portal <https://mbook.kz/ru/index/>
 ЭБС IPR SMART <https://www.iprbookshop.ru/auth>
 Information and legal system "Zan" - <https://zan.kz/ru>
 Cochrane Library - <https://www.cochranelibrary.com/>

Electronic textbooks

Journals (electronic journals)

Literature

Main literature:

Radiation Diagnostics of Respiratory and Mediastinal Diseases [Text]: a tutorial / E. B. Bekmurotov [et al.]; Ministry of Health and Social Development of the Republic of Kazakhstan. SKSPHA. - Shymkent: [b. i.], 2016. - 104 p.
 Mukhametzhanov, A. M. General and Military Radiobiology [Мәтін]: a tutorial / A. M. Mukhametzhanov, M. K. Abdakalikov; - Karaganda: IP "Izd-vo Aknur", 2013. - 174 p.
 Ilyasova, E. B. Radiation Diagnostics [Text]: a tutorial / E. B. Ilyasova, M. L. Chekhonatskaya, V. N. Priezzheva. - M.: GEOTAR - Media, 2013. - 280 p.
 Sauleli diagnostics [Matin]: okulyk / RF white. Minister of League; G. E. Trufanovtyn editorial office; Kazak tiline aud. A. B. Akhmetbaeva; zhaupt ed. A.K. Akhmetbaeva. - ; I. M. Sechenov atyndagy State Educational Institution of Higher Professional Education "Birinshi Moscow Medical University" Usyngan. - M.: GEOTAR - Media, 2014. - 576 bet.

Further reading:

Radiology of Respiratory and Mediastinal Diseases [Electronic resource]: study guide / E. B. Bekmurotov [et al.]; Ministry of Health and Social Development of the Republic of Kazakhstan. SKSPHA. - Electronic text data. - Shymkent: [b. i.], 2016. - electronic optical disc (CD-ROM) (8.91 MB)
 Radiology and Therapy in Obstetrics and Gynecology [Text]: national management / series editor-in-chief S. K. Ternovaya, volume editor-in-chief L. V. Adamyan. - Moscow: GEOTAR-Media, 2012. - 656 p.
 Radiology and Therapy in Gastroenterology [Text]: national management / editor-in-chief series by S.K. Ternova, ch. ed. volumes G. G. Karmazanovsky. - M.: GEOTAR - Media, 2014. - 920 p. : ill.

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Electronic resources:

Yadrolyk medicine: Oku kuraly. / L.T. Kasaeva, A.A. Seytova, A.O. Sergazina, G.A. Umurzakova. - Shymkent, 2023. – 62

<http://rmebrk.kz/book/1184130>

Matveev, A. V. Nuclear Medicine. Radioisotopes and Pharmaceuticals: a tutorial / A. V. Matveev. - Omsk: Omsk State University named after F. M. Dostoevsky, 2016. - 128 p. - ISBN 978-5-7779-1968-7. - Text: electronic // Digital educational resource IPR SMART: [site]. - URL: (date accessed: 06/24/2024). - Access mode: for authorized users

<https://www.iprbookshop.ru/59664.html>

Yadrolyk medicine [Electronic resource]: oku kuraly / L. T. Kasaeva, A. A. [zhәне t.b.]. - Electron. text data (25.6 MB). - Shymkent: OKMA, 2023. - 62 b. email wholesale disk (CD-ROM)

Klimanov, V.A. Nuclear medicine. Radionuclide diagnostics [Text]: textbook for universities / V. A. Klimanov. - 2nd ed., rev. and additional - Moscow: Yurayt, 2020. - 305


<http://lib.ukma.kz/wp-content/uploads/2023/04/Ядролык-мед..pdf>

Pasha, S.P. Radionuclide diagnostics [Electronic resource]: textbook. allowance / S.K. Ternova. - Electron. text data (34.9 MB). - M.: GEOTAR - Media, 2008. - 208 p. email wholesale disk (CD-ROM): ill. - (Pocket atlases on radiation diagnostics).


Radiobiology, radiation physiology and medicine: dictionary-reference book / V. I. Legeza, I. B. Ushakov, A. N. Grebenyuk, A. E. Antushevich. — 3rd ed. - St. Petersburg: Foliant, 2017. - 176 p.

<https://www.iprbookshop.ru/epd-reader?publicationId=90218>


12. Discipline policy	
Requirements for residents	Penalties and incentives
Current knowledge monitoring for residents	<ul style="list-style-type: none"> • If a student fails to comply with the established exam requirements (using cheat sheets, mobile devices, or other devices), commits disciplinary violations, or interferes with other students, KTIC and OR representatives have the right to remove them from the classroom. In this case, a report on the violation of the exam procedure is drawn up, the exam results are annulled, and an "F" or "0" is entered in the report card. • Retakes are not permitted. The student re-enrolls in the given academic discipline/module on a paid basis, attends all types of classes, completes all types of academic work according to the program, and retakes the final assessment.
Missing classes without a valid reason is not allowed.	Unexcused missed classes will not be made up. Residents who miss classes without an excuse or who fail to complete a class in their electronic journal will be assigned a grade of "0" in the cell next to the "n" mark during the last week of the academic period for full-time classes or two days before the exam for full-time classes.
Make up missed classes promptly for a valid reason.	<ul style="list-style-type: none"> • Missed classes for a valid reason are made up upon presentation of a supporting document (due to illness, family circumstances, or other objective reasons). The resident is obliged to provide a certificate to the dean's office no later than 5 working days from the date of its receipt. In the absence of supporting documents or if they are submitted to the dean's office later than 5 working days after returning to classes, the reason is considered unexcused. • The resident submits an application to the dean and receives a work slip with a due date, which is valid for 30 days from the date of receipt at the dean's office. Residents who miss classes for a valid reason will have the

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	<p>grade received for the class completed entered in the electronic journal in the cell next to the "n" mark. In this case, the "n" mark is automatically cancelled.</p> <ul style="list-style-type: none"> Residents who missed classes by order of the dean for release are not given an "N" grade, but an average grade for their academic performance; midterm assessment is completed
Attending the SRRP and practical classes on time.	If a resident is more than 5 minutes late, they will not be admitted to class. A late note will be posted in the class log.
The resident must have appropriate attire (gown, cap, change of shoes, etc.).	If the appearance is not appropriate, the resident is not allowed to attend classes or work in the department; a negative mark is entered in the academic record book.
The student must have a medical certificate.	Without a health certificate, a resident is not allowed into the clinic departments; a health certificate is entered into the educational journal.
SRRN	The SRR assessment is given during SRR classes according to the schedule in the electronic journal.
Timely completion of tasks according to the SRR.	The SRR grade is assigned during SRR classes according to the schedule in the academic progress journal and the electronic journal, taking into account penalty points.
A resident must treat faculty and fellow students with respect.	If a resident behaves disrespectfully, this behavior is discussed at a department meeting, and the dean's office and parents are notified.
Residents treat the department's property with care.	In the event of destruction of the department's property, the resident is responsible for restoring the property on his own.
Frontier control	<p>Midterm assessments of students' knowledge are conducted:</p> <ul style="list-style-type: none"> at least twice during one cycle, depending on the duration of theoretical training. A resident with three or more absences from practical classes, including the SRP class, is not allowed to take midterm assessments. Midterm assessment results are posted in the electronic journal in a timely manner. A student who fails to attend a midterm assessment without a valid excuse will not be allowed to take the exam in the subject. A student who fails to attend a midterm assessment without a valid excuse must, immediately after starting classes, submit a request to the dean, provide supporting documents (due to illness, family circumstances, or other objective reasons), and receive a work permit, which is valid for the period specified in slide 5.
Adjustment of assessments of current and midterm controls	Adjustments to grades for ongoing and midterm assessments are made in the event of technical errors in completing the electronic journal based on an explanatory note from the instructor (signed by the head of department, dean of faculty, and compliance officer) indicating the reason; permission from the Vice-Rector for Academic and Methodological Work.
Final control assessment	A resident who does not achieve a passing score (50%) in one of the types of control (current control, midterm control No. 1 and/or No. 2) is not admitted

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	to the exam in the discipline.
13.	Academic policy based on the moral and ethical values of the academy
<p>Academic Policy. Section 4. Student Honor Code</p> <p>A resident of the Academy is a patriot of the Republic of Kazakhstan and highly reveres the flag, coat of arms, anthem, and state language—the main attributes of sovereign Kazakhstan. Residents respect and uphold the glorious traditions and moral values of the Academy's predecessors.</p> <p>Residents unwaveringly recognize and respect national priorities and age-old spiritual and moral values, and fulfill the high standards of moral and ethical status of citizens of the Republic of Kazakhstan.</p> <p>A resident consciously believes that interethnic and interfaith harmony is the foundation of our values and unity.</p> <p>A resident is a proponent and promoter of a healthy mental and physical lifestyle.</p> <p>A resident consciously and actively participates in the creative process of civic self-determination, self-realization, self-improvement, and personal growth in professional, intellectual, cultural, and moral development.</p> <p>Residents remember that their instructor is their teacher, mentor, and educator, worthy of deep respect and gratitude. Residents maintain subordination in their relationships with instructors and the Academy's leadership.</p> <p>Residents are disciplined, polite, and sociable, adhere to generally accepted moral and ethical standards of conduct in public and at home, and are self-critical and demanding of themselves and their actions.</p> <p>Residents condemn and actively promote the rejection and opposition of any corrupt practices, corrupt worldviews, and behavior within the Academy among residents and instructors.</p>	
GRADING POLICY	
Grading Policy for the Course	
Ongoing Assessment: Testing, Case Study Assessment, Discussion Assessment Sheet, Small Group Assessment Sheet, Round Table Assessment Sheet, Diagnostic Algorithm, and Treatment Plans	
Midterm assessment: Testing. Assessment of mastery of practical skills.	
Midterm assessments are conducted at least twice during one academic period, on days 7/12 of theoretical instruction. The results of these assessments are recorded in the academic progress log and electronic journal, taking into account any penalty points for absent lectures (penalty points for absent lectures are deducted from the midterm assessment grades).	
- The penalty for missing one lecture without a valid excuse is 1.0 point;	
A resident who fails to attend the midterm assessment without a valid excuse is not allowed to take the course exam. A resident who fails to attend the midterm assessment without a valid excuse must submit a request to the dean immediately after starting classes, provide supporting documentation (due to illness, family circumstances, or other objective reasons), and receive a work slip, which is valid for the period specified in paragraph 12.4. The results of the midterm assessment must be submitted to the dean's office in the form of a report by the end of the assessment week.	
- The SRS grade is assigned during SRS classes according to the schedule in the academic progress log and the electronic progress log, with penalty points deducted from the SRS grades.	
- Missing one SRS class results in a penalty point of 2.0;	
- A resident who fails to achieve a passing score (50%) on one of the assessment types (current assessment, midterm assessment No. 1 and/or No. 2) is not admitted to the course exam.	
- The exam grade is assigned based on the results of the current and midterm assessments (60%) and the final assessment (40%).	
- The admission rating score (ARS) is determined as the average of the scores for practical classes, the	

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final assessment, and the midterm assessment.
 - A student who achieves a minimum ARS score of 1 (15%) or higher is admitted to the exam.
Final assessment: an exam including OSCE and testing.

14. Approval, approval and revision			
Date of agreement with the Library and Information Center	Protocol No <u>7</u> « <u>25</u> » <u>06</u> 2025	Head of BIC Darbicheva R.I.	
Date of approval by the department	Protocol No <u>11</u> « <u>26</u> » <u>06</u> 2025	Head of the department Kasaeva L.T	
Date of approval for AC EP	Protocol No <u>5a</u> « <u>26</u> » <u>06</u> 2025	Chairman of the AC EP Kauzyzbay Zh.A	
Date of approval by the department	Protocol No _____ « _____ » _____ 2025	Head of the department Kasaeva L.T	
Date of approval for AC EP	Protocol No _____ « _____ » _____ 2025	Chairman of the AC EP Kauzyzbay Zh.A	