JSC "SOUTH KAZAKHSTAN MEDICAL ACADEMY"

"I APPROVE"
Rector of SKMA, Professor
_____ M. Rysbekov
"31" _____ 2024

SOUTH KAZAKHSTAN
MEDICAL
ACADEMY

EDUCATIONAL RESIDENCY PROGRAM

7R01120

"Neurosurgery (adult, child)"

Shymkent, 2024

The educational residency program "Neurosurgery (adult, children)" was developed on the basis of the order of the Minister of Health of the Republic of Kazakhstan dated January 25, 2024 No. 46 "On approval of professional standards in the field of healthcare."

EPst	Full name	Signature
DevelEPed by		
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Minutes of the department meeting №6 «15» «01» 2024 y.		
Discussed at the meeting of the Residency Educational Programs Committee Chairman of the Committee of Educational Programs Protocol No. 5 from "26" " 01 " 2024y	Kauyzbai Zh.A.	
Agreed at the Clinical Council Chairman of the Clinical Council Protocol No. 8 from "29" " 01 " 2024y	Kauyzbai Zh.A.	
Agreed by the First Vice-Rector of JSC SKMA, First Vice-Rector of JSC SKMA Protocol No._____ from 30.01 2024	Esirkepov M.M.	
Approved by the Academic Council Protocol No. 14 from "31" " 01 " 2024y		

Educational program passport

1.The mission of educational program: To be a recognized leader in the training of competitive personnel, meeting the resident physician's need to achieve learning outcomes, providing the health care system and society with highly qualified neurosurgical physicians

2.The purees of educational program: is to train qualified, competitive personnel who meet modern requirements for the quality of doctors to conduct independent professional activity as a neurosurgeon.

Tasks of studying the discipline:

1. advanced study and mastering of theoretical sections neurosurgery;
2. improvement of practical skills on modern principles of diagnostics, interpretation of the results of the examination from the point of view of evidence-based medicine;
3. independent implementation of qualified medical care for various conditions and diseases.

3. Justification of the educational program:

Neurosurgery is a specialized branch of surgery concerned with the diagnosis, treatment, and rehabilitation of patients with diseases, injuries, or congenital abnormalities of the nervous system, including the brain, spinal cord, and peripheral nerves. Neurosurgeons undergo extensive training and education to perform advanced procedures and minimize the risks associated with surgery on one of the body's most complex and delicate systems.

Neurosurgery is closely related to neurophysiology, radiology, radiology and other areas of clinical medicine. Widely uses their research methods, primarily X-ray (including computed tomography), radionuclide, ultrasound, etc. Achievements in microsurgery play an important role in the development of neurosurgery. Specific to neurosurgery is the stereotactic method, which allows surgical instruments to reach deep structures and various points of the brain with minimal damage to other parts of the brain.The main sections of neurosurgery: neuro-oncology, neurotraumatology, neuroangiology, pediatric neurosurgery, surgery of the consequences and complications of infectious-inflammatory processes and congenital malformations of the central nervous system, functional and stereotactic neurosurgery, spinal neurosurgery.

Modern neurosurgery deals with the problems of surgical and non-operative treatment of a fairly wide range of diseases of the nervous system. This includes the treatment of tumors of the brain and spinal cord, and trauma to the central nervous system, as well as peripheral nerves, infections of the nervous system, and anomalies of its development.

One of the pressing problems today is also the problem of osteochondrosis and vertebral hernias. An equally serious area of neurosurgery is the treatment of cerebral circulatory disorders, which include strokes. Modern trends in the development of vascular surgery have made it possible to achieve certain successes in reconstructive surgery of cerebral circulatory disorders. These are methods such as carotid endarterectomy, in which an atheromatous plaque is removed from the lumen of the carotid artery, the application of extra-intracranial anastomoses to provide the brain with an additional source of blood supply, as well as balloon angioplasty and stenting of the corresponding vessels. Another achievement of modern neurosurgery is the surgical treatment of epilepsy. If earlier this disease was treated exclusively with drug therapy, which was not always successful, now with the development of stereotactic methods, surgical treatment of epilepsy has developed. The treatment of brain tumors remains a very important problem in neurosurgery. In addition to the surgical method, which involves a mandatory craniotomy to access the tumor, radiosurgical methods are widely used - the so-called stereotactic radiosurgery. This method involves irradiating the tumor from different angles with a powerful flow of radiation.

Of particular importance was the introduction into the practice of neurosurgery of modern methods of pain relief and resuscitation, which made it possible to control the vital functions of

the body during and after neurosurgical interventions. The use of intravascular surgery and microsurgery methods is promising.

4. Professional standard on the basis of which the educational program was developed: Professional standard "Neurosurgery (adults, children)".

According to the Order of the Minister of Health dated January 25, 2024 No. 46 "On approval of professional standards in the field of healthcare."

5. Area of professional activity. Healthcare

6. Objects of professional activity. Medical organizations providing inpatient and outpatient care, healthcare systems of the Republic of Kazakhstan.

General information

№	Field names	Note
1	Registration number	7R09100164
2	Code classification about the field of education	7R01 Healthcare (Medicine)
3	Code classification of training areas	7R011 Healthcare
4	Group of educational programs	R020 Neurosurgery (adult, child)
5	Name of the educational program	7R01120 Neurosurgery (adult, child) (residency)
6	Type of EP	Updated EP
7	Level according to the international standard classification of education	7
8	Level according to the national qualifications framework	7
9	Level according to the industry qualifications framework	7
10	Distinctive features of the EP	No
11	List of competencies	**FC1** Patient supervision: able to formulate a clinical diagnosis, prescribe a treatment plan and evaluate its effectiveness based on evidence-based practice at all levels of medical care for patients with diseases of the nervous system.
		FC2 Communication and collaboration: able to effectively interact with the neurological patient, his environment, and healthcare professionals in order to achieve the best results for the patient
		FC3 Professionalism: Able to assess risks and use the most effective methods to ensure a high level of safety and quality of neurosurgical medical care.
		FC4 Public health: able to act within the legal and organizational framework of the healthcare

		system of the Republic of Kazakhstan in the specialty "Neurosurgery, (adult, pediatric)", provide basic care in emergency situations, work as part of interprofessional teams to implement policies to improve the health of the nation
		FC5 Research: able to formulate adequate research questions, critically evaluate professional literature, effectively use international databases in their daily activities, participate in the work of a research team
		FC6 Training and Development: Able to learn independently and train other members of the professional team, actively participate in discussions, conferences and other forms of continuing professional development in the field of neurosurgery.
12	Learning outcomes	LO1: Is able to formulate a clinical diagnosis, prescribe a treatment plan and assess its effectiveness based on evidence-based practice at all stages of neurosurgical care; LO2: Is able to effectively interact with the patient's relatives with healthcare professionals in order to achieve the best treatment results; LO3: Able to assess risks and use the most effective methods to ensure a high level of safety and quality of neurosurgical care; LO4: Able to act within the legal and organizational framework of the healthcare system of the Republic of Kazakhstan in the provision of neurosurgical care, provide basic assistance in emergency situations, work as part of interprofessional teams to implement public health promotion policies; LO5: Able to formulate adequate research questions, critically evaluate professional literature on neurosurgery, effectively use international databases in their daily activities, participate in the work of the research team; LO6: Able to study independently and train other members of the professional team of neurosurgeons, actively participate in discussions, conferences and other forms of continuous professional development.
13	Form of training	Full - time
14	Language of instruction	Kazakh and Russian
15	Volume of loans	280
16	Training period	4 years

17	Qualification awarded	Neurosurgeon (adult, child)
18	Availability of provisions for the license for the direction of personnel training	KZ 36LLA00011387
19	Availability of EP accreditation	yes
	Name of the accreditation organ	IAAR
	Validity period of accreditation	Certificate № AB 3513, 27.05.2021 - 26.05.2026
20	Information about disciplines	Appendix 1.2

Appendix 1.1

Matrix of correlation of learning outcomes according to the educational program as a whole with the competencies being formed

	LO1	LO2	LO3	LO4	LO5	LO6
C1	+	+	+			
C2		+		+		
C3			+		+	
C4				+		
C5					+	
C6						+

Appendix 1.2

Matrix of achievability of competencies/learning outcomes

№	Matrix of achievability of competencies/learning outcomes Name of the discipline	Short description	CYCLE (PD)	Component (MC, OC)	Number of credits.	Formed LO
1	Basics of neurosurgery	History of neurosurgery. Anatomy of the skull and its contents. Cranial nerves and their functions. Symptoms and clinic of brain damage. Possibilities of radiography and radiation diagnostic methods in neurosurgery. The degree of oppression of consciousness. Accesses in neurosurgery. Indications for surgery, intubation and mechanical ventilation. Complications in neurosurgery.	PD	MC	33	LO1 LO2 LO5

2	General Surgery	History of surgery and organization of surgical care. Asepsis and antiseptics. Pain relief. Emergency care for critical conditions of the body. Bleeding. Blood transfusion. Blood-substituting fluids. Surgical operation. Examination of a surgical patient. General questions of traumatology. Surgical infection (purulent-inflammatory diseases). Specific surgical infection. Insufficiency of blood and lymph circulation in the extremities. Tumors. Parasitic surgical diseases. Malformations of development. Plastic (reconstructive) surgery.	PD	MC	6	LO1 LO3 LO4
3	Vascular, including interventional angio-neurosurgery	Interventional angioneurosurgery. Clinical anatomy and physiology of the vascular system of the brain. Diagnosis, treatment and rehabilitation of vascular diseases of the brain: arterial aneurysms, vascular malformations, thromboembolism, acute disorders of cerebral circulation. Selection of laboratory and instrumental research methods and interpretation of results. Emergency conditions in angioneurosurgery and hospital care.	PD	MC	31	LO1 LO2 LO3
4	Neurophysiology and neuropathomorphology	Function of the nervous system and its structure. Neuroanatomy, neurobiologists I , neurEPsychologists, electrEPhysiologists I who study the brain. Functional organization of the nervous system, neural mechanisms of organization of reflex behavior and principles of system organization of brain functions. Surgical neurophysiology, electrophysiological examination of areas of the patient's nervous system. Neuromonitoring.	PD	MC	8	LO1 LO4 LO5
5	Functional and stereotactic neurosurgery	Indications for the use of functional and stereotactic methods of treatment in neurosurgery. Types of surgical treatment: EPen, punctured, and stereotactic. Treatment of muscular dystonia, pain syndromes, parkinsonism, hyperkinesis. Surgical treatment of epilepsy using functional and stereotactic neurosurgery. Neuroimplantations: blue	PD	MC	32	LO4 LO5 LO6

		brain stimulation, stimulation of the cerebral cortex, spinal cord.				
6	Neurosurgery of peripheral nerves	Comprehensive diagnosis of peripheral nerve pathology: surgery of the brachial plexus of nerves of the upper and lower extremities, tunnel syndromes, pain syndromes, peripheral nerve tumors. Indications for surgery. Methods of surgical intervention on peripheral nerves. Fundamentals of plastic surgery in closing extensive soft tissue defects extensive soft tissue defects.	PD	MC	30	LO4 LO5 LO6
7	Neurosurgery of traumatic brain injury	Biomechanics, structure, classification, pathomorphology, clinical forms, clinic and complex diagnostics of traumatic brain injury. Features of the course of traumatic brain injury in patients of various ages with concomitant diseases and exogenous intoxication. Indications for surgery. Conservative therapy. Prognosis and outcomes of traumatic brain injury	PD	MC	33	LO1 LO2 LO3
8	Spinal neurosurgery	Classification, pathomorphology, clinic and diagnosis of diseases and injuries of the spine and spinal cord. Biomechanics and types of injuries. Instrumental methods of examination. Indications for conservative and imperative treatment. Endoscopic operation's. Stabilizing operation's. Indications for repeated operation's. Complications.	PD	MC	33	LO1 LO2 LO4
9	Neuro-oncology, parasitic diseases and developmental disorders of the brain	Neurosurgery of a tumor. Brain tumors of various locations, histological structure, and degree of malignancy. Indications for surgical treatment of patients. Neuronavigation, neuromonitoring. Surgical access to tumors of various locations. Predoperative management of patients. Comprehensive treatment of tumors. Parasitic diseases and malformations of the brain in adults. Clinic, diagnosis, and combined treatment. Chemotherapy. Radiotherapy early neurorehabilitation. Medical examination of patients with tumor and parasitic diseases.	PD	MC	32	LO1 LO2 LO3

10	Pediatric neurosurgery	Clinical anatomy and physiology of the nervous system in children. Etiology, prevention, classification, clinical symptoms, differential diagnosis of neurosurgical pathology in children: congenital malformations of the brain and spinal cord, traumatic brain injury, vascular diseases, neuro-pathology and parasitic diseases of the central nervous system. Features of the clinical course of neurosurgical diseases in children. Algorithm for diagnosing neurosurgical pathology in children. Selection of laboratory and instrumental research methods in children with neurosurgical pathology and interpretation of the results. Indications for surgical treatment. Types and features of surgical interventions in children with various neurosurgical pathologies. Rehabilitation of children with congenital malformations of the central	PD	MC	24	LO4 LO5 LO6
11	Pediatric Surgery	The main surgical diseases of childhood. Clinical and instrumental methods of examination of children with surgical pathologies. Modern methods of surgical intervention. Management of patients in the postoperative period, taking into account individual and age characteristics.	PD	OC	4	LO1 LO2 LO4
12	Oncology in the hospital	Diagnostic capabilities in the use of morphological, immunological, genetic, and molecular biological techniques for the identification of CNS tumors. Advanced scientific achievements. Practical recommendations for the diagnosis and surgical treatment of tumor diseases. The use of the most modern drugs and modern methods of treatment.	PD	OC		LO2 LO3 LO4
13	Angiosurgery in the hospital	Clinical symptoms, treatment methods, and diagnostics of vascular diseases that occur in neurosurgical practice. Interventional medicine and infusion therapy in angiosurgery. Diagnosis and treatment of angiosurgery of diseases in children and pathologies of the cardiovascular system.	PD	OC	4	LO1 LO2 LO5
14	Methods of neuroimaging	Modern achievement of neuroimaging and functional diagnostics. Visualization of the structures, functions and biochemical	PD	OC		LO3 LO5 LO6

	and functional diagnostics	characteristics of the human body, especially the brain and spinal cord. Computed tomography, magnetic resonance imaging, echoencephaloscopy, methods of functional diagnostics (EEG, ENMG), evoked somatosensory potentials.				
15	Intensive care in surgical patients	Acute pathological conditions in surgical patients that require urgent diagnostic and therapeutic actions, taking into account age characteristics and the nature of the course of diseases. Therapeutic and diagnostic technologies used in patients with surgical diseases. Algorithms of actions of a resuscitator when collecting an anamnesis, clinical examination, and making tactical decisions in critical situations.	PD	OC	8	LO2 LO3 LO4
16	Neurology in the hospital	Basic information on general and private clinical neurology. Morphology and function of the nervous system, methods of examination of patients. Etiology, clinical manifestations of the nervous system. Fundamentals of rehabilitation measures and medical and social expertise.	PD	OC		LO1 LO2 LO3

The matrix of achievement of LO by various methods of training and assessment methods

The final results of the EP training	Assessment methods	Teaching and learning methods used
PO1Able to formulate a clinical diagnosis, prescribe a treatment plan and evaluate its effectiveness based on evidence-based practice at all levels of medical care for patients with neurological diseases.	Oral questioning, analysis of problems. Mini clinical exam. Checklist "Score 3600" for residents. Presentations.	CBL Literature review. Supervision of neurosurgical patients, work with medical documentation.
PO2 Able to effectively interact with the patient, his environment, healthcare professionals in order to achieve the best results for the patient.	Oral questioning, analysis of problems. Mini clinical exam. Checklist "Score 3600" for residents. Presentations.	CBL Literature review. Supervision of neurosurgical patients, work with medical documentation.
RO3 He is able to assess risks and use the most effective methods to ensure a high level of safety and quality of medical care for patients with disorders of the basic functions of the nervous system.	Oral questioning, analysis of problems. Mini clinical exam. Checklist "Score 3600" for residents. Presentations.	CBL Literature review. Supervision of neurosurgical patients, work with medical documentation.

RO4 Able to act within the legal and organizational framework of the healthcare system of the Republic of Kazakhstan in the specialty "Neurology, including children's", provide basic assistance in emergency situations, work as part of interprofessional teams to implement policies to improve the health of the nation.	Oral questioning, analysis of problems. Mini clinical exam. Checklist "Score 3600" for residents. Presentations.	CBL Literature review. Supervision of neurosurgical patients, work with medical documentation.
RO5 Able to formulate adequate research questions, critically evaluate professional neuroscience literature, effectively use international databases in their daily activities, and participate in the work of a research team.	Oral questioning, analysis of problems. Mini clinical exam. Checklist "Score 3600" for residents. Presentations. Portfolio	CBL Literature review. Supervision of neurosurgical patients, work with medical documentation.
RO6 Able to learn independently and teach other members of the professional team, actively participate in discussions, conferences and other forms of continuing professional development in the field of neurology.	Oral questioning, analysis of problems. Mini clinical exam. Checklist "Score 3600" for residents. Presentations. Portfolio	CBL Literature review. Supervision of neurosurgical patients, work with medical documentation.

Work plan for **the entire training period**

Residents' workplan for the 7R01120 «Neurosurgery (adult, child)» educational program for the 2022–2026 academic year.

Cycle lisciplin s/		Discipline code/	Name of the discipline/ modules/	Amount of credits	General hours	classr oom	RIC		1 year of study	2 year of study	The form contro l/	FE
							CPPH	RTIC/				
PD /			CYCLE OF PROFILING DISCIPLINES	138	4140							
			Mandatory component	134	4020							
PD /	UC /											
		R-NHA	Neurology in the hospital, adult	54	1620	324	1134	162	30	24	Exam	

		R-NHC	Neurology in the hospital,children	30	900	180	630	90	18	12	Exam	
		R-IRMN	Instrumental research methods in neurology	8	240	48	168	24	8		Exam	
		R-ECNN	Emergency conditions in neurology and neuroresuscitation	12	360	72	252	36		12	Exam	
		R-ACNA	Ambulatory-clinic neurology, adult	10	300	60	210	30		10	Exam	
		R-ACNC	Ambulatory-clinic neurology, children	6	180	36	126	18		6	Exam	
		R-NR	Neurorehabilitation	6	180	36	126	18	6		Exam	
		R-VRMN	Visualization research methods in neurology	8	240	48	168	24	8		Exam	
	TK/ KV / OC /	Optional component		4	120	24	84	12		4		
		R-CADDTSE	Current aspects of differential diagnosis, treatment and social rehabilitation in epilepsy/	4	120	24	84	12		4	Exam	

		R-PADCCDT	The problem of acute disorders of cerebral circulation: diagnosis, treatment/									
		R-GADNS	Geriatric aspects of diseases of the nervous system/									
		R-DPLES	Diseases with a predominant lesion of the extrapyramidal system									
		TOTAL		138	4140	828	2898	414				
IC		INTERMEDIATE CERTIFICATION										
FE		FINAL EXAMINATION		2	60					2		60
		TOTAL		140	4200	828	2898	414	70	70		60