

SPECIALITY TRAINING PROGRAM FOR NEUROSURGERY

Title of the residency study program	State code
NEUROSURGERY	733A30074

Academic awarding institution	Language
Lithuanian University of Health Sciences (LUHS), Medical Academy, Neurosurgery Clinic, A. Mickevičiaus g. 2, LT-44307 Kaunas, Lithuania	Lithuanian

Kind of studies	Cycle of studies	Level of qualification according to Lithuanian Qualification Structure (LKS)
University studies	Non-degree studies	7 th level cycle

Mode of the studies and length in years	Volume of the program in ECTS credits	Total amount of student work	Formal teaching and practice hours	Independent self-directed learning hours
Full-time studies, 5 years	330	8800	7506	

Area of studies	Main field of the study program	Parallel study program (if available)
Biomedical sciences	Medicine	-

Professional qualification awarded
Neurosurgeon

Study program director	Director's contact information
Professor dr. hab. Arimantas Tamašauskas	Office tel.: +370 37 326472; mobile: +370-698 52429 E-mail: arimantas.tamasauskas@kaunoklinikos.lt

Institution of accreditation	Accreditation until
Centre for Quality Assessment in Higher Education	Year 2014

Aim of the residency study program
<p>The Neurosurgery Residency Programme provides speciality training in Neurosurgery leading to acquiring professional qualifications of a neurosurgeon, with the necessary competence and skills to provide services in all areas of neurosurgery and to apply preventive approaches in accordance with the Lithuanian Medicine Norm for neurosurgeons: plan, organize and perform actions essential for specialised neurosurgical services; able to apply theory and evidence based concepts to daily neurosurgical practice: diagnosis, treatment prevention, and rehabilitation; committed to self-directed learning and professional development.</p>

Program profile		
Disciplines/subject areas	Orientation of the program	Distinctive features of the residency study program
<p>The Programme includes obligatory and optional courses encompassing theoretical approaches, practical work, and independent work. Obligatory courses, are focused on advancing knowledge, competences and skills in general surgery to provide neurosurgery residents with the background knowledge of general surgery; Neurology and Paediatric Neurology with the specific emphasis on neurological patient examination,</p>	<p>The Neurosurgery Residency Programme is of applied studies type university programme oriented toward practical work, fostering universal human values, developing research skills, and leading to the earning of the professional qualification of a neurosurgeon. Following successful completion, the graduates are able to manage and</p>	<p>The Programme is designed in accordance with the national legislation; the Council of Europe Directive 93/16/EEC of April 5, 1993 to facilitate the free movement of doctors and the mutual recognition of their diplomas, certificates and other evidence of formal qualifications; Directive 2005/36/EC of the European Parliament and the Council of September 2005 on the recognition of professional qualifications; Cumming AD, Ross MT. The Tuning Project (medicine) – “Learning Outcomes / Competences for Undergraduate Medical Education in Europe.” Edinburgh: The University of Edinburgh,</p>

<p>interpretation of neurophysiological data, diagnostics and differential diagnostics of neurological diseases and methods of treatment; in Neurosurgical Pathology, the emphasis is on etiopathogenesis, diagnostics and differential diagnostics, modern methods of diagnostics, indications for and value of specific methods, indications and methods of surgical and conservative treatment, principles and specificity of neurosurgical operations, pre- and post-operative treatment principles, features of neurosurgery patient care, indications for neurorehabilitation treatment, and the structure of the neurosurgical services in Lithuania; diagnostics and principles of intensive therapy of neurosurgical critical states in intensive therapy area. There are obligatory courses devoted to the study of radiology in neurosurgery to instruct on the main diagnostic criteria for neurosurgical diseases; Anaesthesiology in Neurosurgery focuses on the main principles of preparing neurosurgical patients for surgery and invasive procedures; neuropathology introduces to possibilities and principles of pathological investigations of neurosurgical diseases; Otorinolaringology for Neurosurgeons includes the study of the main principles and possibilities for the investigation of structures neighbouring the brain, cervical part of the vertebra, and skull basis; Nervous System Diseases is intended for the study of the research in the field, the methodologies, and neuro-oncogenetics.</p> <p>The optional course “Modern Technologies in Neurosurgery” is intended to enhance acquisition of knowledge and skills regarding the use of complex modern technologies used in neurosurgery which are indispensable in everyday neurosurgical practice.</p>	<p>process information, demonstrate a broad knowledge base in the field, have good research skills, are capable of conducting and organizing research as well as obtaining data, and have good communication skills.</p>	<p>2008. Online at: http://www.tuning-medicine.com; “Degree Programme Development” (Bulajeva T., Lepaitė D., Šileikaitė-Kaishauri D., Vilnius, 2012: 40) (developed within the framework of the project “Development of the Concept of the European Credit Transfer and Accumulation System (ECTS) at the National Level: Harmonization of the Credit and Implementation of the Learning Outcomes Based Study Programme Design” (Nr. VP1-2.2-ŠMM-08-V-01-001); Decree of the Minister of Health Care of the Republic of Lithuania No. 58 of February 1, 2000 “On the Confirmation of the Lithuanian Medical Norm MN 79:2000” “Doctor Neurosurgeon. Rights, Responsibilities, Competences, and Liability”; Steers J., Reulen H.-J., Lindsay K.W. UEMS “Charter on Training of Medical Specialists in the EU. The New Neurosurgical Training Charter.” <i>Acta Neurochir</i> (2004) [suppl.] 90:3-11; “Training in Neurosurgery in the Countries of the EU. A Guide to Organize a Training Programme.” H.-J. Reulen (ed) 2004 Springer Verlag/Wien.</p> <p>The Programme is based on the integration of theoretical and practical knowledge. The theoretical knowledge and the practical skills are acquired under the guidance and mentorship of the residency programme University teaching staff. The training occurs at the Neurosurgery Clinic, Lithuanian University of Health Sciences, Medical Academy, and the accredited base for the Neurosurgery residency programme. The training in specific Programme subjects occurs in other specialized clinics of the University: the training in Neurology and Paediatric Neurology is located in the Clinic of Neurology; Otorinolaringology for neurosurgeons occurs in the Otorinolaringology Clinic; Neuropathology is located in the Neuropathology Clinic the Radiology in Neurosurgery is in the Clinic of Radiology; Intensive Therapy of Neurosurgical Critical States occurs in the Neurosurgical Intensive Care Unit; Anaesthesiology in Neurosurgery is in The Clinic of Anaesthesiology and the Neurosurgery operating rooms. Nervous System Diseases and Research is in the Laboratory of Neurooncology and Genetics. Research skills are fostered in the module Nervous System Diseases and Research located in the Laboratory of Neurooncology and Genetics just as in the course of the whole of residency training through engagement in research in the Neurosurgery Clinic.</p>
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Admission requirements	Recognition of previous learning
<p>Master’s degree in medicine and medical doctor professional qualification are obligatory along with a valid medical practice permit within the doctor’s scope of practice.</p>	<p>Credits from previous education are assessed on an individual basis in accordance with the requirements set by the LUHS Senate and with regard to the correspondence between the acquired competences</p>

<p>Admission is on a competitive basis; the composite admission index structure is outlined in the LUHS regulations for admission into residency programmes which are annually approved by the University Senate and submitted for approval to the Ministry of Education and Science of Lithuania. The main parts of the index combine grade-point average, final examination grade, clinical medicine practice assessment (first residency cycle, internship), research work assessment (provided by the Student Research Association), and motivation interview assessment. Motivation interview takes place according to a preset schedule. Admissions committee includes members of the academic staff of the Neurosurgery Clinic and a resident representative. Candidates are assessed on the basis of research in the field of neurosurgery, voluntary clinical work in neurosurgical departments, and personal qualities. Personal statement addressed to the admissions committee is presented on the day of the motivation interview. The competition is open; and takes place separately to every residential study program in two stages (main and supplementary). Supplementary admissions can be announced if after the main admission free places are still available. Information on admissions is available on the university website: (www.lsmuni.lt/priemimas).</p>	<p>and the learning outcomes of the previous study programme and the contents of the residency study programme “Neurosurgery.”</p>
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Access to further education

Access to professional activities (employability)
<p>A neurosurgeon can work in a variety of practice settings both in state health care institutions and in private practices which are granted the right to provide neurosurgical services. Licence to practice neurosurgery is granted by the State Health Care Accreditation Agency under the Ministry of Health Care of the Republic of Lithuania upon submission of the diploma and the internship and residency completion certificates. Qualifications in neurosurgery also open an access to research and a career within the academia. The residency completion certificate and the granted professional qualifications are recognized within the EU. All of the Neurosurgery residency graduates are in work. The Neurosurgery residency programme accepts a limited number of graduates per year with respect to market demand and employee turnover; thus, the likelihood of employment remains high.</p>

Learning and teaching approaches	Methods of assessment (of learning achievements)
<p>Clinical work in the Departments of the Neurosurgery Clinic and the operating rooms; Lectures; Seminars; Consultations; Group-work; Patient care under the supervision of a resident supervisor / module curator; Consultations on patients in all departments of the hospital under the supervision of the resident supervisor / module curator; Participation in work rounds, daily attending rounds on the ward, grand rounds, doctor meetings, clinical conferences, and journal clubs; Independent self-directed learning of study subjects of the Programme subjects.</p>	<p>In the completion stage, theoretical knowledge and practical skills of neurosurgery residents are assessed on the basis of their performance in examining a patient, evaluating, and developing a differential diagnosis; and formulating a treatment plan.</p> <p>Practical skills are assessed in regards to the demonstrated procedural skills, surgical skills in performing the entire or part of a surgical procedure, and the ability to assist in surgery.</p> <p>Attendance by 75% on all the topics covered during theoretical classes is compulsory.</p>
<p>Skills and competences are acquired via consultation and examination of patients in the out-patient department of the Nervous System, emergency and paediatric departments, intensive care and other in-patient units of (LUHS), Kaunas Clinics; taking part in daily and department/clinic rounds; preparing/taking part in presentation of cases; involvement in the care of</p>	<p>Continuous assessment on log books and performance on delegated tasks by a resident supervisor; case study analysis during daily attending rounds and grand rounds;</p> <p>Practical knowledge and skills are assessed with regard to the abilities demonstrated in the assessment and management of clinical cases and the number of interventions indicated in log books, the validity of</p>

<p>neurosurgical and neurological in-patient care during respective study cycles; taking part in operations of neurosurgical patients, and being on clinical service under the supervision of the resident supervisor, module curator, or attending licensed neurosurgeon during duty hours.</p>	<p>which is confirmed by the resident supervisor;</p> <p>Practical and theoretical knowledge and skills are graded on ten-point scale and recorded in the log book and resident's record book.</p> <p>Participation in the journal club and presentation of relevant bibliography based cases at grand rounds/conferences, and other events are registered in log books and confirmed by the resident supervisor;</p> <p>In the course of Neurosurgery residency, residents conduct research of their own choice. The topic is coordinated with the resident supervisor; the second year of the residency marks the beginning of focused research to be continued for four years.</p> <p>Activities categorized as research are scholarly publications; conference presentations; attendance of lectures and seminars for professional development. During the study period, residents publish two articles on neurosurgical topics in recognized local or international scholarly journals and present two papers on neurosurgical topics at local or international conferences.</p> <p>Final exam of Neurosurgery residency consists of three parts: written, clinical, and oral. The exam takes place for two days. The written exam, which can be taken after the fourth year of the neurosurgery residency, consists of two parts: the first tests on neurosurgical topographic anatomy; the second covers etiopathogenesis, diagnostics and treatment of neurosurgical diseases. The clinical part assesses on residents' clinical capacities: it includes an examination of two clinical cases. The oral part is structured as a discussion on surgical pathological anatomy and histology; neurosurgical treatment plans and procedures; reasoning behind neurosurgical decisions, and other questions.</p>
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General competencies (knowledge, abilities, values and attitudes)		Outcomes (results) of residency study program	
1.	Professional attributes	1.1	Be honest and respectful in the professional capacity and while dealing with patients and their family/close contacts; comply with the ethical standards of medicine and requirements for good medical practice; give and receive criticism in an objective and constructive manner; provide supportive and compassionate care to patients; be creative and willing to take initiative.
2.	Work activities	2.1	Demonstrate ability to recognize one's capabilities and limitations pertaining to neurosurgical and related medical knowledge; ask for help when needed; be able to deal with urgent neurosurgical situations; demonstrate ability to act independently; know how to plan and manage treatment; be able to manage time effectively; display good problem solving abilities; be able to take decisions and work in a cooperative manner with colleagues and other medical professionals.

3.	Professional qualifications	3.1.	Be able to recognize and analyse nervous system diseases that require neurosurgical treatment; generate differential diagnosis, apply theoretical knowledge usefully in practice; be able to share information and pass knowledge and skills to others; continually expand medical knowledge by studying recent developments in practice and research.
		3.2.	Provide patients and their families with thorough information to guide them through situations related to rehabilitation; documenting a disability; seeking social or psychological help.
		3.3.	Be able to deal with ethical and legal issues of neurosurgical diseases.
		3.4.	Plan and conduct scientific research; publicise its results; work in collaboration with colleagues from home country and abroad.

Subject-specific competences (knowledge, abilities, values and attitudes)		
4.	Neurosurgical examination	<p>4.1. Be able to identify and interpret symptoms of neurosurgical diseases.</p> <p>4.2. Be able to evaluate a patient's state and level of consciousness; identify and interpret specific pathological symptoms of nervous system diseases that require neurosurgical treatment.</p> <p>4.3. Be able to take a thorough history of neurosurgical disease(s) and to interpret it.</p> <p>4.4. Be able to perform an appropriate neurological-neurosurgical examination in patients of any age group (adults, children, infants, new-born) and unconscious patients.</p> <p>4.5. Be able to explain to patients and/or their parents/family/close contacts the treatment plan and its aims; reassure and encourage them. Be able to formulate preliminary neurosurgical diagnosis.</p> <p>4.6.</p>

5.	Developing Diagnostic and treatment plan for neurosurgical patients	5.1	Demonstrate understanding of the main principles of generating diagnosis and developing differential diagnosis for nervous system diseases (the main brain vessels, degenerative, demyelinating and neuromuscular diseases, epilepsy and peripheral nerves pathology); and formulation of diagnosis.
		5.2	Be able to recognize and interpret symptoms of neurosurgical diseases that require neurosurgical treatment and assess their complexity; develop primary (complaint-focused examination of a patient, history taking, and relevant examination) and secondary (interpretation of previous examination and planning/interpreting subsequent examination results) differential diagnosis of the suspected disease.
		5.3	Be able to formulate a diagnostic plan (necessary and anticipated diagnostic procedures) and to interpret diagnostic data.
		5.4	Be able to determine indications for the surgical and/or non-surgical treatment of a specific pathology.
		5.5	Be able to formulate a treatment and supportive care plan to match the needs of a particular patient, discuss it with the patient and their family/close contacts, and assess the potential risks and benefits of the medication, interventions and the administered treatment; to plan palliative care.
		5.6	Communicate with patients in critical states and critically ill patients and their families/close contacts; demonstrate the ability to elicit the patient's confidence and cooperation; to convince the patient's or their family/close contacts to sign consent for diagnostic or surgical procedures; have the skills to handle aggressive patients; handle conflicts with patients and their family/close contacts constructively.

6.	First aid and emergency treatment	6.1	Demonstrate ability to recognize acute neurological states (disturbances of consciousness, acute breathing failure of neurological origin, acute myelopathy syndrome, and severe pain, acute disturbances of cerebrovascular blood circulation, status epilepticus, myastenic crisis, meningitis, and encephalitis).
		6.2	Be able to recognise neurosurgical conditions that require emergency medical treatment (acute compression of brain and spinal cord, brain herniation, brain oedema, obstruction of CSF pathway circulation, acute intracranial (postoperative) bleeding, haemorrhage into brain tumour, cervical spinal cord injury, spinal shock); provide first aid, provide intensive care according to valid recommendations, to provide first aid and emergency treatment for trauma patients and organize further diagnostic and treatment procedures of neurosurgical patients.
		6.3	Be familiar with the principles of diagnostics and treatment of critical states in neurosurgical patients; be able to provide relevant care in cases of changes in the patient's condition and unforeseen complications: be familiar with maintenance of homeostasis, management of different kinds of shock, the principles of treatment of critical states in head and spinal trauma and multiple trauma patients, the principles of brain oedema treatment, prevention and treatment of neuroinfections, and indications for early tracheostomy.

7.	Performing neurosurgical and diagnostic procedures and interpretation of the results	<p>7.1. Be familiar with the main principles of surgical work: to know the main groups of the surgical instruments and their implementation, to be able to handle tissues appropriately, to know suture and knot tying techniques, manage bleeding, to know how to perform biopsy of superficial soft tissues and lymph nodes.</p> <p>7.2. Be able to identify indications for diagnostic tests or procedures and to be able to provide their evaluation: head, spine, CNS and peripheral nerves radiological investigations (craniography, spondylography, CT, MRI, neurosonography, CT angiography, MR angiography, MR angiography, cerebral angiography, myelography, CT myelography, ventriculography, SPECT, BERA, visually evoked potentials, somatosensory evoked potentials, EEG, EMG, TCD, duplex sonography, neuroophthomological and</p> <p>7.3. otoneurological examination. Be able to recognize and differentiate disturbances of consciousness, to determine level of consciousness; to assess patient's state according to NIHSS scale and identify patients after ischemic stroke for thrombolysis; to differentiate between acute neurological states and other acute somatic states on the basis of diagnostic and laboratory results.</p> <p>7.4. Be able to perform lumbar puncture, ventricular puncture via fontanel, subcutaneous CSF fluid reservoir puncture, adjustment of pressure threshold in programmable shunt valves; be able to inject medication intraventricularly and intrathecally;</p> <p>7.5. Be able to perform intraoperative cranial nerve monitoring, use neuronavigation, intraoperative brain sonography; be able to use intraoperative CT and MRI;</p> <p>7.6. Know how to place stereotactic frame, to achieve high degree of accuracy in localizing intracranial targets using CT or MRI;</p> <p>7.7. Be able to perform selective nerve root block; be able to perform myelography and CT myelography working with a radiologist.</p> <p>7.8. Be familiar with the principles of the patient's preparation for anaesthesia and surgery; to know the main methods of anaesthesia; to know the main principles of monitoring of vital functions;</p> <p>7.9. Be familiar with the principles of examination of acoustic and vestibular, olfactory, facial nerve, nasopharyngeal, and oropharyngeal function; know the indications for diagnostic examination and be able to interpret diagnostic data.</p> <p>7.10. Be familiar with the principles of neuropathological cytological, histological, morphological and imunohistological examination and data interpretation; know the histological WHO classification of CNS tumours and degrees of malignancy.</p> <p>7.11. Be familiar with scientific research methodologies in biomedicine; be aware of principles of neurooncogenetics, principles of research and their application; know CNS genetic and epigenetic changes and molecular biology of CNS tumours and markers.</p>
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9.	Prognosis and further treatment	9.1. 9.2. 9.3.	Demonstrate ability to predict neurosurgical outcomes, to coordinate supplementary surgical treatment in case of complications; coordinate the relevant adjuvant therapy for neurooncological patients.
10	Health promotion and disease prevention	10.1 10.2	Be able to assess risk for patient's health and apply proper and relevant measures to lower risk levels; take measures to prevent complications and postoperative infections; assess the environment and lifestyle health risks and take preventive measures; Promote successful cooperation of the patient-close contacts and other health care personnel to maintain health and avoid complications.