



Medicinska fakulteta

UČNI NAČRT PREDMETA / SUBJECT SPECIFICATION

Predmet:	Nevrokirurgija
Subject Title:	Neurosurgery

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Splošna medicina General medicine - EMŠP		5	9

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Klin. vaje Clin work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
15	45		0		60	4

Nosilec predmeta / Lecturer:

Doc. dr. Janez Ravnik

Jeziki /

Predavanja / Lecture:

Slovenski/slovene

Languages:

Vaje / Tutorial:

Slovenski/slovene

Pogoji za vključitev v delo oz. za opravljanje

Prerequisites:

študijskih obveznosti:

Vsebina:

Content (Syllabus outline):

- Predstavitev nevrokirurgije, kratek zgodovinski pregled
- Kirurška anatomija možganov
- Nevroni in nevroglia
- Glavne preiskovalne metode v nevrokirurgiji
- Razvojne nepravilnosti osrednjega živčevja (hidrocefalus, kraniosinostoza, encefalokela, mielomeningokela, Arnold-Chiaryjev sindrom, Dandy-Walkerjev sindrom)
- Poškodbe glave in možganov (zlomi lobanjskega svoda in lobanjske baze, intrakranialni hematomi, strelne poškodbe, poškodbe glave in možganov pri otrocih, zdravljenje možganskega edema, prognoza bolnikov s poškodbo glave in možganov)
- Tumorji osrednjega živčnega sistema (WHO klasifikacija tumorjev osrednjega živčevja, biologija in imunologija možganskih tumorjev, intrinzični tumorji, ekstrinzični tumorji, ventrikularni in bazalni tumorji, tumorji hrbtnjenjače)
- Žilne bolezni (spontane možganske krvavitve, subarahnoidna krvavitve, možganske anevrizme, arteriovenske malformacije, kavernomi, spinalne arteriovenske malformacije)
- Okužbe v živčnem sistemu (možganski absces, meningitis, ventrikulitis, okužbe drenažnih sistemov, subduralni empijem,

- Introduction to neurosurgery and short historical review
- Surgical Anatomy of the Brain.
- Neurons and Neuroglia.
- Main diagnostic procedures in neurosurgery.
- Developmental and Acquired anomalies: Hydrocephalus, Craniosynostosis, Encephaloceles, Myelomeningocele, Arnold-Chiary and Dandy Walker syndrome...
- Head and Brain Trauma: fractures of the skull and skull base, intracranial haematomas, penetrated injuries, peculiarities of brain trauma in children, treatment of brain oedema and prognostic factors in brain trauma.
- Brain Tumours: WHO classification, Basic science of Neuro-oncology, Intrinsic Tumours, Extrinsic Tumours, Ventricular and Skull Base Tumours, Spinal Cord Tumours.
- Vascular diseases: Intracerebral Haemorrhage, Aneurysms, Arteriovenous Malformations, Cavernous Malformations, Spinal Arteriovenous Malformations.
- Infections: Cerebral Abscess, Meningitis, Ventriculitis, Shunt Infection, Subdural Empyema, Spine Infections.
- Approach to the Patient and Medical Management of Spinal Disorders: Intervertebral Disc Herniation, Spinal

hrbtenične okužbe) - Degenerativne bolezni hrbtenice (kila medvretenčne ploščice, spinalna stenoza, spinalna nestabilnost) - Poškodbe perifernega živčevja, kompresijske in utesnitvene nevropatije - Funkcionalna in stereotaktična nevrokirurgija (kirurško zdravljenje Parkinsonove bolezni, spastičnosti, spastičnega tortikolisa, tremorja) - Nevrokirurško zdravljenje bolečine (balonska kompresija ganglijev, mikrovaskularna dekompresija, vstavitve stimulatorjev in črpalk) - Osnove stereotaktične radiokirurgije (LINAC, gama nož) - Operacije in posegi v nevrokirurgiji	Stenosis, Spondylolisthesis. - Management of Peripheral Nerve Injuries - Functional and Stereotactic Neurosurgery: Movement Disorders, Spasticity. - Surgical Treatment of Pain - Stereotactic Radiosurgery (LINAC, Gamma knife) - Operations and Procedures in Neurosurgery
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Temeljni literatura in viri / Textbooks:

- Strojnik T (ur.). Izbrana poglavja iz nevrokirurgije. 1 izd. Maribor. Medicinska fakulteta, 2010.
- Greenberg MS. Handbook of Neurosurgery. New York: Thieme Medical Pub, 7 ed., 2010.
- Hayden Gephart, Tarascon Neurosurgery Pocketbook. Burlington; Jones&Bartlett Learning, 2014

Cilji:

Slušateljcem bomo predstavili sodobno nevrokirurško prakso. Pri pouku bomo z njimi razpravljali o glavnih diagnostičnih postopkih, patofiziologiji in konzervativnem oz. kirurškem zdravljenju pogostih nevrokirurških stanj. Poudarek bo na reševanju ilustrativnih kliničnih primerov, z namenom, da slušatelji osvojijo znanje o pravočasnem prepoznavanju in napotitvi potencialnega nevrokirurškega bolnika na zdravljenje. Prav tako bomo slušatelje seznanili s posebnostmi ambulantnega vodenja nevrokirurških bolnikov in jih naučili prepoznavati in ukrepati ob morebitnih zapletih. Poseben poudarek, zlasti na vajah, bo na prepoznavanju in ukrepanju pri nujnih nevrokirurških stanjih. Ob delu s slušatelji nam bo osnovno vodilo to, da osvojijo zmožnost kritičnega mišljenja in logičnega razmišljanja.

Predvideni študijski rezultati:**Znanje in razumevanje:**

Študent medicine mora iz literature ali opisa spoznati in uvrstiti klinično sliko bolečine, razvojnih nepravilnosti, tumorjev baze lobanje, žilne nepravilnosti, da si lahko poišče dodatne informacije. Študent medicine mora poleg znanja opisanega zgoraj tudi znati obravnavati bolnika z intrinzičnimi in ekstrinzičnimi možganskimi tumorji, poškodbo možganov in degenerativnimi obolenji hrbtenice (za to klinično sliko pozna simptome, znake, postopek diagnoze in diferencialne diagnoze ter splošna načela zdravljenja).

Objectives:

Contemporary neurosurgical praxis will be presented to our students. During the lessons main diagnostic procedures, pathophysiology and treatment options of common neurosurgical problems will be discussed. We will mainly focus on illustrative clinical cases with purpose that our students will be able to timely recognize common neurosurgical conditions that require neurosurgical treatment. Characteristics of neurosurgical outpatients' department work as well as dealing with neurosurgical complications will also be discussed. Special attention especially during practical work will be given to common neurosurgical urgencies. Our main guidance during our work with the students will be that they conquer the ability for logical and critical thinking

Intended learning outcomes:**Knowledge and Understanding:**

Medical student should be able to recognize clinical picture of typical pain syndromes, developmental and acquired anomalies, skull base tumours, vascular abnormalities, so that he/she can find additional information's. Beside this student should be able to deal with the patients with intrinsic and extrinsic brain tumours, brain injury, and degenerative spine diseases. Student should be familiar with clinical picture, symptoms and signs, diagnostic procedures, differential diagnosis and treatment options.

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Prenesljive/ključne spretnosti in drugi atributi:
Slušatelji naj osvojijo znanje o pravočasnem prepoznavanju in napotitvi potencialnega nevrokirurškega bolnika na zdravljenje. Prav tako bomo slušatelje seznanili s posebnostmi ambulantnega vodenja nevrokirurških bolnikov in jih naučili prepoznavati in ukrepati ob morebitnih zapletih.

Transferable/Key Skills and other attributes:
Students should be able to timely recognize common neurosurgical conditions that require neurosurgical treatment. Characteristics of neurosurgical outpatients' department work as well as dealing with neurosurgical complications will also be discussed.

Metode poučevanja in učenja:

Learning and teaching methods:

Predavanja, seminarji, opazovanje operativnih posegov po dogovoru.

Lectures, seminars, observation of common neurosurgical procedures upon request.

Načini ocenjevanja:

Delež (v %) /
Weight (in %)

Assessment:

Opravljen seminar in vsaj 80% prisotnost na seminarjih je pogoj za pristop k izpitu.

Pogoj za pristop

Completed seminar and at least 80% attendance at seminars is a prerequisite for the exam.

Pisni izpit - vprašanja izbirnega tipa in esejska vprašanja.

100 %

Written exam - multiple choice and essay type questions.

ŠTUDIJSKE OBVEZNOSTI ŠTUDENTOV
80% prisotnost pri seminarjih (vsaj pri 12 seminarjih od skupno 15) in vsaj 50% udeležba na predavanjih (vsaj pri 4 od skupno 8). Udeležba se preverja s podpisi.

ACADEMIC OBLIGATIONS OF STUDENTS:
80% attendance at seminars (at least 12 out of 15) and 50% attendance at lectures (at least 4 out of 8). Participation will be verified by the signatures.

POGOJI ZA PRISTOP K POSAMEZNEMU PREVERJANJU ZNANJA
Prisotnost pri seminarjih (vsaj pri 12 seminarjih od skupno 15) in predavanjih (vsaj pri 4 od skupno 8).
Opravljen praktični del izpita v sklopu seminarja.

REQUIREMENTS FOR ACCESS TO INDIVIDUAL KNOWLEDGE CHECKING:
80% attendance at seminars (at least 12 out of 15) and 50% attendance at lectures (at least 4 out of 8).
Passed practical examination at seminars.

Reference nosilca / Lecturer's references:

1. Ravnik J, Smigoc T, Bunc G, Lanisnik B, Ksela U, Ravnik M, Velnar T. Hypophyseal metastases: A report of three cases and literature review. *Neurol Neurochir Pol* 2016;50:511-516.
2. Snyderman CH, Gardner PA, Lanisnik B, Ravnik J. Surgical telemonitoring: A new model for surgical training. *Laryngoscope* 2016;126:1334-8.
3. Bunc G, Ravnik J, Vorsic M, Seruga T, Jevsek M, Smigoc T, Velnar T. Endovascular versus operative treatment of cerebral aneurysms: a comparison of results from a low-volume neurosurgical centre. *Wien Klin Wochenschr* 2016;128:354-9.
4. Ravnik J, Ravnik M, Bunc G, Glumbic I, Tobi-Veres E, Velnar T. Metastasis of an occult pulmonary carcinoma into meningeoma: a case report. *World J Surg Oncol* 2015;13:292
5. Bunc G, Ravnik J, Ravnik M, Velnar T. Partial skull base tumour resection in combination with radiosurgery: an escape procedure or a reasonable solution of treatment? *Wien Klin Wochenschr* 2015;30: Epub ahead of print
6. Ravnik J, Bunc G, Grcar A, Zunic M, Velnar T. Colloid cysts of the third ventricle exhibit various clinical presentation: a review of three cases. *Bosn J Basic Med Sci* 2014;14:132-5
7. Velnar T, Ravnik J, Bunc G. Resolution of blepharospasm after chronic subdural haematoma evacuation: A case report. *Wien Klin Wochenschr* 2012;124:204-6
8. Bunc G, Vorsic M, Ravnik J, Velnar T. Proximal migration of a lumboperitoneal shunt into the prepontine and ambiens cisterns. *Clin Neurol Neurosurg* 2011;113:75-7
9. Bunc G, Ravnik J, Vorsic M, Ravnik M. Variable presentations of Currarino syndrome in three members of the same family. *Acta Neurochir (Wien)* 2009;151:1169-73
10. Ravnik J, Potrc S, Kavalarič R, Ravnik M, Zakotnik B, Bunc G. Dumbbell synovial sarcoma of the

thoracolumbar spine: a case report. *Spine (Phila Pa 1976)* 2009;34:363-6

11. Bunc G, Ravnik J, Seruga T. Treatment of ruptured intracranial aneurysms: report from a low-volume center. *Wien Klin Wochenschr* 2006;118 Suppl 2:6-11
12. Kovacic S, Bunc G, Ravnik J. Correspondence between the time course of cerebral vasospasm and the level of cerebral dopamine-beta-hydroxylase in rabbits. *Auton Neurosci* 2006;130:28-31
13. Ravnik J, Starovasnik B, Sesok S, Pirtosek Z, Svigelj V, Bunc G, Bosnjak R. Long-term cognitive deficits in patients with good outcomes after aneurysmal subarachnoid hemorrhage from anterior communicating artery. *Croat Med J* 2006;47:253-63
14. Bosnjak R, Derham C, Popović M, Ravnik J. Spontaneous intracranial meningioma bleeding: clinicopathological features and outcome. *J Neurosurg* 2005;103:473-84.