Course: Neurosurgery
Department: Department of Neurosurgery
Study program: Integrated Undergraduate and Graduate University Study of Medicine in English
Study year: 5th
Academic year: 2021/2022

SYLLABUS

COURSE DESCRIPTION:

The course in **Neurosurgery** is obligatory course during the fifth year of the medical studies, consisting of 8 hours of lectures, 4 hours of seminars and 8 hours of clinical practice, which is total of 20 hours (**1 ECTS**). It is performed in the wards of Clinic of Neurosurgery, Clincial Hospital Center Rijeka, in it's operation theaters, and in the Lecture hall of Clinical Hospital Center Rijeka (Sušak).

The aim of the course for the students is to adopt basic knowledge and skills in the neurosurgery and neurotraumatology. After getting information about specifical neurosurgical approach to neurolgical diseases and neurotraumatological cases, the student will learn about advisable operative ways of their treatment.

The contents are a part of neurological contents that are already known to the students from the fourth year and represent its logical continuation offering modern methods of operative treatment. The importance of the decompressive and pathologic substrate ablation is stressed: be it a tumour, haematoma o malformmation. Also, operations of the CSL derivation are shown, as well as the decompression of the spinal channel. A short description of the surgery of the inflammatory and purulent processes, and modern microsurgical methods, ventriculoscopy, endoscopy and minimally invasive procedures will be given. In neurotraumatology the explanation of the common injuries to the neurocranium and spine, as well as to the brain and spinal cord and peripheral nerves will be given. The importance of the team approach in their modern complex treatment is explained (the teams consisting of the urgnet medicine physician, intensive care unit – anesthesiologists and neurosurgeons and neurorehabilitationists is stressed.
Upon completing the course studnet will be able to aproach these patients with comprehension, be able to distinguish their ilness, analyse symptoms and recommend best diagnostic and treatment options. The student will be able to do the follow up of such patient and recognize qualitative and quantitative disturbances of the conciousness, focal neurological deficits (such as monoparesis vs hemiparesis, aphasia, gait and coordination disturbances etc.), recognize the signs of elevated ICP, neurlogical signs in sponal cord injuries (para- and tetraplegia).

Literature:

1. A comprehensive script representing lectures will be issued
2. Fundamentals of Neurosurgery, A Guide for Clinicians and Medical Students; A.F Joaquim, E. Ghizoni, H. Tedeschi, M.A.T. Ferreira – editors; Springer V. 2019.

COURSE TEACHING PLAN:

The list of lectures (with topics and descriptions):

L1
Introduction – what is Central Nervous System – how to treat it surgically

Historical development of Neurosurgery (NS)
Learning outcomes: to become familiar with the historical development of the neurosurgry, laern its subspecialties, become motivated in active taking part in the learning process.

L2
Patophysiology of the elevated Intracranial Pressure (ICP) – External CSL drainage
Learning outcomes: to unerstand what ICP is and about the basic patophyisiology of the elevated ICP. The stdent will know in what ways the CSL can be derived and how to recognize and follow these patients.

L3
Spinal neurosurgery – degenerative spine
Learning outcomes: understand what discal hernia is, become able to indicate the best diagnostic methods and advice teh treatment options – both for cervical, thoracic and lumbar spine.

L4
Pediatric neurosurgery
Learnng outcomes: to be able to describe and recognize common congenital malformations, especially to be able to recognize early signs of conatal hydrocephalus and its treatment. The student will also be informed about the common tumours in childhood.

L5
Tumors of the brain and spine – principles of diagnostic, operative indications, basic operative techniques.
Learning outcomes: the student will know whcih tumours are benign and malignant and their characteristics, will be familiar with the WHO grading – get the basic knowledge of the meningiomas, gliomas and metastatic brain tumours.

L6
Neurotraumatology – head injuries
Learning outcomes: to accept most important principle of ultimate urgency in the treatment of the severe head injuries; the student will be able to recognize the mild, moderate and severe head injury. The student will be able to understand and urgently react in treating the acute elevation of the ICP.

L7
Neurotraumatology – spine injuries
Learning outcomes: after completing the learning process the student will know the specifics in such injuries – stability of the spinal column, the neurological lesions and the principles of the treatment – decompression and stabilisation of the spine.

L8
Vascular neurosurgery – intracranial aneurysms
Learning outcomes: to differentiate arterial and veonous lesions; know where the most typical aneurisms are and what their symptoms are; know basic types of therapy – clipping, wrapping and coiling the aneurisms.

Seminars:

- seminars in Neurosurgery will follow the theoretical knowledge adopted during lectures and the students will get the chance to discuss the themes given.

Practicals:

Practicals will follow the theoretical knowledge from the lectures and seminars according also to the clinical material (patients) available in the opeating programme the specific day and the patients treated in the wards. Each student will be offered during the eight hours (the whole clinical day the possibility to take part in all the clinical work of the neurosurgeon.
The students are expected to adopt competencies which allow them to start their practice in general medicine – to be able to recognize neurosurgical patients and accordingly indicate their neurosurgical treatment. Each group of the students will consist of 4 students.

The student obligations:

The student has to follow all the parts of the course and actively take part in practical learning. They should also use the literature advised.

The exam:

The ECTS system of cumulating the points will be applied:

According to which the number of ECTS for the Neurosurgery is 1.

The student's activity during all the modalities of the training will be followed, and the final written exam can bring up to 50 points (the first 50 points can be achieved during the training)
The student has to gain minimally half of the maximal points – 25 to be able to take part in the written exam, and another 25 points on the written exam – totalling in min. 50 points.
The final exam is done in the written form of a test – finally the student can successfully finish the course getting the mark – passed (final colloqium).

Remarks important to students:

The information to the students will be distributed via student representatives, through net – info of the Chair for the neurosurgery, and also will be presented individually on request (secretary of the Chair)

List of lectures, seminars and practical training:

	LECTURES	Number of hours	Place
L1	Introduction – what is Central Nervous System – how to treat it surgically Historical development of Neurosurgery (NS)	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
L2	Patophysiology of the elevated Intracranial Pressure (ICP) – External CSL drainage	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
L3	Spinal neurosurgery – degenerative spine.	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
L4	Pediatric neurosurgery	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
L5	Tumours of the brain and spine	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)

L6	Neurotraumatology – head injuries	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
P7	Neurotraumatology – spine injuries	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
P8	Vascular neurosurgery – intracranial aneurysms	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
	Total number of lectures	**8**	

	SEMINARS	Number of hours	Place
S1	Basics in surgical neuroanatomy	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
S2	CSL derivation - VPA	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
S3	Contemporary and future treatment methods in NS	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
S4	Exam preparations	1	Lecture hall of Clinical Hospital Center Rijeka (Sušak)
	Total hours of seminars	**4**	

	PRACTICALS	Number of hours	Place
P1	Getting used to the NS wards, neurosurgical op. theater Intensive care unit in NS	1	Clinic of Neurosurgery, Clinical Hospital Center Rijeka (Sušak) and operating theaters
P2	Brain tumours	1	Clinic of Neurosurgery, Clinical Hospital Center Rijeka (Sušak) and operating theaters
P3	Degenerative spine diseases	1	Clinic of Neurosurgery, Clinical Hospital Center Rijeka (Sušak) and operating theaters
P4	Neurotraumatology, Neurorehabilitation	1	Clinic of Neurosurgery, Clinical Hospital Center Rijeka (Sušak) and operating theaters operating theaters
P5	VPA systems; spine – immobilisation; typical head bandages.	1	Clinic of Neurosurgery, Clinical Hospital Center

			Rijeka (Sušak) and operating theaters
P6	Peripheral nerves – typical diseases and injuries	1	Clinic of Neurosurgery, Clinical Hospital Center Rijeka (Sušak) and operating theaters
P7	Ambulatory patients	1	Clinic of Neurosurgery, Clinical Hospital Center Rijeka (Sušak) and operating theaters
P8	Presence in the operating theater	1	Clinic of Neurosurgery, Clinical Hospital Center Rijeka (Sušak) and operating theaters
	Total number of hours in practice	**8**	

	WRITTEN EXAM
1.	27th October 2021
2.	By appointment

COURSE SCHEDULE (FOR ACADEMIC YEAR 2021./2022.)

Date	Lectures (time and place)	Seminars (time and place)	Practicals (time and place)	Lecturer
4th October 2021 (Monday)	**L1, L2, L3, L4** 09:00 – 09:45 09:45 – 10:30 10:30 – 11:15 11:15 – 12:00 Lecture hall of Clinical Hospital Center Rijeka (Sušak)			Prof. Darko Ledić, MD, PhD
6th October 2021 (Wednesday)	**L5, L6, L7, L8** 09:00 – 09:45 09:45 – 10:30 10:30 – 11:15 11:15 – 12:00 Lecture hall of Clinical Hospital Center Rijeka (Sušak)			Assoc. prof. Hrvoje Šimić, MD, PhD

11th October 2021 (Monday)			P1, P2, P3, P4, P5, P6, P7, P8 09:00 – 09:45 09:45 – 10:30 10:30 – 11:15 11:15 – 12:00 12:00 – 12:45 12:45 – 13:30 13:30 – 14:15 14:15 – 15:00 Groups 1 and 2 (by the list) Clinic of Neurosurgey, Clinical Hospital Center Rijeka (Sušak)	Prof. D. Ledić, MD, PhD Assoc. prof. H. Šimić, MD, PhD A. Gavranić, MD. O. Vidak, MD D. Planinić, MD B. Kolbah, MD Z. Kvas, MD
13th October 2021 (Wednesday)		GROUP 1 S1, S2, S3, S4 09:00 – 12:00 Lecture hall of Clinical Hospital Center Rijeka (Sušak)		Prof. D. Ledić, MD, PhD Assoc. prof. H. Šimić, MD, PhD
13th October 2021 (Wednesday)		GROUP 2 S1, S2, S3, S4 09:00 – 12:00 Lecture hall of Clinical Hospital Center Rijeka (Sušak)		Prof. D. Ledić, MD, PhD Assoc. prof. H. Šimić, MD, PhD
18.10.2021. (monday)			P1, P2, P3, P4, P5, P6, P7, P8 09:00 – 09:45 09:45 – 10:30 10:30 – 11:15	Prof. D. Ledić, MD, PhD Assoc. prof. H. Šimić, MD, PhD

			11:15 – 12:00 12:00 – 12:45 12:45 – 13:30 13:30 – 14:15 h 14:15 – 15:00 Groups 3 and 4 (by the list) Clinic of Neurosurgey, Clinical Hospital Center Rijeka (Sušak)	A. Gavranić, MD. O. Vidak, MD D. Planinić, MD B. Kolbah, MD Z. Kvas, MD
20.10.2021. (wednesday)			P1, P2, P3, P4, P5, P6, P7, P8 09:00 – 09:45 h 09:45 – 10:30 h 10:30 – 11:15 h 11:15 – 12:00 h 12:00 – 12:45 h 12:45 – 13:30 h 13:30 – 14:15 h 14:15 – 15:00 h Groups 5 and 6 (by the list) Clinic of Neurosurgey, Clinical Hospital Center Rijeka (Sušak)	Prof. D. Ledić, MD, PhD Assoc. prof. H. Šimić, MD, PhD A. Gavranić, MD. O. Vidak, MD D. Planinić, MD B. Kolbah, MD Z. Kvas, MD
25th – 29th October 2021 (exact day later)	**WRITTEN EXAM**	**PLACE**: Lecture hall of Clinical Hospital Center Rijeka (Sušak)	TIME: by appointment (later)	Prof.D. Ledić, MD, PhD

LIST OF **STUDENTS** (Clinical practical exercises groups – 6):

GROUP 1

1. Bogdanović, Macha Natacha
2. Dehling Kim Laura
3. Forst Laura Helene
4. Fritzen Alexander

GROUP 2

5. Gramelt Alfred
6. Haupt Louisa
7. Herrlich Benjamin
8. Huebner Daniel Fabian

GROUP 3

9. Jaeger Marc
10. Jungheim Florian Andreas
11. Kalem Sophia Katharina
12. Lohmann Franziska Sabine

GROUP 4

13. Martin Michael
14. Modrić Ivan Samuel
15. Perhlich Kaspar
16. Pump Sophie

GROUP 5

17. Quint Anna-Katharina Juliana-Helena
18. Schall Pirmin
19. Schlaagenhauf Lucas Frederic
20. Sindik Neda

GROUP 6

21. Spannbauer Luisa Maria
22. Westphal Ann Philine
23. Wisniewski Lisa