



Univerza v Mariboru

Medicinska fakulteta

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	Anesteziologija
Course title:	Anaesthesiology

Študijski program in stopnja Study programme and cycle	Študijska smer Study option	Letnik Year of study	Semester Semester
Dentalna medicina/Dental medicine		3	5
2. stopnja/2nd cycle			

Vrsta predmeta / Course type

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Clinical training	Druge oblike študija Other forms of study	Samost. delo Individual work	ECTS
15	15		15		45	3

Nosilec predmeta / Lecturer:

Jeziki / Predavanja / Lectures:
Languages: Vaje / Tutorial:

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:
Prerequisites:

Vsebina:	Content (Syllabus outline):
Priprava bolnika na anestezijo, pomen spremljajočih bolezni. Anestezijski dihalni sistemi in anestezijski aparat. Splošna anestezija: inhalacijski anestetiki, intravenski anestetiki, opijati in mišični relaksansi. Splošna anestezija – postopki. Nadzor bolnika med anestezijo. Zapleti med anestezijo in po anesteziji. Sedacija bolnika v dentalni medicini. Področna anestezija v dentalni medicini (lokalni anestetiki, lokalna anestezija, področna anestezija v ustni votlini). Zapleti med anestezijo in po anesteziji. Temeljni in dodatni postopki oživljanja. Zdravljenje s kisikom. Fiziologija in psihologija bolečine. Akutna bolečina v področju obraza in ustne votline; vrste in načini zdravljenja. Vrste bolečine in metode zdravljenja kronične bolečine v področju ustne votline in obraza: bolečina zaradi raka, nevropatska bolečina, kronična bolečina, ki ni posledica raka.	Preparation of the patient for anaesthesia, the impact of concurrent disease. Anaesthesia breathing circuits and the anaesthesia machine. General anaesthesia: inhalational anaesthetics, intravenous anaesthetics, opioids and muscle relaxants. Monitoring during anaesthesia. Conscious sedation in dentistry. Regional anaesthesia in dentistry (local anaesthetics, local anaesthesia, peripheral nerve blocks in the mouth). Complications during and after anaesthesia. Basic and advanced life support. Oxygen therapy. Physiology and psychology of pain. Acute pain in the orofacial region; types and modes of treatment. Types of pain and treatment methods of chronic pain in the orofacial region: pain due to cancer, neuropathic pain, chronic pain which is not a consequence of cancer.

Temeljni literatura in viri / Readings:

1. Euliano TY, Gravenstein JS. Essential Anesthesia – from science to practice. Cambridge University Press 2016.
2. European Resuscitation Council Guidelines 2021. ERC Guidelines (cprguidelines.eu) Smernice za oživljanje - Evropski reanimacijski svet <http://slors.szum.si/literatura/>
3. Baart JA, Brand HS. Local Anaesthesia in Dentistr. Springer 2017
4. Girdler NM, Hill M, Wilson KE. Conscious Sedation for Dentistry 2nd Edition. Wiley-Blackwell 2017.
5. Peršec J in sod. Anesteziologija u dentalnoj medicini. Medicinska naklada, Zagreb 2019.
6. Miller RD in sod. Miller's Anesthesia. 9th ed. Philadelphia, Pennsylvania: ELSEVIER Churchill Livingstone; 2019 – izbrana poglavja

7. Novak Jankovič V in sod. Šola anesteziologije, reanimatologije in perioperativne intenzivne medicine. **Modul 1**, Splošna anestezija 1. Ljubljana: Medicinski simulacijski center, Univerzitetni klinični center: Katedra za anesteziologijo in reanimatologijo, Medicinska fakulteta, 2022. (<https://www.szaim.org/wp-content/uploads/2021/03/Modul1-zbornik-2022.pdf>).
8. Mekiš D in sod. Šola anesteziologije, reanimatologije in perioperativne intenzivne medicine. **Modul 2**, Splošna anestezija 2. Maribor: UKC, Oddelek za anesteziologijo, intenzivno terapijo in terapijo bolečin, 2022. (<https://www.ukc-mb.si/strokovna-sre%C4%8Danja/zborniki>).
9. Zdravkovič M in sod. Šola anesteziologije, reanimatologije in perioperativne intenzivne medicine, **Modul 3**: Temeljni in dodatni postopki oživljanja otrok in odraslih; Maribor: UKC, Oddelek za anesteziologijo, intenzivno terapijo in terapijo bolečin, 2022. (<https://www.szaim.org/wp-content/uploads/2021/03/Ucbenik-modul3-koncna-november-2022.pdf>).
10. Markovič Božič J in sod. Šola anesteziologije, reanimatologije in perioperativne intenzivne medicine. **Modul 4**, Splošna anestezija 3. Ljubljana: Klinični oddelek za anesteziologijo in intenzivno terapijo operativnih strok, Kirurška klinika, Univerzitetni klinični center ; Maribor : Oddelek za anesteziologijo, intenzivno terapijo in terapijo bolečin, Univerzitetni klinični center, 2019. (<https://www.szaim.org/wp-content/uploads/2021/03/Modul4-zbornik.pdf>).
11. Poredoš P in sod. Šola anesteziologije, reanimatologije in perioperativne intenzivne medicine. **Modul 5**, Področna anestezija. Ljubljana : Klinični oddelek za anesteziologijo in intenzivno terapijo operativnih strok, Kirurška klinika, Univerzitetni klinični center, 2020. (<https://www.szaim.org/wp-content/uploads/2021/03/Modul5-zbornik.pdf>).
12. Šoštarčič M in sod. Šola anesteziologije, reanimatologije in perioperativne intenzivne medicine. **Modul 6**, "Kardiorakalna anestezija". Ljubljana: Medicinski simulacijski center, Univerzitetni klinični center: Katedra za anesteziologijo in reanimatologijo, Medicinska fakulteta, 2021. (<http://www.szaim.org/datoteke/Eucbenik-6modul.pdf>).
13. Potočnik I in sod. Šola anesteziologije, reanimatologije in perioperativne intenzivne medicine. **Modul 7**, "Specialna anestezija 2". Ljubljana: Onkološki inštitut Ljubljana, 2021. (<http://www.szaim.org/datoteke/Eucbenik-7modul.pdf>).
14. Kamenik M in sod. Šola anesteziologije, reanimatologije in perioperativne intenzivne medicine. **Modul 8**, "Specialna anestezija 3". Maribor: Univerzitetni klinični center : Medicinska fakulteta, 2021. (<https://www.ukc-mb.si/strokovna-sre%C4%8Danja/zborniki>)

Cilji in kompetence:

Seznani študenta medicine z področji dela anesteziologa (anestezija, perioperativna intenzivna terapija in terapija bolečine). Študent spozna pomen priprave bolnika na operacijo, delovanje anestetikov, izpeljavo vseh faz anestezije, vrednotenje podatkov neinvazivnega monitoringa.

Študent spozna metode sedacije bolnika ob ohranjeni zavesti in področne anesteziji v dentalni medicini. Ponovi temeljne in osvoji dodatne postopke oživljanja. Pridobiti osnovno znanje in veščine za diagnosticiranje in zdravljenje bolečine v področju obraza in ustne votline. Študent se seznani z racionalnim načinom uporabe neopijatnih in opijatnih analgetikov pri zdravljenju akutne in kronične bolečine, ter z drugimi metodami zdravljenja bolečine.

Predvideni študijski rezultati:

Objectives and competences:

To give the student an information about the field of work of an anaesthesiologist (anaesthesia, intensive care and pain therapy). The students will get the knowledge about the preparation of the patient for surgery, the mechanism of action of anaesthetics, management of anaesthesia, non-invasive monitoring during anaesthesia. The students will get the knowledge about the methods of conscious sedation and regional anaesthesia in dentistry. The students will learn the methods of basic and advanced life support.

Acquiring basic knowledge and skills for diagnosing and treatment of pain. A student is acquainted with rational mode of the use of non-opioid analgesics and opioids in the treatment of acute and chronic pain and with other methods of pain treatment.

Intended learning outcomes:

Znanje in razumevanje:

Predoperativni pregled in priprava bolnika na operacijo.

Oskrba dihalne poti.

Dodatni postopki oživljanja odraslega.

Anestezijski dihalni sistemi in anestezijski aparat.

Inhalacijski anestetiki, intravenski anestetiki, opijatni analgetiki, mišični relaksanti, lokalni anestetiki.

Venski dostop.

Področna anestezija v dentalni medicini (dentalna anestezija, blokada mandibularnega in maksilarnega živca).

Nekrvavi nadzor obtočil med anestezijo.

Nadzor dihalnih plinov, mišične relaksacije in spanja med anestezijo.

Zapleti med anestezijo in po anesteziji.

Zdravljenje s kisikom in ocena plinske analize arterijske krvi.

Študenti bodo spoznali pomen celostne obravnave bolnika z bolečino v področju obraza in ustne votline. Sposobni bodo pri bolniku ugotoviti vrsto in oceniti intenziteto bolečine, razumeti vpliv bolečine na kakovosti življenja. Študenti bodo usposobljeni uporabiti osnovne metode analgezije za doseganje učinkovite kontrole bolečine, oceniti učinkovitost zdravljenja bolečine.

Veščine:

Predihavanje z dihalno masko in uporaba ročnega dihalnega balona.

Uporaba orofaringealnega tubusa, laringealne maske in orotrahealna intubacija.

Vstavitev venske kanile.

Odmerjanje zdravil med oživljanjem.

Defibrilacija s polavtomatskim in klasičnim defibrilatorjem.

Nekrvavo merjenje krvnega tlaka.

Vrednotenje pulznega oksimetra, kapnografije in plinske analize arterijske krvi.

Faze splošne anestezije (uvod, vzdrževanje, zbujanje).

Uporaba kisikove jeklenke.

Priprava in redčenje zdravil.

Priprava in menjava infuzijske raztopin.

Ocenjevanje vrste in intenzitete bolečinev področju obraza in ustne votline. Predpisovanje neopijatnih in opijatnih analgetikov.

Pomen področnih tehnik v zdravljenju akutne in kronične bolečine.

Ocenjevanje uspešnosti zdravljenja bolečine.

Metode poučevanja in učenja:

Predavanja

Seminarji

Klinične vaje (praktične vaje, vaje na simulatorju)

Načini ocenjevanja:**Knowledge and Understanding:**

Preoperative visit and the preparation of the patient for surgery.

Airway management.

Adult advanced life support.

Anaesthesia breathing circuits and the anaesthesia machine.

Inhalational anaesthetics, intravenous anaesthetics, opioids, muscle relaxants, local anaesthetics.

Venous access.

Regional anaesthesia in dentistry (dental anaesthesia mandibular and maxillary nerve block).

Non-invasive cardiovascular monitoring during anaesthesia.

Monitoring of exhaled gasses, muscle relaxation and sleep during anaesthesia.

Complications during and after anaesthesia.

Oxygen therapy and blood gas analysis.

Students will be acquainted with the meaning of comprehensive treatment of a patient with pain.

They will be able to identify the type of pain in a patient and assess the intensity of pain, understand the influence of pain on the quality of life. Students will be qualified to use basic methods of analgesia for the achievement of efficient pain control, and assess efficiency of pain treatment.

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Key Skills:

Artificial ventilation using a face mask and a self-inflating bag.

The use of oropharyngeal tube, laryngeal mask and orotracheal tube.

Intravenous line placement.

Use of drugs during resuscitation.

Defibrillation using an automatic or classical defibrillator.

non-invasive blood pressure measurement.

The use of the pulse oxymeter, capnography and blood-gas analysis.

General anaesthesia (induction, maintenance, awakening).

The use of oxygen bottle.

Preparation of the drugs.

Preparation and the exchange of intravenous fluid bottles.

Assessment of type and intensity of pain in the orofacial region.

Prescribing non-opiate and opiate analgesics.

Meaning of field techniques in the treatment of acute and chronic pain.

Success assessment of pain treatment.

Learning and teaching methods:

Lectures

Seminars

Clinical training (Practical training, simulator training)

Assessment:**Delež**

(v %) /
Weight (in
%)

Način (pisni izpit, ustno izpraševanje, naloge, projekt): ŠTUDIJSKE OBVEZNOSTI ŠTUDENTOV • Obvezna prisotnost na seminarjih • Obvezna prisotnost na vajah • Prisotnost na predavanjih vsaj 50% POGOJI ZA PRISTOP K POSAMEZNEMU PREVERJANJU ZNANJA Opravljene študijske obveznosti: -vaje -seminarji -predavanja - 50% prisotnost Pisni izpit Ustni izpit	 80 % 20 %	Type (examination, oral, coursework, project): ACADEMIC OBLIGATIONS OF STUDENTS Obligatory attendance at coursework Obligatory attendance at laboratory work Attendance at lectures at least 50% REQUIREMENTS FOR ACCESS TO INDIVIDUAL KNOWLEDGE CHECKING Completed academic obligations: - laboratory work - coursework - lectures – 50% attendance Written exam Oral exam
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Reference nosilca / Lecturer's references:

1. WAGNER-KOVAČEČ, Jožica, POVALEJ BRŽAN, Petra, **MEKIŠ, Dušan**. Efficacy of continuous in-wound infusion of levobupivacaine and ketorolac for post-caesarean section analgesia : a prospective, randomised, double-blind, placebo-controlled trial. BMC anesthesiology. 2018, [vol.] 18, str. [1]-9. ISSN 1471-2253. <https://bmcanesthesiol.biomedcentral.com/track/pdf/10.1186/s12871-018-0609-2>, DOI: 10.1186/s12871-018-0609-2. [COBISS.SI-ID 6501695]
2. KARNJUŠ, Igor, **MEKIŠ, Dušan**, KRIŽMARIČ, Miljenko. Uncontrolled delivery of liquid volatile anaesthetic when using the anaesthetic conserving device. Journal of clinical monitoring and computing. 2018, vol. 32, iss. 4, str. 629-638, ilustr. ISSN 1573-2614. <https://link.springer.com/article/10.1007/s10877-017-0022-2>, DOI: 10.1007/s10877-017-0022-2. [COBISS.SI-ID 1539365828]
3. PROSEN, Gregor, STRNAD, Matej, DONIGER, Stephanie J., MARKOTA, Andrej, STOŽER, Andraž, BOROVIK LESJAK, Vesna, **MEKIŠ, Dušan**. Cerebral tissue oximetry levels during prehospital management of cardiac arrest : a prospective observational study. Resuscitation. [Online ed.]. Aug. 2018, vol. 129, str. 141-145, ilustr. ISSN 1873-1570. <https://www.sciencedirect.com/science/article/pii/S0300957218302259?via%3Dihub>, DOI: 10.1016/j.resuscitation.2018.05.014. [COBISS.SI-ID 6385727]
4. KAMENIK, Mirt, KOS, Darjan, MOLLER PETRUN, Andreja, GREEN, David W, ZORKO, Nuška, **MEKIŠ, Dušan**. Haemodynamic stability during anaesthesia induction with propofol : impact of phenylephrine : a double blind, randomised clinical trial. Signa vitae. 2018, vol. 20, št. 1, str. 20-26, ilustr. ISSN 1845-206X. <http://www.signavitae.com/wp-content/uploads/2018/05/SIGNA-VITAE-2018-141-20-26.pdf>, DOI: 10.22514/SV141.052018.3. [COBISS.SI-ID 6385471]
5. BLAJIČ, Iva, HODZOVIC, Iljaz, LUČOVNIK, Miha, **MEKIŠ, Dušan**, NOVAK-JANKOVIČ, Vesna, STOPAR PINTARIČ, Tatjana. A randomised comparison of C-MAC(TM) and King Vision videolaryngoscopes with direct laryngoscopy in 180 obstetric patients. International journal of obstetric anaesthesia. Aug. 2019, vol. 39, str. 35-41, ilustr. ISSN 0959-289X. <https://www.sciencedirect.com/science/article/pii/S0959289X1830373X?via%3Dihub>, DOI: 10.1016/j.ijoa.2018.12.008. [COBISS.SI-ID 34119641]
6. PERŠA, Lidija, KAMENIK, Mirt, KRČEVSKI-ŠKVARČ, Nevenka, **MEKIŠ, Dušan**. Rocuronium versus succinylcholine for rapid sequence intubation in patients with bowel obstruction. Signa vitae. 2019, vol. 15, no. 2, str. 52-58. ISSN 1845-206X. <http://www.signavitae.com/?s=per%C5%A1a>, DOI: 10.22514/SV152.102019.8. [COBISS.SI-ID 512934456]
7. **MEKIŠ, Dušan**, SOK, Vesna. Effects of intravenous and inhalation induction of anesthesia on oxygen delivery in elderly patients undergoing colorectal surgery = Vpliv intravenskega ali inhalacijskega uvoda v anestezijo na prenos kisika pri starostnikih, operiranih zaradi kolorektalnega raka. Acta medico-biotechnica : AMB. [Tiskana izd.]. 2021, vol. 14, [no]. 1, str. 11-19, ilustr. ISSN 1855-5640. http://actamedbio.mf.um.si/revija/2020/04_amb26_clanek_196-18.pdf. [COBISS.SI-ID 68099843]
8. KRIŽMARIČ, Miljenko, MAVER, Uroš, ZDRAVKOVIČ, Marko, **MEKIŠ, Dušan**. Effects of the reservoir bag disconnection on inspired gases during general anesthesia : a simulator-based study. BMC anesthesiology. 2021, vol. 21, str. 1-9,

ilustr. ISSN 1471-2253. <https://bmcanesthesiol.biomedcentral.com/track/pdf/10.1186/s12871-021-01256-2.pdf>, DOI: 10.1186/s12871-021-01256-2. [COBISS.SI-ID 50343171]

9. MEKIŠ, Jana, STROJAN, Primož, **MEKIŠ, Dušan**, HOČEVAR-BOLTEŽAR, Irena. Change in voice quality after radiotherapy for early glottic cancer. *Cancers*. 2022, vol. 14, iss. 12, str. 1-12. ISSN 2072-6694. <https://www.mdpi.com/2072-6694/14/12/2993>, DOI: 10.3390/cancers14122993. [COBISS.SI-ID 115488259]

10. ZADRAVEC, Tanja, **MEKIŠ, Dušan**, KMETEC, Sergej, VRBNJAK, Dominika. Uporaba in učinkovitost glasbene terapije v enoti intenzivne terapije : sistematični pregled literature = The use and effectiveness of music therapy in an intensive care unit : a systematic literature review. *Obzornik zdravstvene nege : strokovno glasilo Zveze društev medicinskih sester in zdravstvenih tehnikov Slovenije*. 2020, letn. 54, št. 4, str. 315-325, tabele, ilustr. ISSN 1318-2951. <https://obzornik.zbornica-zveza.si/index.php/ObzorZdravNeg/article/view/3027>, <https://doi.org/10.14528/snr.2020.54.4.3027>, DOI: 10.14528/snr.2020.54.4.3027. [COBISS.SI-ID 42855683]

11. ZDRAVKOVIČ, Marko, BERGER-ESTILITA, Joana, WAGNER-KOVAČEC, Jožica, SORBELLO, Massimiliano, **MEKIŠ, Dušan**. A way forward in pulmonary aspiration incidence reduction: ultrasound, mathematics, and worldwide data collection. *Brazilian journal of anesthesiology*. 2021, [v tisku][9 str.]. ISSN 0104-0014. <https://www.sciencedirect.com/science/article/pii/S0104001421002232>, DOI: 10.1016/j.bjane.2021.05.004. [COBISS.SI-ID 66123011]