



OPIS PREDMETA / SUBJECT SPECIFICATION	
Predmet:	MEHANIZMI IN BIOMEHANIKA POŠKODB
Subject Title:	MECHANISMS AND BIOMECHANICS OF INJURY IN TRAUMA

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
BIOMEDICINSKA TEHNOLOGIJA BIOMEDICAL TECHNOLOGY		2	3 ali 4

Univerzitetna koda predmeta / University subject code:

Predavanja Lectures	Seminar Seminar	Sem. vaje Tutorial	Lab. vaje Lab. work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
15	20		10		105	5

Nosilec predmeta / Lecturer:

Izr. prof. dr. Andrej Čretnik

Jeziki /
Languages:

Predavanja / Lecture:
Vaje / Tutorial:

Slovenščina, angleščina / Slovenian, English
Slovenščina, angleščina / Slovenian, English

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

Kandidat mora imeti pred vpisom ustrezno znanje iz naravoslovnih ved z ustreznega področja na nivoju univerzitetnega študija

Prerequisites:

Prior to entering, the candidate for postgraduate program must have an appropriate knowledge and understanding of bioscience (biology, chemistry, physics, mathematics) on the university level.

Vsebina:

Predmet pokaže kako obravnava mehanizma in biomehanike poškodb lahko pomaga pri trijaži in optimiziranju oskrbe poškodovanca. Predstavljen bo pregled biomehanike in odnosa med različnimi mehanizmi poškodb in kliničnimi vzorci poškodb in kako razumevanje le tega izboljša odkrivanje poškodb in komplikacij. Predmet predstavi aktualne ocenjevalne lestvice za poškodbe in uporabo istih.

Predmet obsega:

1. Mehanizmi poškodb in trijaža
2. Mehanizmi poškodb in vzorci poškodb
 - a) Biomehanika topih poškodb
 - b) Mehanizmi poškodb pri prometnih nesrečah (vozilo, kolesar, motorist, pešec)
 - c) Mehanizmi poškodb pri padcih
 - d) Biomehanika in mehanizmi penetratnih

Contents (Syllabus outline):

The subject reviews how consideration of the mechanism of injury can assist in making triage decisions in order to optimize care and to determine the disposition of the trauma patient. The biomechanics of trauma will be reviewed. Examination will also be made of the relationship between various mechanisms of injury and clinical injury patterns in order to improve detection of injuries and anticipation of complications. The subject will be explain traum scores and application in the work.

The subject content:

1. Mechanism of injury and triage decisions
2. Patterns of injury and mechanism of injury
 - a) Biomechanics of Blunt Trauma
 - b) Mechanisms of injury of traffic accidents (motor vechicle crashes, motorcycle and bycycle crashes, pedestrian)
 - c) Mechanism of injury of falls
 - d) Biomechanics and mechanisms of

poškodb (vbodne in strelne poškodbe) e) Eksplozivne poškodbe f) Termalne poškodbe 3. Ocenjevalne (točkovne) lestvice v travmi	penetrating trauma (stab and gunshot wounds) e) Explosion injury f) Thermal injury 3. Trauma scoring
--	---

Temeljni študijski viri / Textbooks:

1. Soreide E, Grande MC (eds), Prehospital Trauma Care, Markel Dekker, Inc., New York, 2001
2. American College of Surgeons, Committee on Trauma. Mechanisms of Injury and Related suspected Injury Patterns. In: Advanced Trauma Life Support for Doctors, Student Course Manual, 7th Edition. Chicago: American College of Surgeons, 2004.
3. Mattox KL, Feliciano DV, Moore EE (eds). Trauma, 4th Edition, New York, McGraw-Hill, 2000.
4. Nahum AM, Melvin J (eds). The Biomechanics of Trauma. Norwalk, CT, Appleton-Century-Crofts, 1985.
5. Vincent JL (ed). 2004 Yearbook of Intensive Care and Emergency Medicine, Springer Verlag Berlin, 2004.
6. Vincent JL (ed). 2005 Yearbook of Intensive Care and Emergency Medicine, Springer Verlag, Berlin 2005.
7. Najnovejši prispevki iz Shock, Chest, Intensive Medicine Care, Critical Care, Critical Care Medicine, Journal of Trauma, Injury

Cilji:

Uporaba načel biomehanike in mehanizmov poškodb pri delu z poškodovanci pri trijaži kar prispeva k izboljšanju predbolnišnične in bolnišnične oskrbe poškodovanca. Seznanjenost z obstoječimi točkovnimi- ocenjevalnimi lestvicami poškodb in kvalitetna uporaba le teh pri kvalitetni oskrbi poškodovanca. Epidemiološko raziskovanje poškodb in zbiranje podatkov. Nadzor nad poškodbo z zmanjšanjem umrljivosti, zbolewnosti in invalidnosti.

Objectives:

The application of principles of biomechanics and mechanisms of injury in work in trauma. The history of the traumatic event and the physical observations of the trauma scene by healthcare personnel may provide important information in the prehospital and hospital phases of patient care. Overview of existing trauma –scoring systems and state-of-art trauma scoring systems used for quality assessment. Injury epidemiology. Injury control with reduce injury mortality, morbidity and disability.

Predvideni študijski rezultati:

Znanje in razumevanje:
 Uporaba mehanizmov, biomehanike poškodb in ocenjevalnih lestvic za hitro in uspešno triažo več poškodovanih, ocenjevanje stopnje prizadetosti in rizika resnih poškodb, spremljanje stanja poškodovanca in predvidevanje razpleta. Uporaba protokolov in sodelovanje pri zbiranju epidemioloških podatkov poškodovancev.
 Prenosljive/ključne spretnosti in drugi atributi:
 Monitoring, tehnike proste venske poti, endotrahealna intubacija, kapnografija, očitavanje EKG-a, uporaba medikamentov v urgentnih situacijah(volumna resuscitacija, inotropi, vazoaktivna terapija) hitra sekvenčna intubacija, tehnike predihavanja, torakalna drenaža, perikardiocenteza, osnove imobilizacije, uporaba točkovnih lestvic. Reševanje scenarija po načelu PBL (problem basic learning)

Metode poučevanja in učenja:

Predavanja, vaje v Simulacijskem centru, samostojno projektno seminarsko delo izbranih poglavij, PBL, ogled in delo na instrumentih,

Intended learning outcomes:

Knowledge and Understanding:
 Application of mechanisms, biomechanics and trauma-scoring systems for immediately triage and they become an essential tool in trauma care management where they have been applied in examination of injury and the risk of serious injury, outcome evaluation, quality assessment, and resource allocation. Use of protocols and collecting of data for trauma epidemiology.
 Transferable/Key Skills and other attributes:
 Monitoring, intravenous access, endotracheal intubation, capnography, electrocardiography and cardiac monitoring, drugs in emergencies (volume resuscitations, inotropes, vasopressors), rapid sequence intubation, ventilatory management, chest tube insertion, pericardiocentesis, fundamentals of immobilisation, applications of scoring-systems in trauma . PBL scenarios.

Learning and teaching methods:

Lectures, laboratory work in Centre of simulation, project seminar, PBL, observation and work with instruments

Načini ocenjevanja:Delež (v %) / **Assessment:**

Weight (in %)

Način (pisni izpit, ustno izpraševanje, naloge, projekt): projektna seminarska naloga z javno predstavitevijo in ustni izpit.		Type (examination, oral, coursework, project): Project seminar – coursework with public demonstration, oral examination
---	--	---

Materialni pogoji za izvedbo predmeta:**Material conditions for subject realization:****Obveznosti študentov:****Students' commitments:***(pisni, ustni izpit, naloge, projekti)**(written, oral examination, coursework, projects):*

Seminarska projektna naloga, vaje in ustni izpit.

Coursework, work Centre of simulation, oral examination

Reference nosilca / Lecturer's references:

HARIH, Gregor, ČRETNIK, Andrej. Interdisciplinary approach to tool-handle design based on medical imaging. BioMed research international, ISSN 2314-6141, 2013, vol. 2013, 8 str., graf. prikazi.
<http://www.hindawi.com/journals/bmri/aip/159159/>, doi: 10.1155/2013/159159. [COBISS.SI-ID 17093654], [JCR, WoS do 5. 11. 2014: št. citatov (TC): 1, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0, Scopus do 21. 10. 2014: št. citatov (TC): 1, čistih citatov (CI): 0, normirano št. čistih citatov (NC): 0]

HUSSEIN, Mohsen, VAN ECK, Carola F., ČRETNIK, Andrej, DINEVSKI, Dejan, FU, Freddie H. Prospective randomized clinical evaluation of conventional single-bundle, anatomic single-bundle, and anatomic double-bundle anterior cruciate ligament reconstruction : 281 cases with 3- to 5-year follow-up. The American journal of sports medicine, ISSN 0363-5465, 2012, vol. 40, no. 3, str. 512-520. <http://ajs.sagepub.com/content/40/3/512.full.pdf+html>, doi: 10.1177/0363546511426416. [COBISS.SI-ID 4192831], [JCR, SNIP, WoS do 19. 11. 2014: št. citatov (TC): 36, čistih citatov (CI): 36, normirano št. čistih citatov (NC): 23, Scopus do 19. 11. 2014: št. citatov (TC): 42, čistih citatov (CI): 42, normirano št. čistih citatov (NC): 27]

Nagrada: Hughston Award, 2013

HUSSEIN, Mohsen, VAN ECK, Carola F., ČRETNIK, Andrej, DINEVSKI, Dejan, FU, Freddie H. Individualized anterior cruciate ligament surgery : a prospective study comparing anatomic single- and double-bundle reconstruction. The American journal of sports medicine, ISSN 0363-5465, 2012, vol. 40, no. 8, str. 1781-1788.
<http://ajs.sagepub.com/content/40/8/1781.full.pdf+html>, doi: 10.1177/0363546512446928. [COBISS.SI-ID 4384063], [JCR, SNIP, WoS do 25. 6. 2014: št. citatov (TC): 14, čistih citatov (CI): 14, normirano št. čistih citatov (NC): 9, Scopus do 18. 6. 2014: št. citatov (TC): 23, čistih citatov (CI): 23, normirano št. čistih citatov (NC): 15]

ČRETNIK, Andrej, KOŠIR, Roman, KOSANOVIĆ, Miloš. Incidence and outcome of operatively treated achilles tendon rupture in the elderly. Foot & ankle international, ISSN 1071-1007, Jan. 2010, vol. 31, no. 1, str. 14-18. [COBISS.SI-ID 3529535], [JCR, SNIP, WoS do 14. 2. 2013: št. citatov (TC): 3, čistih citatov (CI): 3, normirano št. čistih citatov (NC): 2, Scopus do 20. 3. 2013: št. citatov (TC): 5, čistih citatov (CI): 5, normirano št. čistih citatov (NC): 4]

KOŠIR, Roman, ČRETNIK, Andrej. Extremity compartment syndromes. V: MOORE, Laura J. (ur.), TURNER, Krista L. (ur.), TODD, S. Rob (ur.). Common problems in acute care surgery. New York [etc.]: Springer, cop. 2013, str. 463-473, ilustr. [COBISS.SI-ID 4631871]