



Univerza v Mariboru
University of Maribor

Medicinska fakulteta
Faculty of Medicine



OPIS PREDMETA / SUBJECT SPECIFICATION

Predmet:	Tkivna oksigenacija, metabolizem in mikrocirkulacija
Subject Title:	Tissue oxygenation, metabolism and microcirculation

Študijski program Study programme	Študijska smer Study field	Letnik Year	Semester Semester
Biomedicinska tehnologija Biomedical Tehnology		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	30				105	5

Nosilec predmeta / Lecturer:

Prof. dr. Matej Podbregar

Jeziki / Predavanja / Lecture: Slovenski/slovenian

Languages: Vaje / Tutorial: Slovenski/slovenian

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

Prerequisites:

Kandidat mora doseči 300 ECTS na predhodnem študiju.

Graduate degree 300 ECTS

Vsebina:

Uvod: Fiziologija porabe kisika.
Sistemska ocena zadostnosti pretoka-polnitev in upor proti iztisu srca.
Indirektna kalorimetrija-teoretične osnove in praktična uporabnost.
Spektroskopija blizu rdečega spectra (near infrared spectroscopy) - teorija in praktična uporabnost.
Obremenitveno testiranje-namen-instrumenti-tesnte metode-fiziološke spremenljivke-analiza podatkov in interpretacija.
Kaj vemo o kaheksiji?
Metabolizem v ekstremnih pogojih.
Ultrazvočna in vizualna ocena mikrocirkulacije.
Učinki in pomen dušikovega oksida.
P50-ali je pomembna?
Medcelični signali in kisikovi radikali.
Tkivna oksigenacija in apoptoza pri kritično bolnih.
Hipovolemija- integracija fiziologije organskih sistemov.
Klinična uporaba umetnih prenašalcev kisika- ali je anemija pomembna?
Mikrovaskularne spremembe pri bolnikih v cirkulatorni odpovedi
Klinična uporabnost vensko-arterijske pCO₂ razlike.
Miokardna ishemija in reperfuzijska poškodba.
Hipoksična pljučna konstrikcija in pljučna mikro ter makro cirkulacija.

Contents (Syllabus outline):

Introduction: oxygen physiology.
Can we predict tissue oxygenation by systemic oxygenation?
Indirect calorimetry- theory and practical application.
Exercise testing- prupose- instrumentation- testing methods- response variables- data integration and interpretation- illustrative cases.
What do we know about cachexia?
Metabolism in extreme conditions.
Tissue ultrasound and visual methods to asses microcirculation.
Effects and importance of NO.
Significance of P50.
Intracellular signaling by reactive oxygen species.
Clinical tissue oxygen thresh holds for induction of apoptosis in critical illness.
Hypovolemia: integration of organ system phsyiology.
Clinical use of artificial oxygen carriers- is anemia important?
Microvascular alternations in patients with circulatory failure.
Clinical use of venous- arterial pCO₂ difference.
Myocardial ischemia- reperfusion injury.
Hypoxic pulmonary vasoconstriction and pulmonary macro and mircocirculation.
Effects of thrombolysis.
Drug effects on metabolism.

Učinki trombolize. Učinki zdravil na metabolizem. Miopatija pri kritično bolnih. Učinki kardiopulmonalnega oživljanja. Ocena prekrvavitve prebavil. Učinki inzulina in kortikosteroidov pri kritično bolnih. Kinetika laktata.	Myopahty in critical illness. Effects of cardiopulmonary resuscitation. Estimation of gut perfusion. Effects of insulin and corticosteroids in critical illness. Lactate kinetics.
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Temeljni študijski viri / Textbooks:

Pinsky MR., Dhainaut JFA. Pathophysiologic foundations of critical care. Williams and Wilkins ISBN 0683068881.
 Braunwald E. Heart Disease/ a text book of cardiovascular disease. WB. Saunders Company ISBN 0721656668.
 Vincet JL. Yearbook of intensive care and emergency medicine 1999-2004 Springer.
 Podbregar M, Voga G. Workshop on tissue oxygenation and metabolism in critically ill. ISBN 9616373161

Cilji:

Ocena tkivne oksigenacije, obremenitveno testiranje in metabolizem ter učinki fizioloških in patoloških stanj na metabolizem.

Objectives:

To show problems of estimation of tissue oxygenation, metabolism and microcirculation in different conditions.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje:
 Razumeti probleme, ki nastanejo pri oceni tkivne oksigenacije in metabolizma ter mikrocirkulacije pri različnih fizioloških in patoloških pogojih.

Prenesljive/ključne spretnosti in drugi atributi:
 Praktično in teoretična ocena tkivne oksigenacije in metabolizma ter cirkulacije v različnih pogojih.

Knowledge and Understanding:
 To understand problems of estimation of tissue oxygenation, metabolism and microcirculation in different physiological and pathological conditions.

Transferable/Key Skills and other attributes:
 Practical and theoretical knowledge in assessing tissue oxygenation, metabolism and microcirculation in different conditions.

Metode poučevanja in učenja:

Learning and teaching methods:

Predavanja
 Seminarji
 Vaje
 Individualno delo

Lectures
 Seminars
 Tutorials
 Individual work

Načini ocenjevanja:

Delež (v %) /
 Weight (in %)

Assessment:

Način (pisni izpit, ustno izpraševanje, naloge, projekt)
 Pisni izpit
 Seminarska naloga

Type (examination, oral, coursework, project):
 Written examination
 Coursework

Materialni pogoji za izvedbo predmeta :

Vaje se bodo izvajale na Oddelku za intenzivno interno medicino Splošne bolnišnice Celje

Material conditions for subject realization

Tutorial will take place at clinical hospital department of General Community Hospital Celje, Slovenia

Obveznosti študentov:

(pisni, ustni izpit, naloge, projekti)
 Pisni izpit, seminarska naloga

Students' commitments:

(written, oral examination, coursework, projects):
 Written examination, coursework