**DESCRIPTION OF COURSE UNIT FOR DOCTORAL STUDIES AT VILNIUS UNIVERSITY**

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| **Field (s) of science, field (s) (codes)** | Medical and Health Sciences (M 000): Medicine (M 001) | | | |
| **Faculty, Institute, Department/Clinic** | Medicine Faculty<br>Institute of Clinical Medicine<br>Clinic of Rheumatology, Orthopaedics Traumatology and Reconstructive Surgery | | | |
| **Course unit title** (ECTS credits, hours) | **Clinical Traumatology**<br>10 credits (270 hours) | | | |
| **Study method** | **Lectures** | **Seminars** | **Consultations** | **Self-study** |
| Number of ECTS credits | - | 4 | 2 | 4 |
| **Method of the assessment** (in 10 point system) | The exam is considered oral. 3 questions provided.<br>The clinic has a block of questions that is updated every year.<br>Exam evaluation criteria (minimum readable score - 5):<br>(b) general structure and scope of the answer, clear presentation of the knowledge, reasoning, brevity and specificity (3 points);<br>c) ability to participate in discussion, question management, oratory skills (5 points);<br>d) problematic issues lifting (2 points). | | | |

## PURPOSE OF THE COURSE UNIT

To acquaint with the object of traumatology, variations of the clinical picture of bone fractures, physiology and pathology of healing, methods of stimulation of osteogenesis, conservative and operative methods of treatment of bone fractures, their choice in clinical practice, treatment of bone fractures, techniques early and remote treatment outcomes, potential problems and complications, ways to avoid them.

## THE MAIN TOPICS OF THE COURSE UNIT

General part. Object of science of traumatology, understanding of the concept in Lithuania and in the world. Peculiarities of traumatological patient examination. Limb length measurement and methodologies for describing the amplitude of joint movements.

Traumatic injuries of soft tissues: bruises, ligament sprains and tears, wounds. Their diagnosis and treatment. Stopping the bleeding.

Wound healing. Wound toilet and initial surgical treatment. Complications of wound treatment, their prevention.

Bone dislocations. Diagnosis, first aid and treatment. Dislocations of the humerus, their division. Repositioning methodologies: their advantages and disadvantages, possible complications. Follow-up treatment after repositioning. Dislocation of the femur, methods of its reconstruction and peculiarities of further treatment. Normal dislocation.

Changes in bone tissue. Bone tissue consolidation, factors it encouraging and hindering it. Medicinal and natural promotion of osteogenesis ways. Bone plastic.

Adult fractures and pseudoarthrosis. Their treatments.

Conservative treatment of bone fractures. The importance of conservative treatment in

today's traumatology. Traction and immobilization methods: indications, disadvantages and advantages. There are possible complications of conservative treatment of bone fractures and ways to avoid them**.**

Surgical treatment of bone fractures. Osteosynthesis - Surgical connection of bones. Its global development and history, the first osteosynthesis operations in Lithuania. Extramedullary osteosynthesis plate, its advantages and shortcomings. Types of plates. Dynamic compression plates (DCP), fracture ends compression using hole geometry. Limited contact (LC DCP), point contact (PC DCP) and contactless plates. Osteosynthesis angular, supporting, reconstructive, semicircular and others special plates, indications and operating technique. Osteosynthesis with screws: their species and essential characteristics. Standard propeller screwing technique, slip hole. Intramedullary osteosynthesis, its benefits and shortcomings. Indications and contraindications intramedullary osteosynthesis. Intramedullary vinies transverse fastening, barrel and dynamic fixations. Osteosynthesis ways vieline at eight and vieline loop: their benefits and shortcomings. Osteosynthesis external fixations apparatus. Their classification and biomechanical evaluation. Indications bone fractures external fixation and of them in Lithuania. Dynamics concept. Open bone fractures osteosynthesis problems. Osteoporotically changed bone fixations possibilities and peculiarities. Flat bone osteosynthesis. Clavicle fixations problems. Shoulders fractures osteosynthesis. The jawbone proximal end fixations method choice. The jawbone diaphysis fractures osteosynthesis. Humerus distal end osteosynthesis. Broken crank regrowth stable fixation. Forearm bone diaphysis fractures osteosynthesis. Stiff bone distal end fractures osteosynthesis. Hands skeleton fixations peculiarities. Spine vertebrae fractures operating fixation. Unstable pelvis bone fractures fixation: front and rear ring fixations peculiarities and problems. Percutaneous pelvis bone fractures fixation. Femur neck and pertrochanteric fractures stable osteosynthesis. Femur diaphysis osteosynthesis. Femur distal galo fractures osteosynthesis. Patrons fractures osteosynthesis: wire eight biomechanical evaluation. Tibia proximal galo osteosynthesis. Shins bone diaphysis fractures osteosynthesis. Tibia distal galo fractures fixations problems. Ankles fractures osteosynthesis. Heelbone fractures operating fixations opportunities. Others feet skeleton fractures osteosynthesis.

Histology of bone fracture healing and biochemical changes in the fracture environment.

Biomechanics of healthy, fractured and healing bone. Importance of functional loading.

Stability of bone fragments. The concept of fixed fracture stability. Interfragmental and axial compression and ways to achieve them. Clinical methods for assessing stability. Possibilities of objective stability assessment.

AO philosophy of fracture treatment.

## RECOMMENDED LITERATURE SOURCES


1. Rose DM, Smith TO, Nielsen D, Hing CB. Expandable intramedullary nails in lower limb trauma: a systematic review of clinical and radiological outcomes. Strategies Trauma Limb Reconstr. 2013 Apr; 8 (1): 1-12.
2. Bentley, George ( Ed.) European Surgical Orthopedics and Traumatology : The EFORT Textbook. Springer 2014, approx. 4950 p: https://link.springer.com/referencework/10.1007/978-3-642-34746-7
3. Browner, Bruce D. Skeletal Trauma: Basic Science, Management, and Reconstruction, Fifth Edition. Copyright © 2015, 2009 Elsevier Inc. _ Vol 1-2: https://www.amazon.com/Skeletal-Trauma-Management-Reconstruction-2/dp/1455776289

4. Sam W. Wiesel and Todd J. Operative Techniques in Orthopedic Trauma Surgery, LWW, 2021: https://www.amazon.com/Operative-Techniques-Orthopaedic-Trauma-Surgery/dp/1975172035
5. Errani C, Mavrogenis AF, Cevolani L, Spinelli S, Piccioli A, Maccauro G, Baldini N, Donati D. Treatment for long bone metastases based is a systematic literature review. Eur J Orthop Surg Traumatol. 2016 Sep 20. https://www.researchgate.net/publication/308386298_Treatment_for_long_bone_metastases_based_on_a_systematic_literature_review
6. Rathod AK, Dhake RP, Pawaskar A. Minimally Invasive Treatment of a Complex Tibial lateau Fracture with Diaphyseal Extension in a Patient with Uncontrolled Diabetes Mellitus : A Case Report and Review of Literature. Cureus. 2016 May 4; 8 (5): e599.
7. http://emedicine.medscape.com/trauma
8. Diaphyseal fractures : principles : https://www2.aofoundation.org/wps/portal/!ut/p/a0/04_Sj9CPykssy0xPLMnMz0vMAfGjzOKN_A0M3D2DDbz9_UMMDRyDXQ3dw9wMDAx8jfULsh0VAdAsNSU! /? bone = Femur & segment = Shaft & soloState = lyteframe & contentUrl = srg / popup / further_reading /PFxM2/22_Diaphys_fxs-princpl.jsp
9. https://surgeryreference.aofoundation.org/
10. Stefan Rammelt, Michael Swords, Mandeep S Dhillon, Andrew K Sands. Manual of Fracture Management - Foot and Ankle, Thieme, 2020: https://www.thieme.com/books-main/orthopaedic-surgery/product/5523-manual-of-fracture-management-foot-and-ankle

**CONSULTING TEACHERS**

1. Coordinating lecturer: Valentinas Uvarovas (Prof. Dr.).
2. Igoris Šatkauskas (Assoc. Prof. Dr.).
3. Narūnas Porvaneckas (Prof. Dr.).
4. Jaunius Kurtinaitis (Assoc. Prof. Dr.).

**APPROVED:**

By Council of Doctoral School of Medicine and Health Sciences at Vilnius University: 29th of September 2022

Chairperson of the Board: Prof. Janina Tutkuvienė