

# GENERAL MEDICINE – YEAR 3

## SYLLABI OF THE COURSES OFFERED TO EXCHANGE STUDENTS

### YEAR 3 / SEMESTER 5

#### aVLLP0532c Clinical Introduction II - practice

##### Faculty of Medicine

autumn

##### Extent and Intensity

0/7/0. 5 credit(s). Type of Completion: z (credit).

##### Supervisor

MUDr. Milan Sepši, Ph.D.

Department of Internal Cardiology Medicine - Institutions shared with the Faculty Hospital Brno -  
Adult Age Medicine - Faculty of Medicine

##### Course objectives

Learning outcomes of the course: the aim is to teach students the basics of the physical examination of patients in surgery and internal medicine.

##### Learning outcomes

After completing the subject Propaedeutics the student will be able:

- to take complete patient history
  - to perform general physical examination of the patient,
  - to perform basic internal, neurological and surgical examination of the patient.
- Student will be familiar with basic laboratory and other diagnostic tests.
- to perform and evaluate the ECG
  - to recognize basic pathological ECG findings.
  - to describe the physiological findings on chest and abdominal X-rays.

He will be familiar with basic surgical instruments together with their use, will be familiar with immobilization technique, with basic technique of sewing, punching, cannulation, preparation, catheterization.

Student will master the theoretical knowledge of these topics in accordance with the results of the Optimed 2 project.

##### Syllabus

- The student passes 7 hours of practical exercises weekly divided into 2 teaching units, each 3,5 hours. One learning block is internal medicine (former internal propedeutics) supplemented by 3 blocks for anesthesiology and 1 block for urology. The second block is surgical (former surgical propedeutics) supplemented by 1 block in pediatric surgery and 1 block in plastic surgery. Internal medicine: teaching takes place at the departments internal medicines 5th semester 1) Overall patients history - practically at bed 2) Clinical examination

of the head and neck 3) Clinical examination of the heart 4) Clinical examination of the lungs 5) Clinical examination of the abdomen 6) Clinical examination of limbs 7) Basic neurological examination 8) Anesthesiology 9) urology 10- 15) Repetition and practical exercises, credits

6th semester Topics is always supplemented by specialized examination methods for individual issues 1) Special medical history and physical examination of lung diseases 2) Special medical history and physical examination of heart disease 3) Description of the ecg 4) Special medical history and physical examination of kidney and urinary tract diseases 5) Special medical history and physical examination of gastrointestinal and liver diseases 6) Special medical history and physical examination of endocrine diseases 7) Special medical history and physical examination of haematological diseases 8) Special medical history and physical examination of peripheral arteries and veins 9) Special medical history of rheumatological and immunological diseases 10) Basic clinical and auxiliary examinations of laboratory and imaging methods (X-ray, ultrasound, fibroscopic and some other examinations) 11) anesthesiology 12) anesthesiology 13-15) Repetition and practical exercises, credits

Anesthesiology: - providing a breathing path, entering the vascular system (ie a peripheral vein); basic of anesthesia; CPR - the beginning of ACLS (defibrillation, medication, basic algorithm) Surgical part : 5th semester 1. Instruments, equipment of the operating room - devices. 2. Asepsis, antisepsis, disinfection, surgical workplace 3. History and examination of acute abdomen 4. Surgical procedures - types, indications, preparation, postoperative care. 5. Local and general anesthesia 6. Postoperative complications, shock, ICU 7. Infections - early, urinary, respiratory, abdominal, atb, prevention, tetanus, rabies .... 8. Wounds, healing, treatment, sewing. 9. Personal and medical history and examination of injuries 10. Immobilization techniques - bandages, plasters, orthoses 11. Child Surgery - specifics of pediatrics - FDN 12.-15. Repetition, practical exercises, credits

- Summer - 6. Semester 1. Accidental surgery - mass disasters, traumaplanes, sorting patients, treating wounds 2. Bleeding, build-up, loss of blood (injury), loss compensation, transfusion. 3. Fractures - division, treatment, healing, 4. Injury of joints, tendons and muscles 5. Burns, frostbite, corrosion, 6. Sculpture - skin sculpture, transplantation, - PLASTICS 7. Parenteral and enteral nutrition, infusion, indoor environment. 8. Oncology - basic terms, classification, ... 9. Drowning, hanging, injuries of el. By current 10. Transplantation 11. Rehabilitation 12.-15. Repetition, practical exercises, credits

## Literature

### *required literature*

- CHROBÁK, Ladislav, Thomas GRAL and Jiří KVASNIČKA. *Physical examination in internal medicine*. 1. vyd. Praha: Grada, 2003. 239 s. ISBN 9788024706177.

### *recommended literature*

- Bickley, L. S. BATES' GUIDE TO PHYSICAL EXAMINATION AND HISTORY TAKING

## Bookmarks

<https://is.muni.cz/in/tag/LF:aVLLP0532c!>

## Teaching methods

Practicals always has a theoretical and practical part. The theoretical part is devoted to the above-mentioned topic, practical (for which the main emphasis is placed) – at the patient (taking of

personal and medical history, examination of individual organs), basic examination methods (ultrasound, X-ray, laboratory findings, ECG). Practical training (about 50 % of the total volume of teaching) is complemented by a comprehensive range of simulation teaching methods on simulators with varying degrees of fidelity, trainers and virtual patients. Simulation results in subsequent debriefing (feedback to the student). There is also problem-oriented learning in the foreground, where the student is taught by solving the problem presented, as well as team-oriented teaching when small groups of students discuss and choose a solution of the problem. Emphasis is also placed on the development of soft skills, incl. so-called "21st century skills", particularly communication, decision-making skills, critical thinking, crisis communication and teamwork.

### **Assessment methods**

The credit is given for an active approach, based on proven ability to examine the patient. The theoretical knowledge required by the lecturer or self-study required is also required. The final evaluation has two parts: 1. Practical, 2. Oral. Practical part contains a written personal history and physical examination of a particular patient, cognition of surgical instruments, bandage of wound. The oral examination part is tested by 2 examiners: 1 internist and 1 surgeon together. Traditional methods are complemented by objective clinical evaluation that verifies clinical knowledge and other skills such as communication, physical examination, performance, performance interpretation, etc. This evaluation method provides students with objective and specific feedback.

### **Language of instruction**

English

## **aVLIM051c Immunology - practice**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

0/2/0. 3 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. MUDr. Jiří Litzman, CSc.

Department of Clinical Immunology and Allergology - Institutions shared with St. Anne's Faculty Hospital - Faculty of Medicine

### **Course objectives**

After finishing this course the student will understand the pathogenesis of immunopathological diseases and obtain the basic knowledge that he/she will apply in diagnosis and treatment of the most common disturbances of the immune system. In the laboratory part the students will be introduced to the techniques used in immunological laboratory, both serological (agglutination, precipitation, immunofluorescence, ELISA, RIA) and cellular (flow cytometry, lymphocyte proliferation tests, neutrophil function assessment) to allow him to interpret the most common laboratory immunology methods in medicine. In the clinical part the mechanisms leading to immunopathological diseases such as clinical manifestation of those diseases will be discussed to allow the students to apply their

knowledge in clinical medicine. The student will also discuss immunological problems associated with transplantation and malignancies.

### **Learning outcomes**

The student will get acquainted with the basic methods of serological immunological diagnostics;  
The student will be acquainted with the basic methodologies for examining the number and function of the immune system cells;  
The student will understand the importance, principle and clinical value of the diagnostic tests necessary for the diagnosis of allergic, autoimmune and immunodeficiency diseases;  
The students will become acquainted with immunological laboratory aspects of transplantation and tumor growth.

### **Syllabus**

- Significance of the past history and of basic clinical and laboratory investigations for indication of immunological tests. Blood count. Serum proteins. Laboratory markers of inflammation. Blood collection. Diagnostic antisera.
- Immunoglobulins and their biological functions. Monoclonal antibodies as diagnostic and therapeutic tools. Interaction between antigen and antibody in vitro. Primary and secondary immunological interactions.
- Serological reactions - overview. Specificity and sensitivity. Titration of serum. Direct and indirect agglutination. Precipitation. Double immune diffusion. Turbidimetry, nephelometry. Immunofluorescence tests. Enzyme analysis (ELISA). RIA. Blotting techniques. Circulating and localised immune complexes. Complement system evaluation
- Major histocompatibility complex: structure, function. HLA typing. Molecular genetic in immunology.
- Innate or natural immunity: phagocytosis, NK cells, cytotoxicity, interferon system, complement system, acute phase reaction, inflammation. Complement system evaluation.
- Cells of the immune system CD nomenclature of leukocyte antigens. Phenotyping of lymphocytes. Flow cytometry. Lymphocyte proliferation tests. Cytotoxicity. Evaluation of phagocytic cells.
- Autoimmunity and disease. Immunological tolerance. Autoantibodies and their laboratory detection. Clinically significant organ specific and organ non-specific autoantibodies.
- Immunoelectrophoresis, immunofixation. Immunophenotyping of leukemia. Clinical significance of paraproteinemia

### **Literature**

#### *recommended literature*

- ABBAS, Abul K., Andrew H. LICHTMAN and Shiv PILLAI. *Cellular and molecular immunology*. 7th ed. Philadelphia: Elsevier/Saunders, 2012. x, 545. ISBN 9780808924258.

### **Teaching methods**

The course is given in a form of seminars and demonstration of laboratory methods.

### **Assessment methods**

interview

### **Language of instruction**

English

## **aVLIM051p Immunology - lecture**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

1/0/0. 3 credit(s). Type of Completion: zk (examination).

### **Supervisor**

prof. MUDr. Jiří Litzman, CSc.

Department of Clinical Immunology and Allergology - Institutions shared with St. Anne's Faculty Hospital - Faculty of Medicine

### **Course objectives**

The course covers basic aspects of the structure and function of the immune system in humans. Topics include mechanisms of non-specific immunity with main emphasis on the inflammatory process, such as humoral and cellular branches of the specific immune response. It includes mainly mechanisms of activation of the immune response and its regulation. Special emphasis is given to immune response to microbes and immunoprophylaxis to infectious and non-infectious diseases. After finishing the course the students will understand and be able to explain the mechanisms of the immune response in physiology, such as immune system disturbances leading to immunopathological diseases.

### **Learning outcomes**

- The student will understand basic mechanisms of functioning of the immune system, functional characteristics of specific and non-specific immune response, and the interrelationship of these reactions;
- The student will understand the importance of the immune system in defense against microbes and tumor growth as well as the principles of active and passive artificial immunization;
- The student will become acquainted with the regional specificity of the individual compartments of the immune system;
- The student will be acquainted with the mechanisms of immune tolerance and the mechanisms of its breakdown leading to autoimmune diseases;
- The student will be familiar with the principles of immunological hypersensitivity and the consequences leading to the development of hypersensitivity reactions;
- The student will be acquainted with basic principles of pharmacological influence of immune reactivity;
- The student will be acquainted with the most important primary and secondary immunodeficient states;

### **Syllabus**

- Immunology in medicine. Medical subject allergology and clinical immunology. Physiology and pathology of the immune system.
- Immunological concept of “own”, “foreign”, “dangerous”.
- Anatomy and cellular elements of the immune system.
- Innate or natural immunity: phagocytosis, NK cells, cytotoxicity, interferon system, complement system, acute phase reaction, inflammation.
- B lymphocytes and immunoglobulins. Genetic basis of immunoglobulin heterogeneity. Biological properties of antibodies.
- T-lymphocytes, their development and effector functions. Polarisation of T-lymphocytes (T1, T2, Th17). Cytotoxicity. Cytokines. Major histocompatibility complex: structure, function.
- Activation of T and B cells by antigen. Interactions between antigen-presenting cells and T- and B-lymphocytes.
- Regulation of the immune reaction.
- Compartmentalization of the immune response. Mucosal immunity.
- Immunity against infectious agents. Microbial antigens.
- Active and passive immunisation.
- Age factor and immune system in humans

### **Literature**

#### *recommended literature*

- ABBAS, Abul K., Andrew H. LICHTMAN and Shiv PILLAI. *Basic immunology : functions and disorders of the immune system*. Fifth edition. St. Louis: Elsevier, 2016. x, 335. ISBN 9780323390828.

### **Teaching methods**

The subject is given in a form of lectures

### **Assessment methods**

Oral exam

### **Language of instruction**

English

## **aVLPA0521c Pathology I - practice**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

0/4/0. 5 credit(s). Type of Completion: z (credit).

## **Supervisor**

doc. MUDr. Leoš Křen, Ph.D.

Department of Pathology - Institutions shared with the Faculty Hospital Brno - Adult Age Medicine - Faculty of Medicine

Contact Person: prof. MUDr. Markéta Hermanová, Ph.D.

## **Course objectives**

The main stress in the pathology course is given on macroscopic and microscopic correlation of diseases. After finishing the course the student should be able to: understand the basic pathologic processes (regressive changes, inflammation, oncology, immune disorders); understand and be able to apply the basic classification of oncologic processes; understand the basic classification of etiologically defined processes (esp. infectious diseases); learn the most important methods used in diagnostic process and research (tissue processing, special stainings, histochemistry, immunohistochemistry, electron microscopy, molecular pathology); understand various disorders with respect to individual organs and organ systems; get familiar with the process of autopsy (the process of the autopsy and its evaluation); get familiar with laboratory processing of the tissue samples (description, tissue sampling);

## **Learning outcomes**

Student is able to:

- explain the discussed terms and concepts.
- to recognize and describe the macroscopic morphology of the basic diseases.
- to recognize and describe the microscopic morphology of the basic diseases.
- to know the etiology of the basic diseases.
- to describe the pathophysiology of the basic diseases.
- to describe the main symptoms of the basic diseases.

## **Syllabus**

- *General Pathology*
- Pathology and its role in medicine.
- Methodology: autopsy, clinico-pathological correlation, surgical pathology (biopsy), ways of tissue examination and fixation
- Cytology.
- The disease, its definition and course. External and internal causes of a disease. Prevention.
- Death (clinical and biological). Signs of death.
- Regressive changes, necrosis (classification, causes). Atrophy: numeric and simple. Dystrophy: metabolic disorders of proteins, glycid, fat, water, minerals and pigments.
- Inflammation: definition, local and general signs, microscopic and macroscopic. Inflammation: classification, nomenclature. Immunity disorders, transplantation pathology.
- Progressive changes. Regeneration, reparation, wound healing. Hypertrophy, hyperplasia, metaplasia, dysplasia. Pseudotumors: cysts, pseudocysts, inflammatory pseudotumor. Disorders of embryonal development.

- Tumors: definition, general properties, etiology, precanceroses. Biology of tumors: benign, malignant and uncertain tumors. Systematic classification of tumors: epithelial, mesenchymal, neuroectodermal and germinal tumors, choriocarcinoma, mesothelioma.
- *Organ pathology*
- Disorders of the heart, circulation of the blood and lymph: Congenital and acquired heart diseases, changes in size and shape of the heart. Pathological contents of the pericardium. Inflammation, ischemic heart disease, myocardial infarction. Circulatory failure. Hypertension. Disorders of arteries and veins: atherosclerosis, aneurysm, inflammation, anemia, polycythemia. Local circulatory disorders: thrombosis, embolism. Bleeding. Lymfadenitis. Tumors.
- Respiratory disorders: Pathology of upper respiratory pathways: rhinitis, laryngitis, bronchitis. Tumors and pseudotumors. Changes in pulmonary ventilation and circulation (venostasis, edema, induration, infarction, embolism). Silicosis and other external pigmentations. Superficial, interstitial and chronic inflammations of the lung. Pulmonary tumors. Pathology of the pleura.
- Disorders of the gastrointestinal tract: Pathology of the oral cavity, pharynx, tonsillae and esophagus. Gastritis, peptic ulcers, gastric tumors. Pathology of the gut: disorders of circulation, inflammation. Appendicitis, malabsorption syndrome. Ileus, herniation. Intestinal tumors. Inflammation of the peritoneum, pathological contents of peritoneal cavity.

## Literature

### *required literature*

- POVÝŠIL, Ctibor and Ivo ŠTEINER. *Obecná patologie*. 1. vyd. Praha: Galén, 2011. xiii, 290. ISBN 9788072627738.
- POVÝŠIL, Ctibor and Ivo ŠTEINER. *Speciální patologie*. 2. vyd. Praha: Galén, 2007. ISBN 978-80-7262-494-2.

### *recommended literature*

- MAČÁK, Jiří, Jana MAČÁKOVÁ and Jana DVOŘÁČKOVÁ. *Patologie*. 2., doplněné vydání. Praha: Grada, 2012. 347 stran. ISBN 9788024735306.

### *not specified*

- BUČEK, Jan. *Praktikum z patologie :pítevní cvičení*. 4. přepr. vyd. Brno: Masarykova univerzita, 1993. 88 s. ISBN 80-210-0721-4.
- FEIT, Josef, P. MIŘEJOVSKÝ and I. STEINER. *Kontrolní otázky z patologie (Test question in pathology)*. 1. vyd. Praha: Triton, 1998. ISBN 80-85875-89-6.

## Teaching methods

Pathology course consists of lectures and practical classes. Teaching consists of *theoretical part* (lectures) and *practical part* (laboratory practice). Practical courses consist of *histological practice* (microscopical and macroscopical images of autoptical and bioptical specimens are demonstrated and discussed) and *autoptical practice* (presence and ev. participation in autopsies). *Hypertext teaching materials* for the students are available in our teaching rooms as well in the Internet. These materials contain about 3000 images of various imaging methods (macroscopic, x-ray, CT, MRI

images, histological images, partially available as virtual slides, videos). Lectures and practicals are complementary. General information and new updates on classifications as well as images are presented at the lectures. Practical add further information, histopathologically and autoptical experience. Further information is provided in our web-based teaching materials. Various forms of testing is used to give the students proper feedback. Students are supposed to prepare for each practical lesson. The topic for each practical lesson as well as for each lecture is available.

### **Assessment methods**

*Lectures: 3 hours/week Practical classes: 4 hours/week; microscopic and autoptical lessons.* The course of pathology is closed by oral exam. Attendance is compulsory; knowledge of the students is periodically tested during the practical classes. Testing can be either oral or written (multichoice tests, essay). Exam after two semesters of pathology has two parts: practical and theoretical. Practical part of the exam takes the form of a discussion over the microscope or over macroscopical or microscopical images. In theoretical part of the exam the students discuss after short preparation randomly selected topics. The list of these topics is available to the students in advance.

### **Language of instruction**

English

## **aVLP0521p Pathology I - lecture**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

3/0/0. 0 credit(s). Type of Completion: z (credit).

### **Supervisor**

doc. MUDr. Leoš Křen, Ph.D.

Department of Pathology - Institutions shared with the Faculty Hospital Brno - Adult Age Medicine - Faculty of Medicine

Contact Person: prof. MUDr. Markéta Hermanová, Ph.D.

### **Course objectives**

The main stress in the pathology course is given on macroscopic and microscopic correlation of diseases. After finishing the course the student should be able to: understand the basic pathologic processes (regressive changes, inflammation, oncology, immune disorders); understand and be able to apply the basic classification of oncologic processes; understand the basic classification of etiologically defined processes (esp. infectious diseases); learn the most important methods used in diagnostic process and research (tissue processing, special stainings, histochemistry, immunohistochemistry, electron microscopy, molecular pathology); understand various disorders with respect to individual organs and organ systems; get familiar with the process of autopsy (the process of the autopsy and its evaluation); get familiar with laboratory processing of the tissue samples (description, tissue sampling);

### **Learning outcomes**

Student is able to explain the discussed terms and concepts. Student is able to recognize and describe the macroscopic morphology of the basic diseases. Student is able to recognize and describe the microscopic morphology of the basic diseases. Student knows the etiology of the basic diseases. Student describes the pathophysiology of the basic diseases. Student describes the main symptoms of the basic diseases.

## Syllabus

- *General Pathology*
- Pathology and its role in medicine.
- Methodology: autopsy, clinico-pathological correlation, surgical pathology (biopsy), ways of tissue examination and fixation
- Cytology.
- The disease, its definition and course. External and internal causes of a disease. Prevention.
- Death (clinical and biological). Signs of death.
- Regressive changes, necrosis (classification, causes). Atrophy: numeric and simple. Dystrophy: metabolic disorders of proteins, glycid, fat, water, minerals and pigments.
- Inflammation: definition, local and general signs, microscopic and macroscopic. Inflammation: classification, nomenclature. Immunity disorders, transplantation pathology.
- Progressive changes. Regeneration, reparation, wound healing. Hypertrophy, hyperplasia, metaplasia, dysplasia. Pseudotumors: cysts, pseudocysts, inflammatory pseudotumor. Disorders of embryonal development.
- Tumors: definition, general properties, etiology, precanceroses. Biology of tumors: benign, malignant and uncertain tumors. Systematic classification of tumors: epithelial, mesenchymal, neuroectodermal and germinal tumors, choriocarcinoma, mesothelioma.
- *Organ pathology*
- Disorders of the heart, circulation of the blood and lymph: Congenital and acquired heart diseases, changes in size and shape of the heart. Pathological contents of the pericardium. Inflammation, ischemic heart disease, myocardial infarction. Circulatory failure. Hypertension. Disorders of arteries and veins: atherosclerosis, aneurysm, inflammation, anemia, polycytemia. Local circulatory disorders: thrombosis, embolism. Bleeding. Lymphadenitis. Tumors.
- Respiratory disorders: Pathology of upper respiratory pathways: rhinitis, laryngitis, bronchitis. Tumors and pseudotumors. Changes in pulmonary ventilation and circulation (venostasis, edema, induration, infarction, embolism). Silicosis and other external pigmentations. Superficial, interstitial and chronic inflammations of the lung. Pulmonary tumors. Pathology of the pleura.
- Disorders of the gastrointestinal tract: Pathology of the oral cavity, pharynx, tonsillae and esophagus. Gastritis, peptic ulcers, gastric tumors. Pathology of the gut: disorders of circulation, inflammation. Appendicitis, malabsorption syndrome. Ileus, herniation. Intestinal tumors. Inflammation of the peritoneum, pathological contents of peritoneal cavity.

## Literature

### *required literature*

- *Underwood's pathology : a clinical approach*. Edited by J. C. E. Underwood - Simon S. Cross. 6th ed. Edinburgh: Churchill Livingstone, 2013. xviii, 769. ISBN 9780702046735.

### *recommended literature*

- KUMAR, Vinay, Abul K. ABBAS and Jon C. ASTER. *Robbins & Cotran pathologic basis of disease*. 9th ed. Philadelphia: Saunders, 2015. xvi, 1391. ISBN 9780808924500.

## Teaching methods

Pathology course consists of lectures and practical classes. Teaching consists of *theoretical part* (lectures) and *practical part* (laboratory practice). Practical courses consist of *histological practice* (microscopical and macroscopical images of autoptical and bioptical specimens are demonstrated and discussed) and *autoptical practice* (presence and ev. participation in autopsies). *Hypertext teaching materials* for the students are available in our teaching rooms as well in the Internet. These materials contain about 3000 images of various imaging methods (macroscopic, x-ray, CT, MRI images, histological images, partially available as virtual slides, videos). Lectures and practicals are complementary. General information and new updates on classifications as well as images are presented at the lectures. Practical add further information, histopathologically and autoptical experience. Further information is provided in our web-based teaching materials. Various forms of testing is used to give the students proper feedback. Students are supposed to prepare for each practical lesson. The topic for each practical lesson as well as for each lecture is available.

## Assessment methods

*Lectures*: 3 hours/week *Practical classes*: 4 hours/week; microscopic and autoptic lessons. The course of pathology is closed by oral exam. Attendance is compulsory; knowledge of the students is periodically tested during the practical classes. Testing can be either oral or written (multichoice tests, essay). Exam after two semesters of pathology has two parts: practical and theoretical. Practical part of the exam takes the form of a discussion over the microscop or over macroscopical or microscopical images. In theoretical part of the exam the students discuss after short preparation randomly selected topics. The list of these topics is available to the students in advance.

## Language of instruction

English

## **aVLPF0521c Pathological physiology I - practice**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

0/3/0. 4 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. MUDr. Anna Vašků, CSc.

Department of Pathological Physiology - Theoretical Departments - Faculty of Medicine

### **Course objectives**

The student will be trained for assuming these knowledge and skills:

Principles and ethics of experimental use of laboratory animals, basic surgical skills, general principles of work with lab. animals - explorative laparotomy

Pathophysiology of blood and bone marrow disorders, haematological findings in selected blood disorders

Statistical analysis of experiments (introduction)

Exp. induced acute radiation syndrome in lab. animal – haematological consequences

Essential hypertension, resting and ambulatory blood pressure (and heart rate) measurements, postural changes, effect of isometric and aerobic exercise

Pathophysiology of ventilation disorders and pulmonary gas exchange – spirometry and hyperoxic test

Secondary hypertension, exp. induced renal ischemia – quantification of renal rennin expression

Conductive disorders, demonstration of selected types of arrhythmias

ECG monitoring of exp. induced arrhythmias in lab. animal

Exp. induced acute renal insufficiency in lab. animal – measurement of GFR based on kinetics of renal inulin excretion

Exp. induced renal failure - peritoneal dialysis in lab. animal

### **Learning outcomes**

: Student applies the basic knowledge of biostatistics to explain the structure of reference intervals

: Student will describe the influence of ionizing radiation on the body at the level of molecular, cellular, tissue, and they justify the time dynamics of the system

: Student will describe changes in blood cell counts dynamics in the acute radiation disease

: Student makes a distinction between deterministic and stochastic effects of ionizing radiation and their practical implications

: Student will explain the principle of ultrasound and dopplerometric examination of the blood vessels, the underlying pathology of peripheral vasculature (venous valvular insufficiency, ischemia, short circuits, and steal syndromes)

: Student interprets the continuous ECG monitoring in experimental animals for several pathological conditions

: Student distinguishes ECG records most commonly occurring arrhythmias (sinus arrhythmia, SVES, atrial fibrillation, atrial flutter, AVRT, AV blockade, ventricular tachycardia, torsades de pointes, ventricular fibrillation)

: Student demonstrates the basic static and dynamic parameters surveyed during the spirometric examination and their relationship to pulmonary diseased

: Student will describe the development of renal ischemia in experimental animal model

: Student will explain the determination of the glomerular filtration rate, depending on the curve of concentration of inulin excretion by the kidneys, while discussing the use of clearance of other substances (creatinine, PAH)

: Student demonstrates the emergence of renovascular hypertension in the Goldblatt's model, renal artery stenosis, the difference between unilateral and bilateral stenosis, the role of the RAAS and the expansion of the volume due to hypertension diagnosis

### **Syllabus**

- Introduction, health & safety in the lab, principles and ethics of experimental use of laboratory animals, basic surgical skills, general principles of work with lab. animals & explorative laparotomy
- Statistical analysis of experiments (introduction)
- Principles of ECG analysis, demonstration of selected pathological ECG patterns
- Conductive disorders (seminar), ECG monitoring of exp. induced arrhythmias in lab. animal
- Principles and demonstration of peripheral blood flow examination using ultrasonography
- Cell cycle, oncogenes and suppressor genes, cancer development. (seminar)
- Exp. induced acute radiation syndrome in lab. animal – haematological consequences
- Secondary hypertension (seminar), exp. induced renal ischemia (part 1)
- Pathophysiology of ventilation disorders and pulmonary gas exchange – spirometry
- Essential hypertension (seminar), resting and ambulatory blood pressure (and heart rate) measurements, postural changes, effect of isometric and aerobic exercise
- Exp. induced renal ischemia – detection of renal renin expression (part 2)
- Exp. induced acute renal insufficiency in lab. animal – measurement of GFR based on kinetics of renal inulin excretion
- Exp. induced renal failure - peritoneal dialysis in lab. animal
- Acid-base balance (seminar), tests, credits

## Literature

### *required literature*

- KAŇKOVÁ, Kateřina, Julie BIENERTOVÁ VAŠKŮ, Lydie IZAKOVIČOVÁ HOLLÁ, Michal JURAJDA, Michal MASAŘÍK, Lukáš PÁCAL and Anna VAŠKŮ. *Pathophysiology practicals for General Medicine and Dental Medicine courses*. 1. vyd. Brno: Masarykova univerzita, 2008. 46 pp. Portal of MU's Faculty of Medicine [online]. ISSN 1801-6103.

### *recommended literature*

- BIENERTOVÁ VAŠKŮ, Julie, Dana BUČKOVÁ, Lydie IZAKOVIČOVÁ HOLLÁ, Michal JURAJDA, Kateřina KAŇKOVÁ, Šárka KUČTÍČKOVÁ, Lukáš PÁCAL, Anna VAŠKŮ and Vladimír ZNOJIL. *Praktikum z patologické fyziologie. Elportál*, Brno: Masarykova univerzita, 2007. ISSN 1802-128X.
- VAŠKŮ, Anna a kol. *Praktikum z patologické fyziologie*. 1. vyd. Brno: Masarykova univerzita, 2000. 59 pp. ISBN 80-210-2318-X.

## Teaching methods

practical exercises in labs, discussion to the given topics, video with comments

## Assessment methods

Practicals are compulsory. The only permitted reason for not attending is a student's sick leave. Student can - with tutor's approval - substitute the particular practical in a given week with another group in case he/she has a justifiable reason for it. Student's participation in the practicals throughout the term is certified by a credit. Students can be given written tests or individual home work by tutor's throughout the term. Students have to be wearing lab coats during the practicals.

### **Language of instruction**

English

## **aVLPF0521p Pathological Physiology I - lecture**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

2/0/0. 0 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. MUDr. Anna Vašků, CSc.

Department of Pathological Physiology - Theoretical Departments - Faculty of Medicine

### **Course objectives**

The aim of the subject is to teach students to be able to answer a sufficient number of pathophysiologically asked questions "why", especially focused on these themes:  
Pathological Physiology as a science. Disease, health, normality. Descriptivism contra normativism.  
Physiology of genes, regulation of gene activity.  
Monogenic and multigenic diseases.  
Shock syndrome.  
Reactive oxygen species (ROS). Ionising radiation effects on cellular level.  
Ionising radiation effects on tissue and organismal level.  
Cardiovascular pathophysiology - systolic and diastolic function.  
Cardiac failure.  
Myocardial ischemia.  
Hypertension.  
Pathophysiology of the gas exchange in the lungs.  
Pathophysiology of respiratory mechanics.  
Chronic obstructive bronchopulmonary disease.  
Restriction pulmonary diseases, respiratory failure.  
Physiology of membrane transports.

### **Learning outcomes**

Student characterizes state of healthy and disease  
Student calls main sources of interindividual variability  
Student discusses influences which determined population frequencies of alleles  
Student distinguishes mutation types according to the mechanism  
Student describes base principles of methods detecting human genome and its variability

Student summarises base types of DNA reparation  
 Student describes base characteristics of monogenic diseases  
 Student discusses base principles and indications of gene therapy  
 Student knows an importance of the term of pharmacogenetics  
 Student demonstrates understanding of an influence of external factors on disease development  
 Student characterizes base features of complex diseases  
 Student summarises importance of epigenetics  
 Student describes pathophysiology of stress reaction  
 Student defines homeostasis term  
 Student is able to describe base principles of multicellular organism functioning  
 Student identifies disorder of growth and development from ontogenetic point of view  
 Student describes results of hypoxia including HIF 1 program  
 Student explains a difference between local and systemic inflammation  
 Student explains pathogenesis of oedema  
 Student discusses etiopathogenesis of the most important ion homeostasis disturbances  
 Student distinguishes base acid base balance disturbances and possibilities of their compensation  
 Student applies knowledge of volume and tonicity regulation  
 Student discusses a role of platelets and physiological endothelium during antiaggregation state and understands base principles of antiaggregation therapy  
 Student knows principles and performance of base coagulation tests  
 Student explains wound healing process with examples of pathological healing  
 Student knows pathophysiology of urgent states in oncology diseases  
 Student explains an importance of micronutrients abnormalities  
 Student knows results of abnormal vitamin levels  
 Student explains mechanism of genomic and non- genomic effects of soluble in lipids vitamins  
 Student discusses pathophysiology of protein metabolism  
 Student understands the base principles of regulation of glucose  
 Student interprets knowledge of immune recognition of own and foreign structure on examples of specifically organ and systemic disorders  
 Student interprets immunological knowledge of hypersensitive mechanisms in pathophysiology of atopic and allergic changes  
 Student describes onset, signs and results of heart and vessels remodelling  
 Student applies chronobiology knowledge for explication of different pathophysiological changes

### **Syllabus**

- Pathophysiology: an integrating medical speciality. Aetiology and pathogenesis of diseases.
- Interaction of cells and intercellular communication, basic principles of intracellular signalling. Reaction of the cell on damage and hypoxia. Cell death. Cytokines network. Chemokines.
- Inflammation. Acute phase reaction. Systemic reaction of organism on damage. Regeneration and reparation. Wound healing.
- Hypertension. Remodelling of blood vessels. Diseases of peripheral blood vessels.
- Metabolism of myocardium, atherosclerosis, ischemic heart disease, myocardium infarction.
- Pathophysiology of malignant transformation.

- Stress
- Stress, general adaptation syndrome.
- Pathophysiology of gas exchange and ventilation control in the lungs.
- Lung diseases.
- Pathophysiological aspects of renal functions. Kidney diseases
- Acute and chronic renal failure.
- Pathophysiology of water and electrolytes. Tonicity and volume disturbances.
- Pathophysiological aspects of metabolism of calcium and phosphates, bone pathophysiology.

## Literature

### *required literature*

- NEČAS, Emanuel a spol. *Obecná patologická fyziologie*. 1. vyd. Praha: Karolinum, 2000. 377 pp. ISBN 80-246-0051-X.
- NEČAS, Emanuel. *Patologická fyziologie orgánových systémů*. 1. vyd. Praha: Karolinum, 2003. 379 s. ISBN 9788024606750.
- NEČAS, Emanuel. *Patologická fyziologie orgánových systémů*. 1. vyd. Praha: Karolinum, 2003. s. 381-760. ISBN 9788024606743.
- Ivan Damjanov: *Pathophysiology*, ISBN 13: 978-1-4160-0229-1, Saunders Elsevier, 2009.

## Teaching methods

lecture

## Assessment methods

The attendance of lectures and only one absence on practicals per semester are necessary for successful accomplishment of the subject. Continuous control of knowledge in practicals is fully in powers of teachers (assays, tests...). Elaborated proceedings of practicals will be put to teachers for credit.

## Language of instruction

English

## **aVLTZ0552 Theoretical Bases of Clinical Medicine II - seminar**

### **Faculty of Medicine**

autumn

### **Extent and Intensity**

0/1.5/0. 3 credit(s). Type of Completion: z (credit).

### **Supervisor**

doc. MUDr. Leoš Křen, Ph.D.

Department of Pathology - Institutions shared with the Faculty Hospital Brno - Adult Age Medicine - Faculty of Medicine

**Language of instruction**

English

**YEAR 3 / SEMESTER 6**

**aVLLP0633c Clinical Introduction III - practice**

**Faculty of Medicine**

spring

**Extent and Intensity**

0/7/0. 5 credit(s). Type of Completion: zk (examination).

**Supervisor**

MUDr. Jan Žák, Ph.D.

First Department of Surgery - Institutions shared with St. Anne's Faculty Hospital - Faculty of Medicine

**Course objectives**

The aim is to teach students the basics of the physical examination of patients in surgery and internal medicine.

**Learning outcomes**

After completing the subject Propaedeutics the student will be able to take complete patient history, to perform general physical examination of the patient, to perform basic internal, neurological and surgical examination of the patient. Student will be familiar with basic laboratory and other diagnostic tests. Student will be able to perform and evaluate the ECG, will be able to recognize basic pathological ECG findings. He will be able to describe the physiological findings on chest and abdominal X-rays. He will be familiar with basic surgical instruments together with their use, will be familiar with immobilization technique, with basic technique of sewing, punching, cannulation, preparation, catheterization.

**Syllabus**

- 1st week Getting to know the workplace, ethical and professional way of contacting patients. Basic administration. 2nd week Basic investigation procedures internally. Practicing anamnesis in internal patients. 3rd week. Proper and optimal examination procedures for head and neck examination, practice. Week 4 Theoretical rehearsals and practical examination of the chest. Examination of the lungs by listening and tapping. 5th week Special medical history of lung disease 6th week theoretical prerequisites for correct examination of the cardiovascular system. Examination of the heart by listening, basic physiological findings 7th week - Special history according to lung diseases 8th week - Special history according to heart diseases 9th week - Special history according to renal diseases 10th week - Special

history according to gastrointestinal and hepatic diseases 11th week - Special history according to endocrine diseases 12th week - Special history according to hematological diseases 13th week - Special history according to peripheral arteries and veins diseases 14th week - Special history according to rheumatic and immunological diseases 15th week - Review of special histories, credit

## Literature

### *required literature*

- ŠPINAR, Jindřich and Ondřej LUDKA. *Propedeutika a vyšetřovací metody vnitřních nemocí. 2.*, přeprac. a dopl. vyd. Praha: Grada, 2013. 336 pp. ISBN 978-80-247-4356-1.
- ZEMAN, Miroslav and Zdeněk KRŠKA. *Chirurgická propedeutika. Třetí, přepracované a do.* Praha: Grada Publishing, 2011. 512 stran. ISBN 9788024737706.

### *recommended literature*

- ŠTOURAČ, Pavel, Josef BEDNAŘÍK, Milan BRÁZDIL, Zdeněk KADAŇKA, Petr KAŇOVSKÝ, Marek MECHL, Jiří PRÁŠEK, Ivan REKTOR, Irena REKTOROVÁ and Radomír ŠLAPAL. *Učebnice obecné neurologie (Textbook of General Neurology). 2.*, přepracované. Brno: Masarykova universita v Brně, 2003. 197 pp. ISBN 80-210-3309-6.

## Bookmarks

<https://is.muni.cz/in/tag/LF:aVLLP0633c!>

## Teaching methods

Practical training (about 50 % of the total volume of teaching) is complemented by a comprehensive range of simulation teaching methods on simulators with varying degrees of fidelity, trainers and virtual patients. Simulation results in subsequent debriefing (feedback to the student). There is also problem-oriented learning in the foreground, where the student is taught by solving the problem presented, as well as team-oriented teaching when small groups of students discuss and choose a solution of the problem. Emphasis is also placed on the development of soft skills, incl. so-called "21st century skills", particularly communication, decision-making skills, critical thinking, crisis communication and teamwork.

## Assessment methods

Traditional methods are complemented by objective clinical evaluation that verifies clinical knowledge and other skills such as communication, physical examination, performance, performance interpretation, etc. This evaluation method provides students with objective and specific feedback.

## Language of instruction

English

## aVLP0622c Pathology II - practice

### Faculty of Medicine

spring

### Extent and Intensity

0/4/0. 4 credit(s). Type of Completion: z (credit).

### **Supervisor**

doc. MUDr. Leoš Křen, Ph.D.

Department of Pathology - Institutions shared with the Faculty Hospital Brno - Adult Age Medicine - Faculty of Medicine

Contact Person: prof. MUDr. Markéta Hermanová, Ph.D.

### **Course objectives**

The main stress in the pathology course is given on macroscopic and microscopic correlation of diseases. After finishing the course the student should be able to: understand the basic pathologic processes (regressive changes, inflammation, oncology, immune disorders); understand and be able to apply the basic classification of oncologic processes; understand the basic classification of etiologically defined processes (esp. infectious diseases); learn the most important methods used in diagnostic process and research (tissue processing, special stainings, histochemistry, immunohistochemistry, electron microscopy, molecular pathology); understand various disorders with respect to individual organs and organ systems; get familiar with the process of autopsy (the process of the autopsy and its evaluation); get familiar with laboratory processing of the tissue samples (description, tissue sampling);

### **Learning outcomes**

Student is able to explain the discussed terms and concepts. Student is able to recognize and describe the macroscopic morphology of the basic diseases. Student is able to recognize and describe the microscopic morphology of the basic diseases. Student knows the etiology of the basic diseases. Student describes the pathophysiology of the basic diseases. Student describes the main symptoms of the basic diseases.

### **Syllabus**

- Inflammation of the liver (hepatitis), cirrhosis, tumors. Pathology of the gall bladder and biliary duct (stones, inflammations, tumors). Icterus. Pancreas: pancreatitis, diabetes, tumors.
- Pathology of the urinary system: Kidney stones, inflammation (glomerulonephritis, pyelonephritis), nephrosis. Uremia. Tumors of the kidney, ureter and urinary bladder. Pathology of the male genital system (inflammation, tumors). Pathology of the female genital system (developmental disorders, inflammation, tumors). Pathology of pregnancy. Pathology of the breast.
- Pathology of the central and peripheral nervous system: trauma, bleeding, vascular disorders. Leptomeningitis, hydrocephalus, brain edema. Tumors of the central and peripheral nervous system. Pathology of the eye: trauma, inflammation, tumors.
- Pathology of the endocrine system: thyroid, parathyroid, suprarenal glands, hypophysis, endocrine pancreas.
- Pathology of the skin: inflammation, tumors and pseudotumors.
- Prenatal and neonatal pathology, pathology of child's age.
- Pathology of the bone, striated muscle and soft tissues.

## Literature

- POVÝŠIL, Ctibor and Ivo ŠTEINER. *Speciální patologie*. 2. vyd. Praha: Galén, 2007. ISBN 978-80-7262-494-2.
- MAČÁK, Jiří. *Obecná patologie*. 1. vyd. Olomouc: Univerzita Palackého v Olomouci, 2002. 189 s. ISBN 8024404362.
- MAČÁK, Jirka and Jana MAČÁKOVÁ. *Patologie (Pathology)*. první. Praha: GRADA, 2004. 347 pp. ISBN 80-247-0785-3.
- BUČEK, Jan. *Praktikum z patologie :pítevní cvičení*. 4. přepr. vyd. Brno: Masarykova univerzita, 1993. 88 s. ISBN 80-210-0721-4.
- FEIT, Josef, P. MIŘEJOVSKÝ and I. STEINER. *Kontrolní otázky z patologie (Test question in pathology)*. 1. vyd. Praha: Triton, 1998. ISBN 80-85875-89-6.

## Teaching methods

Pathology course consists of lectures and practical classes. Teaching consists of *theoretical part* (lectures) and *practical part* (laboratory practice). Practical courses consist of *histological practice* (microscopical and macroscopical images of autoptical and bioptical specimens are demonstrated and discussed) and *autoptical practice* (presence and ev. participation in autopsies). *Hypertext teaching materials* for the students are available in our teaching rooms as well in the Internet. These materials contain about 3000 images of various imaging methods (macroscopic, x-ray, CT, MRI images, histological images, partially available as virtual slides, videos). Lectures and practicals are complementary. General information and new updates on classifications as well as images are presented at the lectures. Practical add further information, histopathologically and autoptical experience. Further information is provided in our web-based teaching materials. Various forms of testing is used to give the students proper feedback. Students are supposed to prepare for each practical lesson. The topic for each practical lesson as well as for each lecture is available.

## Assessment methods

*Lectures*: 3 hours/week *Practical classes*: 4 hours/week; microscopic and autoptic lessons. The course of pathology is closed by oral exam. Attendance is compulsory; knowledge of the students is periodically tested during the practical classes. Testing can be either oral or written (multichoice tests, essay). Exam after two semesters of pathology has two parts: practical and theoretical. Practical part of the exam takes the form of a discussion over the microscope or over macroscopical or microscopical images. In theoretical part of the exam the students discuss after short preparation randomly selected topics. The list of these topics is available to the students in advance.

## Language of instruction

English

## aVLPA0622p Pathology II - lecture

Faculty of Medicine

spring

Extent and Intensity

3/0/0. 6 credit(s). Type of Completion: zk (examination).

### **Supervisor**

doc. MUDr. Leoš Křen, Ph.D.

Department of Pathology - Institutions shared with the Faculty Hospital Brno - Adult Age Medicine - Faculty of Medicine

Contact Person: doc. MUDr. Leoš Křen, Ph.D.

### **Course objectives**

The main stress in the pathology course is given on macroscopic and microscopic correlation of diseases. After finishing the course the student should be able to: understand the basic pathologic processes (regressive changes, inflammation, oncology, immune disorders); understand and be able to apply the basic classification of oncologic processes; understand the basic classification of etiologically defined processes (esp. infectious diseases); learn the most important methods used in diagnostic process and research (tissue processing, special stainings, histochemistry, immunohistochemistry, electron microscopy, molecular pathology); understand various disorders with respect to individual organs and organ systems; get familiar with the process of autopsy (the process of the autopsy and its evaluation); get familiar with laboratory processing of the tissue samples (description, tissue sampling);

### **Learning outcomes**

Student is able to explain the discussed terms and concepts. Student is able to recognize and describe the macroscopic morphology of the basic diseases. Student is able to recognize and describe the microscopic morphology of the basic diseases. Student knows the etiology of the basic diseases. Student describes the pathophysiology of the basic diseases. Student describes the main symptoms of the basic diseases.

### **Syllabus**

- The Liver and Biliary Tract; The Pancreas.
- The Gastrointestinal Tract.
- The Kidney.
- Urinary collecting system. The Male Genital System.
- The Female Genital System.
- Diseases Of The Pregnancy. Pathology of the Fetus and Newborn.
- The Breast.
- The Central Nervous System (congenital abnormalities, vascular diseases, trauma).
- The Skin.
- The Central Nervous System: Tumors. The Peripheral Nervous System.
- The Bones and Joints, Skeletal muscle.
- Pathology of the endocrine system.

### **Literature**

#### *required literature*

- *Underwood's pathology : a clinical approach*. Edited by J. C. E. Underwood - Simon S. Cross. 6th ed. Edinburgh: Churchill Livingstone, 2013. xviii, 769. ISBN 9780702046735.

#### *recommended literature*

- KUMAR, Vinay, Abul K. ABBAS and Jon C. ASTER. *Robbins & Cotran pathologic basis of disease*. 9th ed. Philadelphia: Saunders, 2015. xvi, 1391. ISBN 9780808924500.

#### **Teaching methods**

Pathology course consists of lectures and practical classes. Teaching consists of *theoretical part* (lectures) and *practical part* (laboratory practice). Practical courses consist of *histological practice* (microscopical and macroscopical images of autoptical and bioptical specimens are demonstrated and discussed) and *autoptical practice* (presence and ev. participation in autopsies). *Hypertext teaching materials* for the students are available in our teaching rooms as well in the Internet. These materials contain about 3000 images of various imaging methods (macroscopic, x-ray, CT, MRI images, histological images, partially available as virtual slides, videos). Lectures and practicals are complementary. General information and new updates on classifications as well as images are presented at the lectures. Practical add further information, histopathologically and autoptical experience. Further information is provided in our web-based teaching materials. Various forms of testing is used to give the students proper feedback. Students are supposed to prepare for each practical lesson. The topic for each practical lesson as well as for each lecture is available.

#### **Assessment methods**

*Lectures: 3 hours/week Practical classes: 4 hours/week*; microscopic and autoptic lessons. The course of pathology is closed by oral exam. Attendance is compulsory; knowledge of the students is periodically tested during the practical classes. Testing can be either oral or written (multichoice tests, essay). Exam after two semesters of pathology has two parts: practical and theoretical. Practical part of the exam takes the form of a discussion over the microscope or over macroscopical or microscopical images. In theoretical part of the exam the students discuss after short preparation randomly selected topics. The list of these topics is available to the students in advance.

#### **Language of instruction**

English

## **aVLPF0622c Pathological Physiology II - practice**

#### **Faculty of Medicine**

spring

#### **Extent and Intensity**

0/3/0. 3 credit(s). Type of Completion: z (credit).

#### **Supervisor**

prof. MUDr. Anna Vašků, CSc.

Department of Pathological Physiology - Theoretical Departments - Faculty of Medicine

Contact Person: prof. MUDr. Anna Vašků, CSc.

## Course objectives

The objective of the practical exercises and seminars from pathological physiology is to provide students basic idea about pathological states and experimental work. Students will also acquire practical skills necessary for their subsequent(future) study and work.

## Learning outcomes

Student will explain the pharmacological options affecting the secretion of gastric juice in the context of experimentally induced gastric ulcer in experimental animal model (inhibition of proton pump, H<sub>2</sub> receptor blockade);

Student will explain the pharmacological options affecting the secretion of gastric juice in the context of experimentally induced gastric ulcer in experimental animal model (inhibition of proton pump, H<sub>2</sub> receptor blockade);

Student demonstrates the principle of load test (oGTT) in an animal model of experimentally induced diabetes (alloxan);

Student shall identify clinically relevant parameters describe nutritional status (calorimetry, BMI, WHR index, the weight, the skin-fold thickness, bioimpedance, DEXA) ;

Student demonstrates the examination of the quality of the skin barrier, through the examination of resistance and conductivity of the skin or a chemical (Burckhardt's) examination with regard to the composition of the skin barrier;

Student demonstrates onset of obstruction icterus induced by ligation of ductus choledochus. He understands etiopathogenesis of other types of icterus (hemolytic, hepatic) and diagnostics of them using heme metabolites in urine, blood and stool using mitochondrial/cytoplasmatic membranes liver enzymes;

Student describes etiopathogenesis of venous thrombosis using data from experimental animal model;

Student will explain the importance and principles of DNA diagnostics to detect I/D polymorphism using PCR methodology ACE

## Syllabus

- Exp. induced peptic ulcer in lab. animal, image analysis.
- Obstructive jaundice preparation
- Exp. induced jaundice in lab. animal
- Pathophysiology of GIT (tutorial)
- Statistical evaluation of experiments (advanced methods), practical analysis of exp. data (using stat. software) Neuropathophysiology (tutorial)
- Exp. induced vein thrombosis in lab. animal
- Overview of molecular biology exp. methods used in pathophysiology (tutorial & demonstration of selected lab. methods)
- Genetic susceptibility to disease – monogenic vs. complex diseases (tutorial)
- Haematology, blood transfusion (tutorial) Anaphylactic reaction, pathophysiology of circulatory shock (tutorial)
- Skin barrier disorders (measurement of skin conductivity)

- Exp. induced diabetes mellitus preparation
- Exp. induced diabetes mellitus – diagnosis by glucose tolerance test

## Literature

### *recommended literature*

- KAŇKOVÁ, Kateřina, Julie BIENERTOVÁ VAŠKŮ, Lydie IZAKOVIČOVÁ HOLLÁ, Michal JURAJDA, Michal MASAŘÍK, Lukáš PÁCAL and Anna VAŠKŮ. *Pathophysiology practicals for General Medicine and Dental Medicine courses*. 1. vyd. Brno: Masarykova univerzita, 2008. 46 pp. Portal of MU's Faculty of Medicine [online]. ISSN 1801-6103.
- BIENERTOVÁ VAŠKŮ, Julie, Dana BUČKOVÁ, Lydie IZAKOVIČOVÁ HOLLÁ, Michal JURAJDA, Kateřina KAŇKOVÁ, Šárka KUČTÍČKOVÁ, Lukáš PÁCAL, Anna VAŠKŮ and Vladimír ZNOJIL. *Praktikum z patologické fyziologie. Elportál*, Brno: Masarykova univerzita, 2007. ISSN 1802-128X.

## Teaching methods

practical exercises in lab, seminars

## Assessment methods

Practicals are compulsory (the only permitted reason for not attending is a student's sick leave). Students can be given written tests or individual home work by tutor's throughout the term. Student's participation in the practicals throughout the term is certified by a credit given upon the following conditions: (i) complete attendance, (ii) complete protocols from the exp. practicals, (iii) individual criteria announced by the principal tutor.

## Language of instruction

English

## **aVLOZ0642c Public Health II - practice**

### **Faculty of Medicine**

spring

### **Extent and Intensity**

0/2/0. 1 credit(s). Type of Completion: z (credit).

### **Supervisor**

prof. MUDr. Bc. Zuzana Derflerová Brázdová, DrSc.  
Department of Public Health - Theoretical Departments - Faculty of Medicine  
Contact Person: Mgr. Martin Forejt, Ph.D.

### **Course objectives**

THE AIM OF THE SUBJECT IS:

- understanding the complexity of relationships between the environment, the individual and the

population,

- awareness of the influence of environmental factors (physical, biological, chemical, psychosocial), civilization changes and lifestyle on the health of the individual and the population,
- familiarization with the basic procedures for the prevention of health damage at individual and company level in relation to individual factors,
- adopting procedures to enhance the positive development of health,
- awareness of the importance of the physician's position in the protection and support of health,
- understanding the basic principles of the emergence and spread of infectious diseases and their prevention in healthcare settings.

### **Learning outcomes**

AT THE END OF COURSE, THE STUDENT WILL BE ABLE:

- to explain the relationship between human and environment, its physical, chemical, biological and psychosocial factors and their interactions.
- to explain the role of adaptation and its active support for the positive development and promotion of both individual and public health;
  
- to make deduction about possibilities for preventive provisions in the field of clean and safe environmental, occupational and home surrounding, the quality of air, water, food.
- to understand and explain the different types of prevention, their tasks and aims and methods of realization.
  
- to interpret the positive and negative influences of lifestyle factors on human/public health, including the autoaggressive behaviours (nutrition, physical activity, psychical overload and stress, smoking, abuse of alcohol and illegal drugs);
- to make deductions about the importance of environment and lifestyle in the health protection and promotion, and about the primary prevention priorities;
  
- to formulate decisions about concrete preventable possibilities for some more important non-communicable diseases, such as cardiovascular, oncological, metabolically, immune, respiratory.
  
- to design and implement basic preventative and repressive measures to prevent transmission of infections.

### **Syllabus**

- - I. Physical factors of environment
  - II. Biological factors of environment
  - III. Childhood hygiene
  - IV. Adolescent hygiene
  - V. Smoking
  - VI., VII. Nutrition
  - VIII. Dietary consumption evaluation
  - IX. Nutritional status assessment

- X. Assessment of physical activity
- XI. Preventive epidemiological measures; principles of vaccination
- XII. Repressive anti-epidemic measures, epidemiological investigation at the outbreak
- XIII. Healthcare facilities - hygiene requirements and operating conditions. Non-specific routes of infection transmission
- XIV. Specific risks of transmission of infections in health care settings
- XV. Disinfection and sterilization, clean rooms in healthcare.

## Literature

### *required literature*

- *Wallace/Maxcy-Rosenau-Last public health & preventive medicine*. Edited by Robert B. Wallace - Neal Kohatsu - John M. Last - Ross C. Brownson - A. Fifteenth edition. New York: McGraw Hill Medical, 2008. xxvii, 136. ISBN 9780071441988.
- *Infectious disease epidemiology*. Edited by Ibrahim Abubakar - Ted Cohen - Helen Stagg - Laura C. Rodrigues. First published. Oxford: Oxford University Press, 2016. 379 stran. ISBN 9780198719830.

### *recommended literature*

- [www.cdc.gov](http://www.cdc.gov) (information not found in the books).
- [www.who.int](http://www.who.int) (information not found in the books).
- <http://ecdc.europa.eu/en/Pages/home.aspx> (information not found in the books).
- GIBSON, Rosalind S. *Principles of nutritional assessment*. 2nd ed. New York: Oxford University Press, 2005. xx, 908. ISBN 0195171691.

## Teaching methods

Practices and class discussion.

Reading and studying ALL REQUIRED LITERATURE (essential information are also presented in form of lectures in the subject Public health II - lectures) and PRESENTATIONS FROM PRACTICES.

Presentations are available in the section of learning materials of the subject.

For those who will have to write research projects and seminar papers during third, fourth and fifth year, it is strongly recommended to enrol the following courses:

VSIL021 - Information literacy - (3 credits) - e-learning.

VSKP041 - A course of working with information sources and tools (4 credits).

## Assessment methods

REQUIREMENTS TO OBTAIN THE CREDIT:

1. The student must fulfill all the assumptions of the subject.
2. Required participation: At least 80% attendance will be required in order to obtain the credit, even in the case of replaced absences. If a student has more than 20% (more than 3 exercises) absences (apologized or not, absence due to late coming, even replaced), he / she will have to repeat the subject in the following semester or school year.
3. Fulfillment of assigned tasks - see also ABSENCE AND LATECOMER POLICY.
4. Successful completion of the credit test. Students will be admitted to the credit test only if they have met the previous conditions.

#### CREDIT TEST INFORMATION:

1. Get at least 70 % (14 out of 20 questions) in the credit test, which is a requisite to sit for examination.
2. Each student must register in the Information System (IS) in one of the offered credit test terms. The credit test has fixed examination terms / dates - (Only during the examination period, except the examination pre-term). No extra-terms will be given.
3. Students registered to a credit test term will fail the term if:
  - a-) arrive late to the test. No late arrival will be allowed after the start of the credit test.
  - b-) they are not present and previously do not cancel the term in the stipulated periods (see IS).
4. In case of failure, EACH STUDENT CAN RETAKE THE CREDIT TEST TWO MORE TIMES, only in given terms (according to Masaryk University study and examination regulations).
5. In case of failure during the third term (second resit), the student must repeat the course in the following school year.
6. All credit test questions are based on ALL REQUIRED LITERATURE, seminars and lectures.

The credit test is a written examination → 20 multiple choice question test, with only one correct answer - (to pass the test, it is required a minimum of 14 correct answers / points).

#### SCORE:

- Passed → 14 and more points.
- Failed → 13,99 or less points.

In order to omit / avoid guessing while answering the MCQ test / examination, the following system will be used:

- Correct answer = 1 point.
- No answer = 0 point.
- Wrong answer = -0,5 point.

Test scoring will be according to the next formula:

Final score = Number of correct answers - (Number of wrong answers / two).

For example:

15 correct answers (15 x 1 point = 15 points) - Passed.

5 wrong answers (5 x -0,5 = -2,5 points).

15 - 2,5 = 12,5. The final score of the test will be 12,5 answers / points.

Final result = Failed.

\*\* For that reason, only answer the question when you are sure of the answer.

#### ABSENCE AND LATECOMER POLICY:

1) Late coming → the student arrives after 10 minutes from the beginning of the lesson. Such case, even if the student stays in education, leads to confirmed absence in that lesson and have to be solved in accordance with point 2).

2) In case of absences following the first one, the student will be required to prepare a seminar paper of 1500-2000 words starting with the second absence. The seminar work will not be required in case of apologized absence or absence due to late coming that will be replaced by student with an agreement of the teacher of missed topic.

3) The topic of the seminar work is entered based on the student's request, by the teacher from the lesson in which the student was absent. The student can contact the teacher directly or through the contact person of the subject. Seminar work has to be placed in the IS at the latest 7 days after the last day of teaching, otherwise the student will be refused → the student will not get a credit.

4) Students will receive an email with instructions on seminar papers.

5) If the seminar work is rejected due to deficiencies and will not be repaired and reassigned to the student, the student will not meet the requirements of the subject and receive credit (see also REQUIREMENTS TO OBTAIN THE CREDIT).

THERE WILL BE NO EXCEPTIONS. In the following cases, students will be not get the credit / allowed to take the credit test:

- \* Not submitting the assigned seminar paper.
- \* If the seminar paper is rejected due to deficiencies and is not corrected and submitted again.
- \* If the seminar paper is rejected three times.
- \* If the seminar paper has plagiarism or any unethical issues.

#### Language of instruction

English

## aVLOZ0642p Public Health II - lecture

Faculty of Medicine

spring

#### Extent and Intensity

0.5/0/0. 2 credit(s). Type of Completion: k (colloquium).

## **Supervisor**

prof. MUDr. Bc. Zuzana Derflerová Brázdová, DrSc.  
Department of Public Health - Theoretical Departments - Faculty of Medicine

## **Course objectives**

The aim of the subject is in particular:

- understanding the complexity of relationships between the environment, the individual and the population,
- awareness of the influence of environmental factors (physical, biological, chemical, psychosocial), civilization changes and lifestyle on the health of the individual and the population,
- awareness of the importance of the physician's position in the protection and support of health,
- understanding the basic principles of the emergence and spread of infectious diseases and their prevention.

## **Learning outcomes**

AT THE END OF COURSE, THE STUDENT WILL BE ABLE:

- to explain the relationship between human and environment, its physical, chemical, biological and psychosocial factors and their interactions.
- to explain the role of adaptation and its active support for the positive development and promotion of both individual and public health;
  
- to make deduction about possibilities for preventive provisions in the field of clean and safe environmental, occupational and home surrounding, the quality of air, water, food.
- to understand and explain the different types of prevention, their tasks and aims and methods of realization.
  
- to interpret the positive and negative influences of lifestyle factors on human/public health, including the autoaggressive behaviours (nutrition, physical activity, psychical overload and stress, smoking, abuse of alcohol and illegal drugs);
- to make deductions about the importance of environment and lifestyle in the health protection and promotion, and about the primary prevention priorities;
  
- to formulate basic preventative and repressive measures to prevent transmission of infections.

## **Syllabus**

- I. Types of prevention, the Health risk assessment
- II. The environment in the Czech Republic
- III. Environmental chemical factors and toxicology
- IV. Epidemiological determinants of the infectious disease
- V. Surveillance, the pandemic preparedness plans

## **Literature**

*required literature*

- Wallace/Maxcy-Rosenau-Last public health & preventive medicine. Edited by Robert B. Wallace - Neal Kohatsu - John M. Last. Fifteenth edition. New York: McGraw Hill Medical, 2008. xxvii, 136. ISBN 9780071441988.
- *Infectious disease epidemiology*. Edited by Ibrahim Abubakar - Ted Cohen - Helen Stagg - Laura C. Rodrigues. First published. Oxford: Oxford University Press, 2016. 379 stran. ISBN 9780198719830.

### **Teaching methods**

Lectures

Reading and studying ALL REQUIRED LITERATURE.

### **Assessment methods**

The subject is completed by colloquium.

The student is assessed - successful if he/she obtains credits successfully passing the subject - VLOZ0642c Public health II - practices.

### **Language of instruction**

English

## **aVLTZ0653 Theoretical Bases of Clinical Medicine III - seminar**

### **Faculty of Medicine**

spring

### **Extent and Intensity**

0/2.5/0. 3 credit(s). Type of Completion: z (credit).

### **Supervisor**

doc. MUDr. Leoš Křen, Ph.D.

Department of Pathology - Institutions shared with the Faculty Hospital Brno - Adult Age Medicine - Faculty of Medicine

### **Course objectives**

This newly introduced subject focuses on overview exercising of substantial problems from the point of view of anatomist, embryologist, physiologist, pathological physiologist, pathologist, microbiologist, immunologist and finally, corresponding clinician. Using this approach we will conceptually approach closer to strategy of USMLE, Step 1.

### **Learning outcomes**

Understanding of diseases substances on the basis of information interconnections acquired from study of anatomy, histology, biochemistry, pathophysiology and pharmacotherapy in respect to diagnostic and therapeutic opportunities.

### **Syllabus**

- 5/6 Diabetes mellitus

- 6/6 Atherosclerosis
- 7/6 Autoimmune diseases and hypersensitivity in clinical medicine
- 8/6 Microbial microflora interaction microorganism x macroorganism

**Teaching methods**

Education will be performed by interactive seminars, practicals and lectures.

**Assessment methods**

Written test at the end of each semester.

**Language of instruction**

English