

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).

Taught in person.

Guaranteed by

MUDr. Jan Konečný, Ph.D.

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

Contact Person: MUDr. Martina Žižlavská

Course objectives

The course aims to teach students the basics of clinical skills with focus on patient examination in surgery and internal medicine.

Learning outcomes

Selected key learning outcomes:

Students can complete systematic physical examinations and assess specific anamnestic data with a focus on diseases of the gastrointestinal tract, cardiovascular system, respiratory system, neurological, and musculoskeletal examination.

Students can use advanced stitching techniques.

Students identify physiological and pathological auditory findings on the lungs and heart and discuss the distinction of pathological findings.

Students demonstrate the initiation of BLS, including the use of a defibrillator with the recognition of (non-)shockable rhythms and their non-pharmacological solution.

Students are familiar with the basics of systematic physical examination of a child.

Syllabus

- Curriculum at SIMU

- A total of 12 exercises, each with 1.5 hours of home e-learning and 2.5 hours of practice at SIMU. Students attend classes from the 1st to the 12th week of the semester according to the schedule in the interactive syllabus. On the 13th and 14th weeks, there are replacements for public holidays and missed exercises.
- Medical history
- Examination of the gastrointestinal system.
- Examination of the cardiovascular system.
- Examination of the musculoskeletal system, neurological examination.
- Examination of the respiratory system.
- Surgical instruments II., wound care, bleeding.
- ECG II.
- Surgical suturing II.
- Auscultation findings, additional examination methods.
- General medical examination.
- Pediatric clinical examination
- Bandaging and fixation techniques II.
- Online lesson - Documentation.
- **Curriculum of clinical practise in hospital**
- Teaching in clinics begins the 3rd week of the semester. Internal and surgical departments rotate every week - the student goes to the internal department in one week, and to the surgical department the other week (it rotates - see your timetable in IS). There are a total of 12 clinical practices, each lasting 3.5 hours. In the 15th teaching week, substitutes and consultations take place.
- During the practice, the given topic will be briefly discussed with the students, or even a short presentation according to the teacher's choice. During each lesson, students will perform a physical examination of the patient and a practical obtaining of anamnesis, with an emphasis on the topic discussed.
- **Topics of practice in the internal department by weeks**
- 3rd or 4th week: Practice - history taking and examination of the gastrointestinal system
- 5. or 6. Practice - examination of the cardiovascular system + history taking
- 7. or 8. Practice - examination of the respiratory system + history taking
- 9. or 10. Practice - ECG, vascular examination
- 11. or 12. Practice - auscultation findings, additional examination methods
- 13. or 14. Practice - general physical examination, neurological examination
- **Topics of practice in the surgical department by weeks**

- 3rd or 4th-week Practice - history taking and examination of the gastrointestinal system
- 5. or 6. Practice - neurological examination + limbs - movement, vascular exam
- 7. or 8. Practice - history taking and examination of injuries, triage, ABC procedure, bleeding and its construction, compensation for blood loss
- 9. or 10. Practice - history taking and examination, wounds, healing + healing disorders
- 11. or 12. Practice - medical history and general examination + specifics and management of the acute abdomen
- 13. or 14. Fractures - types, classification, healing, examination, treatment, practice - anamnesis + examination

Literature

required literature

- https://is.muni.cz/auth/do/med/el/propedeutics/index_en.html
- Bickley, L. S. BATES´ GUIDE TO PHYSICAL EXAMINATION AND HISTORY TAKING
- LONGMORE, J. M. Oxford handbook of clinical medicine. 9th ed. New York: Oxford University Press, 2014. 902 s. ISBN 9780199609628.
- Surgery at a glance. Edited by P. A. Grace - Neil R. Borley. 5th ed. Chichester: Wiley-Blackwell, 2013. 207 p. ISBN 9781118522608.
- CHROBÁK, Ladislav, Thomas GRAL and Jiří KVASNIČKA. Physical examination in internal medicine. 1. vyd. Praha: Grada, 2003. 239 s. ISBN 9788024706177.

not specified

- BLUMENFELD, Hal. Neuroanatomy through clinical cases. 2nd ed. Sunderland: Sinauer Associates, 2010. xxiii, 100. ISBN 9780878936137.

Bookmarks

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

Teaching methods

Teaching consists of two types of lessons:

A) Lessons in SIMU

- students complete a total of 12 lessons in SIMU and 1 online lesson
- all information is provided in the interactive syllabus of the course
- includes the study of e-learning before each lesson and passing the test before participating in each lesson - evidence-based teaching methodologies are used - simulations, peer-to-peer teaching, 4-step methodology of skills teaching, team-based learning

B) Clinical practice in hospital

- students visit the internal or surgical department each week
- these practical lessons begin in the 3rd week of the semester
- students rotate between internal and surgical departments - according to the timetable information in IS.
- during the practice, the week's topic will be briefly discussed with the students, or even summarized by a short presentation; part of each practice will be an examination of the patient and a practical collection of anamnesis, with an emphasis on the topic discussed.

Assessment methods

To get credit, students must fulfill all these conditions:

A) Lessons in SIMU

1. attending to min. 11 z 12 exercises, active participation during lessons
2. study of e-learning and passing the pre-test before each exercise (until 8 am of the day the lesson is taking place)
3. Fill in the feedback forms after each exercise
4. completion of online lesson - Documentation
5. completion of the final credit test

Late arrival at the exercise is not tolerated, as well as not finishing the pre-test on time. It is necessary to strictly follow the organizational instructions in the interactive curriculum of the course, where students will also learn about the possibility of lesson substitutions at the end of the semester.

B) Clinical practice in hospital

1. attending all 6 lessons at the internal clinic
2. attending all 6 exercises at the surgical clinic

Any substitutions of clinical practices are managed by clinical departments.

Language of instruction

English

aVLIM051c Immunology - practice

Faculty of Medicine

autumn

Extent and Intensity

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

Taught in person.

Guaranteed by

prof. MUDr. Jiří Litzman, CSc.

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

Contact Person: prof. MUDr. Jiří Litzman, CSc.

Supplier department: 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 the 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 them to interpret the most common laboratory immunology methods in medicine. In the clinical part, the mechanisms leading to immunopathological diseases such as the 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 tumour 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).

Taught in person.

Guaranteed by

prof. MUDr. Jiří Litzman, CSc.

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

Contact Person: prof. MUDr. Jiří Litzman, CSc.

Supplier department: 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. 3 credit(s). Type of Completion: z (credit).

Taught in person.

Supervisor

oc. MUDr. Leoš Křen, Ph.D.

Department of Pathology - Joint workplaces with the University Hospital Brno - workplaces of the Bohunice and Mater. Hospital - Faculty of Medicine

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

Supplier department: First Department of Pathology - Institutions shared with St. Anne's Faculty Hospital - Faculty of Medicine (43,00 %), Department of Pathology - Joint workplaces with the University Hospital Brno - workplaces of the Bohunice and Mater. Hospital - Faculty of Medicine (57,00 %)

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

the 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, 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

- KUMAR, Vinay, Abul K. ABBAS and Jon C. ASTER. Robbins & Cotran pathologic basis of disease. Illustrated by James A. Perkins. Ninth edition. Philadelphia: Elsevier Saunders, 2015. xvi, 1391. ISBN 9780808924500.
- Underwood's pathology : a clinical approach. Edited by Simon S. Cross. 6th ed. Edinburgh: Churchill Livingstone, 2013. xviii, 769. ISBN 9780702046735.

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 on 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 are 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. Practical training (about 5 % of the total volume of teaching) is complemented by teaching at SIMU on a dissection simulator.

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, essays). Exam after two semesters of pathology has two parts: practical and theoretical. The practical part of the exam takes the form of a discussion over the microscope or over macroscopical or microscopical images. In the 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.

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Language of instruction

English

aVLPA0521p Pathology I - lecture

Faculty of Medicine

autumn

Extent and Intensity

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

Guaranteed by

doc. MUDr. Leoš Křen, Ph.D.

Department of Pathology - Joint workplaces with the University Hospital Brno - workplaces of the Bohunice and Mater. Hospital - Faculty of Medicine

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

Supplier department: First Department of Pathology - Institutions shared with St. Anne's Faculty Hospital - Faculty of Medicine (50,00 %), Department of Pathology - Joint workplaces with the University Hospital Brno - workplaces of the Bohunice and Mater. Hospital - Faculty of Medicine (50,00 %)

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. 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 on 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 are 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. Practical training (about 5 % 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 to 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

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, essays). Exam after two semesters of pathology has two parts: practical and theoretical. The practical part of the exam takes the form of a discussion over the microscope or over macroscopical or microscopical images. In the 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. 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

aVLPF0521c Pathophysiology I - practice

Faculty of Medicine

autumn

Extent and Intensity

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

Taught in person.

Guaranteed by

prof. MUDr. Kateřina Kaňková, Ph.D.

Department of Pathophysiology - Theoretical Departments - Faculty of Medicine

Contact Person: prof. MUDr. Kateřina Kaňková, Ph.D.

Supplier department: Department of Pathophysiology - Theoretical Departments - Faculty of Medicine

Course objectives

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

Atherosclerosis.

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

Angiology, pulse wave, LI. Principles and demonstration of peripheral blood flow examination using ultrasonography.

Principles of ECG analysis, demonstration of selected pathological ECG patterns

Health and disease, theory of normality, system regulation Acute radiation syndrome. Presentation of the experiment.

Hemocoagulation disorders.

Regulation of haematocrit and pathophysiology of anaemia.

Pathophysiology of respiratory disorders - introduction

Obstructive and restrictive disease. Spirometry

Pathophysiology of ventilation disorders and pulmonary gas exchange.

Pathophysiological principles of oxygenotherapy and mechanical ventilation.

Genetic susceptibility to disease – monogenic vs. complex diseases. Pharmacogenetics.

Cell cycle, oncogenes and suppressor genes, cancer development.

Statistical analysis of experiments (introduction).

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 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

- Atherosclerosis.
- Essential hypertension (tutorial), resting and ambulatory blood pressure (and heart rate) measurements, postural changes, effect of isometric and aerobic exercise.
- Angiology, pulse wave, LI. Principles and demonstration of peripheral blood flow examination using ultrasonography.
- Principles of ECG analysis, demonstration of selected pathological ECG patterns
- Health and disease, theory of normality, system regulation Acute radiation syndrome. Presentation of the experiment.
- Hemocoagulation disorders.
- Regulation of haematocrit and pathophysiology of anaemia.
- Pathophysiology of respiratory disorders - introduction
- Obstructive and restrictive disease. Spirometry
- Pathophysiology of ventilation disorders and pulmonary gas exchange.
- Pathophysiological principles of oxygenotherapy and mechanical ventilation.
- Genetic susceptibility to disease – monogenic vs. complex diseases. Pharmacogenetics.
- Cell cycle, oncogenes and suppressor genes, cancer development.
- Statistical analysis of experiments (introduction). Teachers: Mon – As. MUDr. Michal Jurajda PhD.

- Tue – doc. RNDr. Monika Goldbergová-Pávková, PhD.; As. MUDr. Kamil Ďuriš, PhD.
- Wed – As. MUDr. Jaromír Gumulec, PhD., as. RNDr. Michal Masařík, PhD.
- Thu – As. MUDr. Michal Jurajda PhD.; As. MUDr. Jan Máchal, PhD.

Literature

required literature

- KAŇKOVÁ, Kateřina, Julie BIENERTO VÁ VAŠKŮ, Lydie IZAKOVIČOVÁ HOLLÁ, Michal JURA JDA, 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

- BIENERTO VÁ VAŠKŮ, Julie, Dana BUČKOVÁ, Lydie IZAKOVIČOVÁ HOLLÁ, Michal JURA JDA, 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

Seminars, practical exercises in labs, discussion of the given topics, video with comments. Practical training is complemented by a comprehensive range of simulation teaching methods on virtual patients.

Assessment methods

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

Language of instruction

English

aVLPF0521p Pathophysiology I - lecture

Faculty of Medicine

autumn

Extent and Intensity

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

Taught in person.

Supervisor

prof. MUDr. Kateřina Kaňková, Ph.D.

Department of Pathophysiology - Theoretical Departments - Faculty of Medicine

Contact Person: prof. MUDr. Kateřina Kaňková, Ph.D.

Supplier department: Department of Pathophysiology - Theoretical Departments - Faculty of Medicine

Course objectives

The aim of the subject is to train medical students in preclinical thinking with a focus on etiology and pathogenesis of diseases and its dynamics in the context of organ system pathophysiology as well as general pathophysiology incl.:

- Pathophysiology of cardiovascular system.
- Pathophysiology of digestive system, nutrition deficits. "
- Pathophysiology of endocrine system, metabolic diseases.
- Pathophysiology of hemopoietic system, neoplasias.
- Rheumatic diseases. Immunologically conditioned diseases.
- Pathophysiology of respiratory tract.
- Pathophysiology of kidneys, disturbances in metabolism of water and ions.
- Pathophysiology of nervous system.
- Pathophysiology of muscles and sensory organs.ansports.

Learning outcomes

Student discusses the etiopathogenesis of atherosclerosis at the molecular, cellular and tissue level

- Student will describe the etiopathogenesis of systolic and diastolic dysfunction of myocardium and pressure and volume overload of the heart
- Student distinguishes between the causes of arrhythmias
- Student categorizes the clinical forms of ischemic heart disease and clinically important consequences of heart failure syndrome
- Student will explain the general and special pathophysiology of shock conditions and basic types of shock
- Student will sum up the most common causes of disorders of the respiratory apparatus
- Student characterizes the pathophysiology of chronic bronchitis and pulmonary emphysema
- Student will sum up the pathogenesis of respiratory insufficiency

- Student controls the issue of regulation of renal perfusion
- Student can explain the issue glomerulopathy
- Student categorizes causes of acute and chronic renal failure
- Student will explain the difference between acute and chronic effects of hormones
- Student categorizes acute and chronic renal failure
- Student will explain the difference between acute and chronic effects of hormones
- Student discusses the pathophysiology of clinically significant endocrine disruption of the function
- Student will describe the pathophysiology of clinically significant gastrointestinal disorders, from a clinical point of view
- Student will describe the anemic syndrome including the effects of anemic hypoxia
- Student discusses different classification of anemias
- Student discusses the pathophysiological aspects of transfusion of blood and blood derivatives,
- Student will describe the main categories of diseases of white blood cells
- Student distinguishes principled differences between physiological and pathological blood clotting
- Student discusses the most important hypocoagulation and hypercoagulation disorders • Student will sum up the etiopathogenesis of common diseases of the joints,
- Student demonstrates a knowledge of the etiopathogenesis of diseases of the muscle and neuromuscular plate
- Student rattles off examples of failures of a sensory sensation
- Student demonstrates examples of common neurodegenerative diseases of CNS
- Student discusses the pathophysiology of epilepsy,
- Student will use knowledge of the composition of cerebrospinal fluid
- Student argues the importance of stability of intracranial pressure and its components for the creation of intracranial hypertension
- Student will sum up the function of autonomous (vegetative) system
- Student will sum up the function of movement system and consequences of its failure
- Student describes the systems important for the existence of consciousness and waking

Syllabus

Detailed syllabus is provided in IS - Study materials / instructions.

Literature

recommended literature

- Pathophysiology of disease : an introduction to clinical medicine. Edited by Gary D. Hammer - Stephen J. McPhee. Eight edition. New York: McGraw-Hill Education, 2018. xiv, 814. ISBN 9781260288513.

not specified

- KUMAR, Vinay, Abul K. ABBAS and Jon C. ASTER. Robbins & Cotran pathologic basis of disease. Illustrated by James A. Perkins. Ninth edition. Philadelphia: Elsevier Saunders, 2015. xvi, 1391. ISBN 9780808924500.

Teaching methods

lecture

Assessment methods

Pathophysiology course is finalised by an oral exam. Student will select questions from 4 different topics and he/she is given time to prepare answers (up to 120 min). Following topics will be represented by 1 question in oral exam:

- P: practicals
- A: circulatory, respiratory systems and kidney pathophysiology
- B: gastrointestinal, endocrine, hematopoietic, musculoskeletal and nervous system pathophysiology
- C: general pathophysiology
- Study materials include practical tutorials, recommended literature and handouts provided for lectures.

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).

Taught in person.

Guaranteed by

MUDr. Jan Konečný, Ph.D.

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

Contact Person: Lucie Kučerová

Supplier department: 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 a general physical examination of the patient,
- to perform basic internal, neurological and surgical examination of the patient.

Students 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 the chest and abdominal X-rays.

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

Students 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

- LONGMORE, J. M. Oxford handbook of clinical medicine. 9th ed. New York: Oxford University Press, 2014. 902 s. ISBN 9780199609628.
- Surgery at a glance. Edited by P. A. Grace - Neil R. Borley. 5th ed. Chichester: Wiley-Blackwell, 2013. 207 p. ISBN 9781118522608.
- BLUMENFELD, Hal. Neuroanatomy through clinical cases. 2nd ed. Sunderland: Sinauer Associates, 2010. xxiii, 100. ISBN 9780878936137.

recommended literature

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

Bookmarks

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

Teaching methods

Practicals always have 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 to 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

Students' knowledge and skills are continuously assessed. Students must attend to the lessons at clinical departments and at SIMU. The course is completed by an examination, which has a practical part that takes place in SIMU (OSCE exam) and a theoretical part that is divided into internal and surgical. The theoretical parts of the exam are conducted at the individual surgical and internal departments.

Language of instruction

English

aVLPA0622c Pathology II - practice

Faculty of Medicine

spring

Extent and Intensity

0/4/0. 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

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 the 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 on 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, histopathological and autoptical experience. Further information is provided in our web-based teaching materials. Various forms of testing are 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

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, inflammaton, 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, H₂ 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, H₂ 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 KUČHTÍČKOVÁ, 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

aVLPF0622p Pathological Physiology II - lecture**Faculty of Medicine**

spring

Extent and Intensity

2/0/0. 5 credit(s). Type of Completion: zk (examination).

Guaranteed by

prof. MUDr. Anna Vašků, CSc.

Department of Pathophysiology – Theoretical Departments – Faculty of Medicine

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

Course objectives

The aim of the subject is to train general medicine students in dynamic thinking about etiology and pathogenesis of diseases focused on special pathophysiology as well as molecular pathophysiology themes:

Pathophysiology of cardiovascular system.

Pathophysiology of digestive system, nutrition deficits.

Pathophysiology of endocrine system, metabolic diseases.

Pathophysiology of hemopoietic system, neoplasias.

Rheumatic diseases. Immunologically conditioned diseases.

Pathophysiology of respiratory tract.

Pathophysiology of kidneys, disturbances in metabolism of water and ions.

Pathophysiology of nervous system.

Pathophysiology of muscles and sensory organs.

Learning outcomes

Student discusses the etiopathogenesis of atherosclerosis at the molecular, cellular and tissue level

Student will describe the etiopathogenesis of systolic and diastolic dysfunction of myocardium and pressure and volume overload of the heart

Student distinguishes between the causes of arrhythmias

Student categorizes the clinical forms of ischemic heart disease and clinically important consequences of heart failure syndrome

Student will explain the general and special pathophysiology of shock conditions and basic types of shock

Student will sum up the most common causes of disorders of the respiratory apparatus

Student characterizes the pathophysiology of chronic bronchitis and pulmonary emphysema

Student will sum up the pathogenesis of respiratory insufficiency

Student controls the issue of regulation of renal perfusion

Student can explain the issue glomerulopathy
 Student categorizes causes of acute and chronic renal failure
 Student will explain the difference between acute and chronic effects of hormones
 Student categorizes acute and chronic renal failure
 Student will explain the difference between acute and chronic effects of hormones
 Student discusses the pathophysiology of clinically significant endocrine disruption of the function
 Student will describe the pathophysiology of clinically significant gastrointestinal disorders, from a clinical point of view
 Student will describe the anemic syndrome including the effects of anemic hypoxia
 Student discusses different classification of anemias
 Student discusses the pathophysiological aspects of transfusion of blood and blood derivatives,
 Student will describe the main categories of diseases of white blood cells
 Student distinguishes principled differences between physiological and pathological blood clotting
 Student discusses the most important hypocoagulation and hypercoagulation disorders
 Student will sum up the etiopathogenesis of common diseases of the joints,
 Student demonstrates a knowledge of the etiopathogenesis of diseases of the muscle and neuromuscular plate
 Student rattles off examples of failures of a sensory sensation
 Student demonstrates examples of common neurodegenerative diseases of CNS
 Student discusses the pathophysiology of epilepsy,
 Student will use knowledge of the composition of cerebrospinal fluid
 Student argues the importance of stability of intracranial pressure and its components for the creation of intracranial hypertension
 Student will sum up the function of autonomous (vegetative) system
 Student will sum up the function of movement system and consequences of its failure
 Student describes the systems important for the existence of consciousness and waking

Syllabus

- Syllabus
- Pathophysiology of gastrointestinal system
- Pathophysiology of fetoplacental unit
- Pathophysiological aspects of chosen allergic and autoimmune diseases
- Pathophysiological aspects of oncologic emergencies
- General pathophysiology of endocrine system
- Special pathophysiology of endocrine system
- Pathophysiology of nutrition disorders
- Pathophysiology of lipid metabolism defects
- Pathophysiological aspects of sugar metabolism defects. Diabetes mellitus
- Pathophysiology of vitamins
- Pathophysiology of nervous system: motoric system
- Pathophysiology of nervous system: degenerative disorders

- DNA diagnostics in complex diseases. Basic principles of pharmacogenomics and personalized medicine.

Literature

required literature

- DAMJANOV, Ivan. *Pathophysiology*. Illustrated by Matt Chansky. 1st ed. Philadelphia: Saunders/Elsevier, 2009. vii, 464. ISBN 9781416002291.

recommended literature

- *Taschenatlas der Physiologie (Online)*. Edited by Agamemnon Despopoulos - Stefan Silbernagel. 5th ed., completely rev. and. New York: Thieme, 2003. xiii, 436. ISBN 1588900614.

Teaching methods

lecture

Assessment methods

Oral exam. The final exam is oral; student will answer 4 questions selected by lot from general, special pathophysiology, practicals and lectures. Individual evaluation from practicals (described by assistant) is taken into account.

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 (information not found in the books).
- 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

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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 Aterosklerosis
- 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