

48SJ-PATH

ECTS: 5

YEAR: 2022Z

PATHOPHYSIOLOGY PATHOPHYSIOLOGY

COURSE CONTENT CLASSES

1. Pathophysiology of the nervous system. 2. Pathophysiology of the hematopoietic system. 3. Pathophysiology of the cardiovascular system part. 1; 4. Pathophysiology of the cardiovascular system - ECG part. 2; 5. Pathophysiology of the system respiratory system. 6. Pathophysiology of the digestive system - digestive tract and pancreas part. 1; 7. Pathophysiology digestive system - liver part 2; 8. Water-electrolyte and acid-base imbalances. 9. Pathophysiology of the excretory system. 10. Pathophysiology of the endocrine system

LECTURES

LECTURES: 1. Pathophysiology of shock: 1. Types of shock: cardiogenic, hypovolemic / haemorrhagic, distributional. Mixed forms of shock. Sepsis and septic shock. Adrenal crisis. 2. Microcirculation disorders in shock. Mechanisms of adaptation and compensation in shock. 3. Phases of shock: reversible, irreversible decompensated. 4. The immune system in shock, the clotting cascade, inflammation, oxidative stress and stress ischemia-reperfusion, 5. Consequences in organs and selected clinical symptoms in various types and phases of shock; 2. Pathophysiology of diseases of the central nervous system: 1. Pathogenesis of the multiple sclerosis (sclerosis multiplex, MS). 2. Development of basic research and understanding of the mechanisms in SM; 3. Pathophysiology of neoplastic diseases: 1. What is neoplastic disease: changing at the levels: genomic, epigenetic. Dysregulation by growth factor receptors, immun system surveillance disorders. 2. Factors promoting carcinogenesis in humans. 3. Principles of anticancer therapies, clinical trials, the importance of molecularly targeted drugs; 4. Autoimmunity and autoimmune diseases: 1. Mechanisms preventing autoimmunity 2. Mechanisms of autoimmunity 3. Genetic factors predisposing to the development of autoimmunity. 4. Immunopathogenetic mechanisms in autoimmune diseases. 5. Autoimmune diseases - specific and systemic; 5. Basics pathophysiology of the cardiovascular system - atherosclerosis: 1. Pathophysiology of atherosclerosis. 2. Lipid disorders. 6. Pathophysiology of cardiovascular diseases: 1. Heart failure. 2. Cardiomyopathies. 3. Ischemic heart disease; 7. Pathophysiology of respiratory diseases: 1. Anatomy of the respiratory system. 2. Pathophysiology of respiration mechanics. 3. Lung volumes and capacities. 4. Disorders of gas diffusion. 5. Research in functional respiratory system; 8. Pathophysiology of gastrointestinal diseases: 1. Swallowing disorders. 2. Esophageal diverticula. 3. Helicobacter pylori infection. 4. Tumors of the stomach. 5. Gallstones. 6. Acute inflammation of the pancreas. 7. Inflammatory bowel diseases and colon cancer; 9. Disturbances in the volume-pressure balance of the intracranial space: 1. The volume-pressure balance of the space intracranial in health (Monroe-Kelly rule and the five aspects of equilibrium, which is notified by chemical, pressure and neurogenic methods). 2. Pathophysiology of volume and pressure disorders in intracranial spaces with vegetative exponents (Cushing's triad). 3. Basics pathophysiology of the increase in intracranial pressure associated with the occurrence of cerebral edema (types cerebral edema), fluid and electrolyte imbalances and their effect on intracranial pressure. Hydrocephalus (types and procedures resulting from the differences in the pathomechanisms of the different types of hydrocephalus). 4. Types wedging of the brain in natural intracranial openings; 10. Pathophysiology of pain: 1. Anatomical pathway of pain sensation. 2. The essence of pain, physiological pain and its meaning. 3. The pain levels of neuropathic lesions and proprioceptive pain. 4. Types of pain; 11. Pathophysiology of kidney diseases: 1. Pathogenesis i mechanisms of proteinuria development. Proteinuria of glomerular origin. 2. Immunopathogenesis glomerular kidney disease. 3. Genetically determined diseases of the glomeruli. Gene mutations coding proteins for podocyte and basement membrane collagen as the cause of proteinuria. Goodpasture's disease and Alport syndrome as examples of diseases related to collagen abnormalities of the basal membrane. 4. Role autoantibodies in the development of kidney damage. 5. Pathogenesis of diseases of the tubulo-interstitial compartment. 6. Pathogenesis of acute kidney damage. 7. Hormones of renal origin and hormonal consequences kidney disease; 12. Pathophysiology of the aging process. Metabolism and bone diseases: 1. Vitamin D - normal level, forms of vitamin D, synthesis and physiological role. Vitamin D supplementation in the elderly - guidelines. 2. Osteomalacia - definition, diagnosis and treatment. 3. Osteopenia - definition, diagnosis and treatment. 4. Primary osteoporosis - definition, diagnosis and treatment. - densitometry - FRAX calculator - Fracture Risk Assessment Tool for bone fractures - treatment monitoring - drugs and their mechanisms, side effects of treatment and tips for patients how to take their medications. 5. Secondary osteoporosis - the most common causes and methods of prevention and treatment. 6. Osteoporosis and sarcopenia - fragility syndrome. 7. Paget's disease - an underestimated problem; 13. Diseases of the endocrine system: 1. The hypothalamic-pituitary-secret organ axis internal. 2. Pituitary gland deficiency and excess hormones. 3. Disorders of the thyroid gland, parathyroid glands, adrenal glands, gonads and endocrine pancreas; 14. Metabolic disorders - disorders in metabolism of carbohydrate, obesity, metabolic syndrome: 1. Pathogenesis of diabetes mellitus. 2. Pathophysiology of the obesity. Metabolic syndrome. SEMINARIES: 1. General pathophysiology part. 1: 1. Cell damage, pathomechanisms (reversible, irreversible, point of no return), ischemia - ischemic injury in reperfusion 2. Cell adaptation (hypertrophy, hypertplasia, metaplasia, atrophy) physiological vs. pathological. 3. Accumulation intracellular and cell aging. 4. Cell death (necrosis, apoptosis); 2. General pathophysiology part 2: 1. Injuries caused by internal and external pathogens. 2. Regeneration of cells and tissues, scar formation, fibrosis. 3. Environmental diseases and nutritional disorders. 4. Congenital diseases. 5. Disorders of thermoregulation; 3. The role of cytokines in the development of inflammation: 1. Pro-and anti-inflammatory cytokines 2. Receptors cytokines 3. The role of cytokines in diseases: - bronchial asthma - HIV infection - rheumatoid arthritis. 4. Cytokine storm in the course of macrophage activation syndrome; 4. Pathophysiology of the hematopoietic system: 1. Diseases of the red blood cells. 2 Diseases of the white blood cells. 3. Hemostasis disorders; 5. Pathophysiology of the cardiovascular system part. 1: 1. Arterial hypertension 2. Pulmonary hypertension. 3. The formation of murmurs. 6. Pathophysiology of the cardiovascular system - ECG part. 2: 1. Pathophysiology changes in the ECG recording; 7. Pathophysiology of the respiratory system: 1. Pathophysiology of the obstructive diseases in the respiratory system. 2. Pathophysiology of the restrictive diseases in the respiratory system. 3. Pathophysiology of interstitial diseases. 4. Respiratory failure; 8. Pathophysiology of the digestive system - part 1 digestive tract and pancreas: 1. Diarrhea. 2. Celiac disease. 3. Inflammatory bowel diseases. 4. Malnutritional disorders. 5. Chronic

Course/module:	Pathophysiology
Fields of education:	
Course status:	mandatory
Course group:	A - przedmioty podstawowe
ECTS code:	
Field of study:	Medicine
Specialty area:	Medicine
Educational profile:	General academic
Form of study:	full-time
Level of study:	uniform master's studies
Year/semester:	3 / 5
Type of course:	Classes, Seminar, Lecture
Number of hours per semester/week:	Classes: 20, Seminar: 27, Lecture: 28
Teaching forms and methods	Classes(K1, U1, W1) : Classes: Presentation of pathophysiology prepared by students cases of diseases in virtual patients and discussion , Seminar(K1, U1, W1) : Seminars: Overview and discussion of selected issues and cases with presentation , Lecture(K1, W1) : Lectures with presentations
Form and terms of the verification results:	CLASSES: Evaluation of the work and cooperation in the group - Classes evaluation is done on the of evaluation of presentation of the clinical cases on the scale of passed = 0 points / failed = - 5 points and "pretest" before classes. Final evaluation of classes is done by calculation of the arithmetic mean of the note from "Pretests" (5 test questions or descriptive),and evaluation of presentations (2-5), points are converted into notes ; (K1, U1, W1) ; SEMINAR: Colloquium test - Written tests - Passing the seminar will be on the basis of the arithmetic mean of the notes obtained from 3 Colloquiums (Tests), and from each Colloquium (Test) the student must receive a positive grade. True - False test. The test consists of 15 questions with 5 answers. Colloquium (Test) requires an achievement minimum 45 points (60%) ; (U1, W1) ; LECTURE: Written exam - Written examination - Exam it takes the form of a one-choice test. Test consists of 120 questions with 4 answers, from only 1 of which is correct. To pass achievement exam is required minimum 72 points (60%). For the exam are admitted students who passed lectures, seminars and exercises. (U1, W1)
Number of ECTS points:	5
Language of instruction:	English
Introductory courses:	Introductory subjects: anatomy, physiology, histology with cytophysiology and embryology, biochemistry, immunology
Preliminary requirements:	Realization of learning outcomes in the field of knowledge, skills and competence from previous years of study.
Name of the organizational unit offering the course:	Katedra Fizjologii i Patofizjologii Człowieka,

pancreatitis. 9. Pathophysiology of the digestive system - part. 2 liver: 1. Acute liver failure. 2. Fatty liver. 3. Cirrhosis of the liver. 4. Cholestasis. Jaundice. 5. Viral hepatitis. 6. Autoimmune diseases of the liver; 10. Pathophysiology of the excretory system: 1. Urinary tract infections, urinary system disorders. 2. Tumors and kidney cysts. 3. Chronic kidney disease. 4. Urolithiasis; 11. Pathophysiology of the endocrine system: 1. Nutrition and nutritional disorders. 2. Types of diabetes mellitus.

EDUCATIONAL OBJECTIVE:

Explanation and discussion of functional changes in the disease state, mechanisms of disease development and sequelae systemic disorders resulting from the disease. Students should learn about and use the basic terms used in the field of pathophysiology, know the basics of the etiopathogenesis of diseases in body systems; know pathomechanism of the consequences of disturbed functions of organs and systems, and be able to use the acquired knowledge in practice.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study: M/NM+++ , M/NMA_P7S_KR+ , M/NMA_P7S_UW+ ,

Codes of learning outcomes in a major area of study: B.W18.+ , C.U11.+ , C.U12.+ , C.U20.+ , C.W.32.+ , C.W.33.+ , C.W.34.+ , C.W14.+ , C.W23.+ , C.W27.+ , C.W28.+ , C.W29.+ , C.W30+ , C.W47.+ , C.W48.+ , C.W50.+ , D.U17.+ , K.5+ , K.7.+ , K.9.+ , KA7_KR1+ , KA7_UW1+ ,

LEARNING OUTCOMES:

Knowledge

W1 - In terms of knowledge, the graduate knows and understands: ways of communication between cells as well as between cells and the extracellular matrix, cell signaling pathways, and examples of disorders in these processes leading to the development of cancer and other diseases; processes: cell cycle, proliferation, cell differentiation and aging, apoptosis and necrosis and their role in body functions; the body's aging mechanism; the relationship between factors disturbing the biological and physiological homeostasis and pathophysiological changes; types of hypersensitivity reactions, types of immunity disorders and the basics of immunomodulation; issues in the field of cancer immunology; basic mechanisms of cell and tissue damage; clinical course of specific and non-specific inflammations and processes of the tissue and organ regeneration; definition and pathophysiology of shock, with particular emphasis on differentiation causes of shock and multi-organ failure; external and internal pathogens, modifiable and non-modifiable; clinical forms of the most common diseases of systems and organs, metabolic diseases and disorders of water and electrolyte imbalance, endocrine and acid-base imbalance; the influence of oxidative stress on cells and its importance in the pathogenesis of diseases and aging; the consequences of a deficiency of vitamins or minerals and their excess in the body; consequences improper nutrition, including prolonged starvation, excessive eating, unbalanced diet, and disorders of digestion and absorption of digestive products.

Skills

U1 - - In terms of skills, the graduate is able to: analyze reactive, defensive and adaptive phenomena and dysregulation caused by an etiological factor; describe changes in organism functioning in a situation of disturbed homeostasis, in particular to define its integrated response to physical exertion, exposure to heat and cold, loss of blood or water, sudden standing, moving from sleep-to-waking state; identify and discuss the pathomechanisms of the most common diseases based on the selected ones systems and organs.

Social competence

K1 - In terms of social competences, the graduate is ready to: perceive and recognize his own limitations and self-assessment of deficits and educational needs; use of objective sources information; observe and apply the principles of academic and professional ethics as well as professional image, academic, social and professionalism; inspire, be a leader and collaborate in a team interdisciplinary, in particular during PBL (Problem Based Learning) classes.

BASIC LITERATURE

1) Cumar, Cotran, Robbins, "Basic Pathology" , wyd. Saunders Elsevier , 2013 ; 2) S.Silbernagl, F. Lang , "Colour Atlas of Pathophysiology" , wyd. Thieme , 2000 ; 3) S.J.McPhee, G.D.Hammer , "Pathophysiology" a Lange medical book, wyd. McGraw-Hill Medical , 2013 ; 4) Lee-Elen Copstead, Jacquelyn Banasik, "Pathophysiology" , wyd. Elsevier , 2013

SUPPLEMENTARY LITERATURE

1) Robbins and Cotran, Atlas of Pathology, wyd. Saunders Elsevier , 2010 ; 2) H.J.Bruyere,jr. , "100 Case Studies in Pathophysiology" The point , wyd. Wolters Kluwer/Lippicott Williams&Wilkins Health , 2009 ; 3) Robbins and Cotran, "Pathology – flash cards" , wyd. Saunders Elsevier, 2010 ; 4) J. R.Levick, "An introduction to cardiovascular physiology" , wyd. Hodder Arnold London /Great Britain , 2010 ; 5) Robbins and Cotran, "Pathologic Basis of Diseases- professional edition", wyd. Saunders , 2010 ; 6) I. Damjanov, Pathophysiology, wyd. Elsevier-Urban Partner, 2010

Person in charge of the course:

lek. Łukasz Jaśkiewicz,

Course coordinators:

Notes:

Detailed description of the awarded ECTS points - part B

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PATHOPHYSIOLOGY **PATHOPHYSIOLOGY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: classes	20 h.
- participation in: seminar	27 h.
- participation in: lecture	28 h.
- consultation	5 h.
	80 h.

2. Student's independent work:

- - consultation -4 hours - preparation of the presentation given clinical cases for classes - 10 hours - preparation for the exam - 15 hours - preparation for colloquiums - 6 hours - self-study - 10 hours	45 h.
	45 h.

1 ECTS point = 25-30 h of the average student's work, number of ECTS points = 125 h : 25 h/ECTS = 5,00 ECTS
on average: **5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	3,20 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	1,80 ECTS points,