UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

Course sylabus – part A
Diagnostic Imaging 2/2

48SJ-DI22
2025Z
ECTS: 4.00

SUBJECT MATTER CONTENT:

Classes
Clinical, topographical and radiological anatomy in the field of neuroanatomy, anatomy of the head and neck, cardiovascular, digestive, genitourinary, as well as bones, joints and ligaments and muscles and breast – repetition and review. Diagnostic imaging and interpretation of selected clinical cases based on images of radiography (X-ray), CT, MR and their differential diagnosis in CNS, ENT, MSK, oncology and genitourinary system. Diagnostic imaging of stroke: cerebral ischemia and infarction, stroke evolution, role od CT/CTA and MRI in acute stroke. Lacunar infarcts. Basilar artery thromboembolic occlusion. Intracranial hemorrhage: CT and MRI appearance, hypertensive hemorrhage, tumor hemorrhage. Subarachnoid hemorrhage (SAH) and aneurysm types. Venous sinus thrombosis. Cranio-cerebral injuries: cortical contussion, diffuse axonal injury, epidural hematoma (EDH), subdural hematoma (SDH), subdural hygroma - diagnostic methods, radiological symptoms. Cerebral edema. Imaging and diagnostics as well as differentiation diagnosis of selected pathologies and diseases of the central and peripheral nervous system: neurodegenerative and inflammatory diseases, dementia, MS, and pathology of the area of the pituitary region. Diagnostic imaging radiological signs and DDx of the most common tumors in the brain and spine. Intervrtebral disc herniation, degenerative diseases and the most common pathologies of the spine. Diagnostic imaging of the head and neck organs and structures – diagnostic methods, indications and contraindications, the most important radiological symptoms and signs in selected pathologies in the area of the nose, ear, orbit, mouth, throat and larynx, including benign and malignant tumors. Diagnostic imaging of the breast diseases, diagnostic methods, indications and contraindications, selected clinical cases. Diagnostic imaging of the female and male genital organs, diagnostic methods, indications, contrindications for different diagnostic methods, radiological characteristic symptoms and signs and differential diagnosis in selected pathologies and diseases. Diagnostic imaging of the musculoskeletal system: the most important radiological symptoms and signs interpretation of radiological images in terms of degenerative, inflammatory, neoplastic (benign, malignant), metabolic changes. Diagnostic images in trauma, radiological characteristic of the most common fractures of bones. Osteoporosis, multiple myeloma and metastases - radiological symptoms and DDx. Diagnostic imaging of oncology: indications and contrindications, diagnosis and differentiation of pathology and interpretation of the important radiological symptoms in the most common cancers. Assessement of the staging methods of tumors and assessement and monitoring of treatment results in oncology. Emergency and interventional radiology. Pediatric diagnostic imaging: diagnostic methods, congenital anomalies and variants,

Legal acts specifying learning outcomes: 672/2020 (Medicine),
Status of the course: None
Group of courses: None
Discipline: Medicine
Classes:
Seminar (10 h)
Classes (40 h)
Step: Kierunek lekarski czwarty rok semestr siódmy (oferta w jęz. angielskim dla obcokrajowców)
Program: Medicine
Form of studies:full-time
Level of studies: uniform master's studies

Introductory subject: Anatomy, biophysics, pathophysiology, diagnostic imaging 1/2

Prerequisites: Review knowledge of anatomy, biophysics and pathophysiology

Coordinators:

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the most common diseases ans tumors in pediatrics radiological symptoms and signs and differential diagnosis in respiratory, digestive, cardiovasylar, urogenital and central nervous systems and MSK.

Seminar

Preventive health screening, Imaging and radiological screening tests with state of the art devices, early detaction and radiological symptoms in selected pathologies. Modern diagnostic methods in neuroradiology indications and contrindications. Stroke, cerebral ischemia and infarction, stroke evolution in MRI, interpretation, role od CT/CTA in acute stroke. Therapeutic options. Lacunar infarcts. Basilar artery thromboembolic occlusion. Intracranial hemorrhage: CT and MRI appearance, hypertensive and tumor hemorrhage. Subarachnoid hemorrhage and aneurysm types: saccular, fusiforme, giant, dissecting. Vascular malformation: AVM (parenchymal, dural), cavernous malformations, capillary teleangiectasia, venous anomaly. Amyloid angiopathy. Venous sinus thrombosis. Cranio-cerebral injuries: cortical contussion, diffuse axonal injury, epidural hematoma (EDH), subdural hematoma (SDH), subdural hygroma - diagnostic methods, radiological symptoms. Imaging and diagnostics as well as differentiation diagnosis of neurodegenerative and inflammatory diseases, dementia syndromes, MS, pituitary tumors and the area of the pituitary region. Diagnostic imaging radiological signs and DDx of the most common tumors in the brain and spine (astrocytoma, ependymoma, metastases). The most common diseases of the spine. Diagnostic images of head and neck organs and structures - diagnostic methods, indications and contraindications, the most important radiological symptoms in selected diseases. Diagnostics and differentiation as well as characteristic symptoms of pathology in the area of the nose, ear, orbit, mouth, throat and larynx, including benign and malignant tumors. Diagnostic imaging of developmental cysts originating from the pharyngeal arches. Imaging diagnosis of the breast diseases, diagnostic methods, including USG, MMG and MRI based on selected clinical cases. Indications and contraindications for breast diagnostic imaging examination. Indications for fine and core needle biopsy. Classification of changes and BI-RADS and ACR scale. Genitourinary system: diagnostic imaging of selected diseases, radiological signs and symptoms, indication and contrindication to different diagnostic methods. Interpretation of radiological images in the field of selected diseases of urinary system: kidney stones, hematuria, inflammatory changes and tumors. Diagnostics of selected diseases of female and male genital organs, including benign and malignant lesions. Musculoskeletal system diagnostic images, the most common and important radiological symptoms and signs of degenerative and inflammatory diseases and benign and malignant lesions and post-traumatic changes including fractures. Diagnostic imaging in oncology including the most common cancer with their staging, treatment methods and control imaging. Emergency radiology – indications, contrindications, diagnostic methods and radiological symptoms and signs, types and classifications of injuries of selected organs in imaging examinations. Interventional radiology – diagnostic methods, endovascular embolisation, angioplasty and vascular stents, percutaneous mechanical thrombectomy. Drainage of fluid spaces. Removal of foreign bodies. Ultrasound and CT guided biopsies. Pediatric diagnostic imaging: diagnostic methods, congenital anomalies and variants. Pediatric diagnostic imaging of respiratory system: lungs pathology, tracheo-bronchopulmonary malformation, airway foreign body, pulmonary sequestration, congenital lobar emphysema, aspiration pneumonia, respiratory distress syndrome

(RDS), hyaline membrane disease, meconium aspiration syndrome. Common mediastinal tumor. Thymus. Umbilical artery and vein. Gastrointestinal tract, congenital anomalies and the most common pathologies. Esophageal atresia, tracheo-esophageal fistula. Gastroesophageal reflux. Esophageal foreign body. Hypertrophic pyloric stenosis. Congenital duodenal atresia. Pylorospasm. Annular pancreas. Malrotation and midgut volvulus. Small bowel atresia. Meconium ileus. Intussusception. Appendicitis. Necrotizing enterocolitis (NEC). Hirschprung disease. Congenital anorectal anomalies. Radiological diagnosis of the most common pediatric tumors: hepatocellular carcinoma (HCC), Wilms tumor, neuroblastoma, rhabdoid tumor, rhabdomyosarcoma. Genitourinary tract: congenital anomaly, and variations. Urachus. Multicystic dysplastic kidney. Vesicoureteral reflux. Neonatal adrenal hemorhhage. Diagnostic imaging of musculoskeletal - trauma, Salter-Harris fractures, toddler's fractures, osteomyelitis, slipped capital femoral epiphysis. Diagnostic imaging od central nervous system: germinal matrix hemorhhage, cranial US, developmental anomalies of CNS, skull and vertebral column. Abused child syndrome – diagnostic imaging.

TEACHING OBJECTIVE:

Upon completion of this module, it is expected that the student is prepare to recognize and understand the different modern imaging methods in radiology, taking into account thephysical and technical basis of selected imaging tests and methods. Each student is allow tointerpret the basic physical phenomena used in radiology and diagnostic imaging. It is expected that the student should be able to recognize, describe and explain the most common pathologies and radiological signs and symptoms in the diagnosis of specific diseases of the central nervous system, gastrointestinal, genitourinary system, MSK and oncology based on the selected imaging cases. The student should acknowledge the role of radiologists in thediagnostic process of different pathologies, benign and malignant diseases as well as emergency and interventional radiology. Shaping the professional attitudes of students focusing on patient needs, possibilities of cooperation in an interdisciplinary team and an indication of the possibility of deepening and updating the knowledge of radiology and diagnostic imaging.

DESCRIPTION OF THE LEARNING OUTCOMES OF THE COURSE IN RELATION TO THE DESCRIPTION OF THE CHARACTERISTICS OF THE SECOND LEVEL LEARNING OUTCOMES FOR QUALIFICATIONS AT LEVELS 6-8 OF THE POLISH QUALIFICATION FRAMEWORK IN RELATION TO THE SCIENTIFIC DISCIPLINES AND THE EFFECTS FOR FIELDS OF STUDY:

Symbols for outcomes related to the discipline:

M/NM++++++++++++, M/NMA_P7S_KO+, M/NMA_P7S_KR+, M/NMA_P7S_UW++, M/NMA_P7S_WG+++++++++

Symbols for outcomes related to the field of study:

K.5.+, M/NM_K.8.+, M/NM_K.7.+, A.U4.+, B.U2.+, F.U7.+, M/NM_F.W10.+, KA7_WG1+, KA7_WG2+, M/NM_B.W8.+

LEARNING OUTCOMES (Knowledge, Skills, Social competence):

W1	The graduate knows and understands: F.W10. the issues of the contemporarily employed imaging tests, especially: 1)

	radiological symptomatology of the basic diseases, 2) the instrumental methods and imaging techniques used in medical surgeries, 3) the indications, contraindications, and patient preparation for individual types of imaging tests, and contraindications against the use of contrast agents;
W2	The graduate knows and understands: KA7_WG1 human body structure based on vital diagnostic examinations, in particular x-rays, ultrasound images, computed tomography and magnetic resonance imaging;
W3	The graduate knows and understands: KA7_WG2 physical basics of selected imaging techniques in medicine and the principles of radiological protection, including radioisotope, functional and structural diagnostics in nuclear medicine;
W4	The graduate knows and understands: B. W8. physical basics of chosen therapeutic techniques;
U1	The graduate is able to: A.U4. formulate conclusions as to the relations between anatomical structures based on intravital diagnostic tests, especially of the radiological type (plain film, tests with contrast agents, computer tomography, and nuclear magnetic resonance); B. U2. assess harmfulness of the doses of ionizing radiation on normal and pathologically altered tissues ofthe body and adhere to principles of the anti-radiation protection; F.U7. identify the most common types of fractures based on radiological examination, especially of long bones;
K1	the graduate is ready to: K.5. perceiving and recognizing own limitations and self-assessment of deficits and educational needs; M/NM_K.8. formulating conclusions from own measurements or observations; M / NM_K.7. use of objective sources of information;

TEACHING FORMS AND METHODS:

Classes-['W1', 'U1', 'K1', 'W2', 'W3', 'W4']-Interpretation of imaging studies from different clinical disciplines

Seminar-['W1', 'W2', 'W3']-Interactive discussion in small teaching group with interpretation of selected diagnostic imaging cases in various fields of clinical trials using the forms of problem based teaching. Various methods of imaging in diagnostic imaging - indications and contraindications in clinical practice - discussion. Analysis and interpretation of X-ray/CT/MRI/US images of selected pathologies of individual patient cases

FORM AND CONDITIONS OF VERIFYING LEARNING OUTCOMES:

Seminar-(Exam)-['W1', 'U1', 'W2', 'W3']-Exam - Final test: Theoretical part - 50 test questions without / using multimedia methods, credit from 60% and Practical part - 20 clinical cases in the form of OSCE using multimedia methods, credit from 60%

Classes-(Competention test)-['W1', 'U1', 'K1', 'W2', 'W3', 'W4']-Competention test - Evaluation of the work and cooperation in the group - Skills assessment discussion and cooperation in the group including the assessment of the various methods and skills during analysis of various clinical cases test. Final test with 20 clinical cases in the form of OSCE using multimedia methods, Passing from 60%

Literature:

1. ***Learning Radiology, 5th Edition. Recognizing the Basics***, Lange S. Walsh G.Herring

William, Elsevier, 2023, Strony: , Tom: (literatura podstawowa)

2. **https://radiologyassistant.nl** (literatura uzupełniająca)

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Detailed description of ECTS credits awarded - part B
Diagnostic Imaging 2/2

48SJ-DI22
2025Z
ECTS: 4.00

The number of ECTS credits awarded consists of:

1. Contact hours with the academic teacher:

- participation in: Seminar	10 h
- participation in: Classes	40 h
- consultation	5 h
	Total: 55 h

2. Independent work of a student:

student's own work	45.00 h
	Total: 45.00 h

Total (contact hours + independent work of a student): 100.00 h

1 ECTS credit = 25-30 h of an average student's work, number of ECTS,
ECTS Points = 100.00 h : 25 h/ECTS = **4.00** ECTS

Average: 4.00 ECTS

- including the number of ECTS credits for contact hours with the direct participation of an academic teacher	2.20 ECTS
- including the number of ECTS credits for hours of independent work of a student	1.80 ECTS