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|  | UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYNFaculty of Medicine |
|  | **Course sylabus – part A** |
| **48SJ-NUCMED** | **Nuclear Medicine** |
| **ECTS: 0.68**  |  |
| **CYCLE: 2023L** |  |

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| **SUBJECT MATTER CONTENT****LECTURE**Standard methods of radionuclide diagnostics in everyday clinical practice. (Theme includes issues clinical use of standard procedures for nuclear medicine in clinical practice). Radionuclide Diagnostics tumors / neuroendocrine tumors (NET / NEN) with regard to functional and structural diagnostics and image fusion of both types of research. Issues will include a wide range of clinical use of diagnostic imaging methods in an integrated specialist diagnosis of neuroendocrine tumors. The use of FDG-PET in oncology (clinical indications). Topic includes discussion of the recommendation of the use of FDG - PET in oncology based on Recommendation Polish developed using FDG-PET in oncology). Modern therapy with the use of radioisotopes, clinical indications and recommendations.**CLASSES**Classes with students on the state of knowledge in nuclear medicine to the field of nuclear medicine products in students the analytical skills of functional solutions with the potential use of imaging methods outlined in the wider diagnostic radioisotopes, as well as therapy using mainly beta emissions. As part of the practical classes will be presented in the form of audio-visual structure of the plant and standard nuclear medicine diagnostic and therapeutic procedures performed in the Nuclear Medicine. As part of the presentation will be presented the specifics of issues related to the implementation of scintigraphic studies, radioisotope labeling procedures and standard quality control performed in the Nuclear Medicine**TEACHING OBJECTIVE**The aim of the subject of nuclear medicine is to present the basics of diagnostics and radioisotope therapy (scintigraphy) used in everyday clinical practice. Classes are about presentation the current state of knowledge in the field of nuclear medicine with the development of analytical capabilities in students approach to functional (scintigraphic) diagnostics with the potential use of methods radioisotope in broadly understood imaging diagnostics as well as in therapy with the use of radioisotopes. The current state of knowledge on this subject will be synthetically presented to students, with intention deepen their knowledge and develop the possibility of a very broad, uninhibited approach to clinical issues related to diagnostic imaging. These classes will be an introduction to the potential the use of scintigraphic methods in the metabolic assessment of pathological changes, responses to the applied ones various methods of therapy and visual "follow-up".**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**:

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| **Symbols for outcomes related to the discipline:** | M/NM+++ |
| **Symbols for outcomes related to the field of study:**  | B.U3.+, KA7\_KR1+, KA7\_UW4+, M/NM\_F.W10.+, K.5.+, K.4.+, KA7\_WG2+, B.U2.+, B.U1.+, K.2.+ |

**LEARNING OUTCOMES:** **Knowledge:**

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| W1 – The student knows and understands the physical basis of selected imaging techniques in medicine and the principles of radiological protection, including radioisotope, functional and structural diagnostics in nuclear medicine |
| W2 – The student knows and understands the issues of modern imaging, in particular: 1) radiological symptomatology of basic diseases, 2) instrumental methods and imaging techniques used to perform medical procedures, 3) indications, contraindications and preparation of the patient for particular types of imaging and contraindications for the use contrast agents |

**Skills:**

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| U1 – The student is able to use the knowledge of the laws of physics to explain the influence of external factors, such as temperature, acceleration, pressure, electromagnetic field and ionizing radiation, on the body and its elements |
| U2 – The student is able to assess the harmfulness of the dose of ionizing radiation and adhere to the principles of radiological protection |
| U3 – The student is able to calculate the molar and percentage concentrations of compounds and the concentrations of substances in isosmotic, single and multi-component solutions |
| U4 – The student is able to understand the possibilities and needs of using e.g. scintigraphic examinations, radioisotope diagnostics in the diagnosis and treatment of selected oncological diseases, including indications and contraindications for diagnostic tests and treatment; |

**Social competence:**

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| K1 – The student is ready to be guided by the good of the patient |
| K2 – The student is ready to take action against the patient based on ethical principles, with awareness of social conditions and limitations resulting from the disease |
| K3 – The student is ready to see and recognize his own limitations and self-assess educational deficits and needs |
| K4 – The student is ready to observe and apply the principles of academic and professional ethics and professional image, academic, social and professional professionalism |

**TEACHING FORMS AND METHODS:**

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| Lecture(W1;W2;U1;U2;U3;U4;K1;K2;K3;K4;):Multimedia presentation |
| Classes(W1;W2;U1;U2;U3;U4;K1;K2;K3;K4;):Exercises on the basics of radioisotope diagnostics, specialized nuclear medicine procedures |

**FORM AND CONDITIONS OF VERIFYING LEARNING OUTCOMES:**

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| Lecture (Part in the discussion) - Obecność i aktywność na wykładach - |
| Classes (Competention test) - Competency test - the condition for passing is to obtain 60% of correct answers - |

**BASIC LITERATURE:**

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| 1. GJR Cook, MN Maisey, KE Britton V. Chengazi, *Clinical Nuclear Medicine*, Tom Tom t. by 4th, Wyd. Hodder Arnold, London, R. 2007 |
| 2. HJ Biersak LM Freeman, *Clinical Nuclear Medicine*, Wyd. Springer, R. 2011 |
| 3. Mayo Clinic, *Mannula of Nuclear Medicine*, Wyd. Churchill Livingstone, R. 1996 |

**SUPPLEMENTARY LITERATURE**:

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| 1. Official magazine Polskiego Towarzystwa Medycyny Nuklearnej, *Nuclear Medicine Review*, Wyd. Via Medica, R. 2022 |
| 2. Official magazine Europejskiego Towarzystwa Medycyny Nuklearnej, *European Journal of Nuclear Medicine and Molecular Imaging*, Wyd. Springer, R. 2022 |

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| **Legal acts specifying learning outcomes:** **672/2020****Disciplines:** medical sciences**Status of the course:**Obligatoryjny**Group of courses:**B - przedmioty kierunkowe**Code: ISCED** 0912**Field of study:**Medicine**Scope of education:****Profile of education:** General academic**Form of studies:** full-time**Level of studies**: uniform master's studies**Year/semester:** 3/6 |

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| **Types of classes:** Lecture, Classes**Number of hours in semester:**Lecture: 10.00, Classes: 5.00**Language of instruction:**English**Introductory subject:** **Prerequisites:** General knowledge of: anatomy, human histology, physiology and biochemistry, based on the knowledge acquired at the beginning of the process educating medical students is not specialist knowledge required narrow medical specialties |

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| **Name of the organisational unit conducting the course:**Katedra Kardiologii i Chorób Wewnętrznych**Person responsible for the realization of the course:**prof. dr hab. n. med. Jarosław Ćwikła**e-mail:** jbcwikla@interia.pl |

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| **Additional remarks:**  |

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**Detailed description of ECTS credits awarded - part B**

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| **48SJ-NUCMED****ECTS: 0.68****CYCLE: 2023L** | **Nuclear Medicine** |

The number of ECTS credits awarded consists of:

1. Contact hours with the academic teacher:

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| - participation in: Lecture | 10.0 h |
| - participation in: Classes | 5.0 h |
| - consultation | 2.0 |

Total: 17.0 h.

2. Independent work of a student:

Total: 0 h

contact hours + independent work of a student Total: 17.0 h

1 ECTS credit = 25-30 h of an average student’s work, number of ECTS credit = 17.0 h : 25.0 h/ECTS = 0.68 ECTS on average: 0.5 ECTS

- including the number of ECTS credits for contact hours with the direct participation of an academic teacher: 0,00 ECTS points,

- including the number of ECTS credits for hours of independent work of a student: