

(SYLABUS)

Name of the department / clinic providing the course:

Department of Nuclear Medicine

Course title: Nuclear Medicine I - principles of nuclear medicine and radiological protection.

Course profile: practical

Speciality: Nuclear Medicine

Course aims:

To get acquainted with:

- physiological, pathophysiological, physical and instrumentation determined bases of nuclear medicine.
- the most important diagnostic methods used in nuclear medicine as well as clinical indications for their application.
- the site and role of radionuclide procedures in diagnostic algorithms of selected disease entities.
- basic concepts of radiological protection of patients and staff working in nuclear medicine department.

Types of educational activities and number of hours allocated:

Subject	Seminar	ECTS points
Nuclear Medicine I	5 hours	

Names of course unit' s faculty:

Course coordinator: dr n. med. Paweł Cichocki, email:

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dr hab. n. med. Zbigniew Adamczewski, profesor uczelni, dr n. med. Paweł Cichocki

Prerequisites:

The student should have a basic knowledge of physics and biophysics, anatomy, physiology, pathophysiology and clinical subjects, especially internal medicine, pediatrics and oncology.

Should also have basic knowledge in medical diagnostic imaging methods, radiological, ultrasound and nuclear magnetic resonance.

Learning activities and teaching methods:

Seminars - lecture, multimedia based learning, demonstration, discussion.

Course unit content:

Topics:

1. Principles of nuclear medicine - 1 h
2. Radiofarmaceuticals, nuclear medicine instrumentation - 1 h
3. Principles of radiological protection - 1 h
4. Applications of nuclear medicine in cardiology and nephro-urology - 2 h

Course objectives:

Knowledge:

The expected outcome of nuclear medicine course is to acquire knowledge and understanding of basic concepts of nuclear medicine, namely:

To be able to define a concept of nuclear medicine.

To be able to define and explain the following concepts:

- radionuclides - to list radionuclides most widely used in diagnostic nuclear medicine.
- radiopharmaceuticals
- generation of scintigraphic (nuclear medicine) image.

To be able to discuss functions of nuclear medicine:

-diagnostic

- Imaging studies

a) Static studies - (planar and tomographic (SPECT, SPECT/CT and PET/CT)

b) Dynamic studies

- Non-imaging studies

-therapeutic

The expected outcome also includes acquiring knowledge of the most important radionuclide studies used in clinical practice. A student can:

- list nuclear medicine procedures and discuss mechanisms of revealing pathological changes.

- specify clinical indications for radionuclide diagnostic studies of:

- circulatory system
- respiratory system
- urinary system

- define roles and places of radionuclide studies in diagnostic algorithms.

The outcome of course also assumes knowledge and understanding of essentials of radiological protection. A student can:

- list primary types of ionizing radiation applied in medicine.
- define and explain the concepts of absorbed and effective dose of radiation.
- define and explain biological effects of human body irradiation.
- list and explain principles of patient radiological protection

Skills:

To develop basic skills of proper application of radionuclide studies.

A student can:

- select proper diagnostic procedures in particular clinical situations.
- interpret selected results of basic radionuclide studies juxtaposed to patient clinical status and results of other diagnostic methods.

Attitudes and transferrable (generic) competencies:

To develop the awareness of a physician's responsibility necessary in application of diagnostic methods using ionizing radiation.

A student acquires awareness of the necessity of competent application of radionuclide studies (applying proper study procedures, made from relevant indications) in order to assure a high diagnostic benefit along with a possibly low risk resulting from utilization of the ionizing radiation.

A student can explain and discuss principles of application of ionizing radiation in medical diagnostics:

- proper justification of diagnostic procedure
- optimal patient protection – exposing him to possibly low dose and, at the same time, ensuring credible study result (according to the ALARA - As Low As Reasonably Accessible-rule).

Required and recommended learning resources (readings):

Recommended:

Castellucci, P., et al., "European nuclear medicine guide." *A joint publication by EANM and UEMS/EBNM* (2020) (online version: <https://www.nucmed-guide.app/#!/startscreen>)

Assessment methods and criteria:

1. Presence at sessions.
2. Active participation in discussion.

Statement and signature of the course leader:

I hereby state that the content of the curriculum included in the syllabus below is the result of my individual work completed as part of work contract/cooperation resulting from a civil law contract, and that author rights to this title are not the property of a third party.