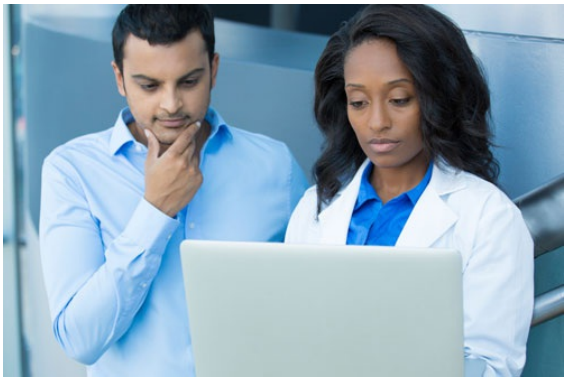
Professions in Nuclear Medicine

Nuclear Medicine Radiologist



Nuclear medicine radiologists, also called nuclear radiologists, are physicians who use radioactive materials, called radiopharmaceuticals (http://www.radiologyinfo.org) , to diagnose and treat disease. They employ such techniques as scintigraphy, which uses radiopharmaceuticals to produce images of the body's organs or to visualize certain diseases. These radioactive materials are typically injected into a patient's vein, but may also be inhaled or swallowed by the patient.

Nuclear medicine radiologists also utilize radiopharmaceuticals to treat hyperthyroidism (http://www.radiologyinfo.org) , thyroid cancer, solid tumors, hematologic malignancies, or painful bone metastases (http://www.radiologyinfo.org) .

After graduating from medical school, nuclear medicine radiologists must complete a four-year residency in diagnostic radiology and be trained in a wide variety of imaging techniques, including the diagnostic and therapeutic use of radioactive pharmaceuticals. Nuclear radiologists may also undergo one or more years of additional nuclear medicine training. All educational programs must be certified by the Accreditation Council for Graduate Medical Education (https://www.acgme.org/) (ACGME).

Nuclear Pharmacist

Nuclear pharmacists, once known as radiopharmacists, specialize in preparing, dispensing and distributing radiopharmaceuticals or radioactive drugs. They are part of the nuclear medicine team and provide consultation regarding health and safety issues. Nuclear pharmacists may work in a number of settings:

- Hospitals
- Nuclear pharmacies
- Industry
- Academia
- Government and private research institutes

Nuclear pharmacists:

- control the inventory of radioactive drugs and other supplies.
- prepare radiopharmaceuticals.
- fill prescription orders.
- check instruments and equipment for quality assurance purposes.
- properly handle dangerous substances and biological specimens.
- ensure that patients receive proper preparation before administering radiopharmaceutical materials.

A nuclear pharmacist may also take an active role in educating nuclear medicine technologists and/or nuclear medicine residents.

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In order to become a nuclear pharmacist one must receive the following training:

- 200 hours of classroom instruction in basic radioisotope handling techniques specifically applicable to the use of unsealed sources. Part of the training should include lectures and laboratory sessions on radiopharmaceutical chemistry, radiation physics and instrumentation, mathematics of radioactivity, radiation biology, and radiation protection.
- 500 hours in handling unsealed radioactive material under a qualified instructor.

All nuclear pharmacists must attend an institution with a nuclear pharmacy program and obtain certification through the Board of Pharmaceutical Specialties (https://www.bpsweb.org/) (BPS). Nuclear pharmacists are then considered Board Certified Nuclear Pharmacists (BCNP).

Nuclear Medicine Physicist

Nuclear medicine physicists work with nuclear imaging instrumentation and radiation dosimetry. They are considered experts in dealing with the interactions between ionizing radiation and matter. Many of them also have expertise in computer science and image processing. As an integral part of the nuclear medicine team, the physicist provides assistance with the physical aspects of new applications for nuclear medicine and can perform tests on new equipment, develop and maintain a quality control program for equipment, make dosimetric calculations or create computer programs for clinical use.

A nuclear medicine physicist with expertise in image reconstruction and data analysis is able to assist in determining the best possible approaches for processing various kinds of nuclear medicine studies.

Nuclear medicine physicists traditionally work in research labs where they develop new instrumentation and data analysis approaches for future generations of nuclear and molecular imaging.

To guarantee proper safety of patients, co-workers, staff and the public, many nuclear medicine physicists are involved with radiation protection work.

The role of a nuclear medicine physicist requires a solid scientific background, a capacity for innovation, attention to detail and most of all, the capability to work within a multidisciplinary team of technologists, clinicians, pharmacists and nurses.

Prior to becoming a nuclear medicine physicist, one usually undergoes general training as a medical physicist.

Nuclear medicine physicists have a master's or doctorate degree in one of the following fields:

- Physics
- Medical Physics
- Radiologic Physics
- Engineering
- Applied Mathematics
- Other physical sciences

To become certified, nuclear medicine physicists must complete two to three years of clinical experience and training. They can obtain certification in Nuclear Medicine Physics or Radiation Protection through the American Board of Science in Nuclear Medicine (https://www.absnm.org/) or in Medical Nuclear Physics through the American Board of Radiology (https://www.theabr.org/) (ABR).

Nuclear Medicine Technologist

A nuclear medicine technologist works closely with the nuclear medicine radiologist. The technologist may prepare and administer

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radiopharmaceuticals, perform imaging procedures, enhance images utilizing a computer and analyze biologic specimens.

During an imaging procedure, the nuclear medicine technologist works with the patient. The technologist obtains important patient history, describes imaging procedures and answers questions, monitors the physical condition of the patient during procedures and takes note of patient comments that may be useful to the physician in interpreting procedure results.

A nuclear medicine technologist is able to work in any of the following clinical settings:

- Community hospitals
- Outpatient imaging centers
- Public health facilities
- University-affiliated teaching hospitals and medical institutions
- Government and private research institutes

There are also several areas of concentration on which they may focus:

- Research technologist
- Senior staff technologist
- Technologist program educator
- Hospital administrator
- Chief technologist
- Team leader, lead or supervisor
- Industry sales representatives, technical specialist or research-and-development specialist

Typically, one who is interested in becoming a nuclear medicine technologist has a background in science and math, as well as an interest in working with patients. Three programs in particular are offered:

- Post-baccalaureate one-year certificate programs
- Two-year associate degree
- Four-year bachelor's degree

With additional training, a technologist can specialize and work almost exclusively with specialized radiographic equipment, such as PET/CT.

Nuclear medicine technologists are certified by the American Registry of Radiologic Technologists (https://www.arrt.org/) (ARRT) and the Nuclear Medicine Technology Certification Board (http://www.nmtcb.org/) (NMTCB).

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