

Nuclear Medicine Technologist

Professional Activities

In nuclear medicine, radionuclides—unstable atoms that emit radiation spontaneously—are used to diagnose and treat disease. Radionuclides are purified and compounded to form radiopharmaceuticals. Nuclear medicine technologists administer radiopharmaceuticals to patients and then monitor the characteristics and functions of tissues or organs in which the drugs localize. Abnormal areas show higher-than-expected or lower-than-expected concentrations of radioactivity. Nuclear medicine differs from other diagnostic imaging technologies because it determines the presence of disease on the basis of metabolic changes, rather than changes in organ structure.

Nuclear medicine technologists operate cameras that detect and map the radioactive drug in a patient's body to create diagnostic images. After explaining test procedures to patients, technologists prepare a dosage of the radiopharmaceutical and administer it by mouth, injection, inhalation, or other means. They position patients and start a gamma scintillation camera, or “scanner,” which creates images of the distribution of a radiopharmaceutical as it localizes in and emits signals from the patient's body. The images are produced on a computer screen or on film for a physician to interpret.

When preparing radiopharmaceuticals, technologists adhere to safety standards that keep the chance of radiation exposure as low as possible to workers and patients. Technologists keep patient records and document the amount and type of radionuclides that they receive, use, and discard.

There are two areas of specialty for nuclear medicine technologists—nuclear cardiology and positron emission tomography (PET). Nuclear cardiology typically involves myocardial perfusion imaging, which, like most nuclear medicine, uses radiopharmaceuticals and cameras to image the body. Myocardial perfusion imaging, however, requires that patients perform exercise so the technologist can image the heart and blood flow. Technologists specializing in PET operate a special medical imaging device that produces a 3-D image of the body.

Physical stamina is important because nuclear medicine technologists are on their feet much of the day and may have to lift or turn disabled patients. In addition, technologists must operate complicated equipment that requires mechanical ability and manual dexterity.

Although the potential for radiation exposure exists in this field, it is minimized by the use of shielded syringes, gloves, and other protective devices and by adherence to strict radiation safety guidelines. The amount of radiation in a nuclear medicine procedure is comparable to that received during a diagnostic x ray procedure. Technologists also wear badges that measure radiation levels. Because of safety precautions, badge measurements rarely exceed established safety levels.

Nuclear medicine technologists generally work a 40-hour week. Some technologists also may have on-call hours, including evening or weekend hours, in departments that operate on an extended schedule. Opportunities for part-time and shift work also are available. Those employed by mobile imaging services may be required to travel to several locations.

Educational Requirements

Nuclear medicine technology programs range in length from 1 to 4 years and lead to a certificate, an associate degree, or a bachelor's degree. Many employers and an increasing number of States require certification or licensure. Aspiring nuclear medicine technologists should check the requirements of the State in which they plan to work. The Joint Review Committee on Education Programs in Nuclear Medicine Technology accredits associate and bachelor's degree training programs in nuclear medicine technology.

Generally, certificate programs are offered in hospitals, associate degree programs in community colleges, and bachelor's degree programs in 4-year colleges and universities. Courses cover the physical sciences, biological effects of radiation exposure, radiation protection and procedures, the use of radiopharmaceuticals, imaging techniques, and computer applications.

One-year certificate programs are typically for health professionals who already possess an associate or bachelor's degree—especially radiologic technologists and diagnostic medical sonographers—but who wish to specialize in nuclear medicine. The programs also attract medical technologists, registered nurses, and others who wish to change fields or specialize.

Requirements for licensure of nuclear medicine technologists vary from State to State, so it is important that aspiring technologists check the requirements of the State in which they plan to work. Many third-party payers require nuclear medicine technologists to be certified in order for the healthcare facility to receive reimbursement for imaging procedures.

Academic Programs

[College of DuPage](#)

[Lewis University](#)

[North Central College](#)

[Triton College](#)

[University of St Francis](#)

Employment/Salary Outlook

Growth will arise from technological advancement, the development of new nuclear medicine treatments, and an increase in the number of middle-aged and elderly persons, who are the primary users of diagnostic and treatment procedures.

Technological innovations may increase the diagnostic uses of nuclear medicine. New nuclear medical imaging technologies, including PET and single photon emission computed tomography (SPECT), are expected to be used increasingly. Cost considerations will affect the speed with which these new applications of nuclear medicine grow. Healthcare facilities contemplating these procedures will have to consider equipment costs, reimbursement policies, and the number of potential users. Although these new imaging technologies will be used more often, they will likely replace older technologies, not supplement them. Thus, only a small amount of job growth will stem from the adoption of new technologies.

State and National Wages

Location	Pay Period	2021		
		Low	Median	High
United States	Hourly	\$29.11	\$37.86	\$50.74
	Annual	\$60,550	\$79,660	\$105,530
Illinois	Hourly	\$31.46	\$38.30	\$48.26
	Annual	\$65,440	\$79,660	\$100,380

State and National Trends

United States	Employment		Percent Change	Job Openings ¹
	2021	2031		
Nuclear Medicine Technologists	18,900	19,200	2%	1,000
Illinois	Employment		Percent Change	Job Openings ¹
	2020	2030		
Nuclear Medicine Technologists	770	800	4%	60

¹Job Openings refers to the average annual job openings due to growth and net replacement.

Professional Organizations

Society of Nuclear Medicine-Technologist Section (snm.org)

Nuclear Medicine Technology Certification Board (nmtcb.org)

Joint Review Committee on Educational Programs in Nuclear Medicine Technology (jrcnmt.org)

References

Occupational Outlook Handbook, U.S. Department of Labor, Bureau of Labor Statistics
(<http://www.bls.gov/ooh/healthcare/nuclear-medicine-technologists.htm>)

O*NET OnLine (<http://online.onetcenter.org/link/summary/29-2033.00>)

Last Modified November 2, 2022