SOCIETY OF NUCLEAR MEDICINE & MOLECULAR IMAGING
TECHNOLOGIST SECTION

August 12, 2024

Jeongsoo Kim
Office of Management and Budget
New Executive Office Building
Washington, DC 20503

Re: Docket ID (BLS–2024–0001) Standard Occupation Classification (SOC)—Updates for 2028 (29-2033 – Nuclear Medicine Technologist)

Dear Standard Occupational Classification Policy Committee (SOCPC),

On behalf of the Society of Nuclear Medicine and Molecular Imaging (SNMMI), a nonprofit scientific and professional organization representing over 14,000 members worldwide, we urge the OMB to recognize the vital role of Nuclear Medicine Technologists in the evolving landscape of diagnostic and therapeutic precision medicine and, in turn, formally recognize NMT's as professionals.

Currently categorized under 29-200 Health Technologists and Technicians (specifically 29-2033 – Nuclear Medicine Technologists) in the 2018 Standard Occupational Classification System, Nuclear Medicine Technologists are currently not considered professionals. This categorization does not support the critical roles and responsibilities of Nuclear Medicine Technologists, despite their being entrusted with the safe use of ionizing and nonionizing radiation for molecular imaging, therapies with radiopharmaceuticals, and research purposes. The expertise and the complexity of the work of Nuclear Medicine Technologists clearly align with a professional classification.

Since the 2018 SOC System was approved and published, the field of nuclear medicine and theranostics (the use of radioactive materials, called radiopharmaceuticals or radiotracers, to treat disease processes) continues to advance, forcing the role of Nuclear Medicine Technologists to expand and grow tremendously, particularly in areas that require continuing education in both diagnostic and therapeutic nuclear medicine. These advancements have provided more strategic personalized medicine creating a greater emphasis on patient care as well as radiation safety, reflecting the increased expectations placed on nuclear medicine technologists in today's healthcare environment. Recognizing Nuclear Medicine Technologists as professionals is essential to align with these higher standards and the critical contributions they make to patient care.

Specifically, the SNMMI-TS would like the following considerations from the SOC during the review process:

1. **Proposed Occupational Title –**Nuclear Medicine Technologist and Therapist
    a. Move from 29-200 Health Technologists and Technicians to 29-100 Healthcare Practitioners and Technical Occupations.
    b. This new title would clearly delineate the difference between a technician, someone who is not responsible for the diagnosis and treatment of patients, and a technologist, someone who has the education, training, experience and critical thinking to perform diagnostic and therapeutic procedures on patients and to be fully integrated in the patients' management teams.

2. **Description of the Nature of the Work Performed**
    a. <u>Duties Performed / Required Duties</u>
    Nuclear medicine technology is a sophisticated area of health care that helps physicians diagnose, evaluate, treat and monitor serious conditions—including cancer and heart disease. As a technologist

in this field, individuals create important diagnostic images and treat patients using radiopharmaceutical therapies. Responsibilities include preparing and injecting radiopharmaceutical agents into patients, then using a scanner or camera to capture images. In addition, Nuclear Medicine Technologists review the patient's medical history to understand the patient's illness, medical issue, and pending diagnostic or treatment procedure; instruct the patient before, during, and following the procedure; evaluate the satisfactory preparation of the patient before beginning a procedure; and recognize emergency patient conditions and initiate lifesaving first aid when appropriate. Nuclear Medicine Technologists demonstrate critical thinking and independent judgment in their daily responsibilities, providing precise and reliable information that supports patient care. Their ability to assess complex situations and make informed decisions is crucial for the effectiveness of patient care teams.

b. Frequent Duties Not Performed by All

Administrative functions may include supervising other technologists, students, and other personnel; participating in procuring supplies and equipment; documenting laboratory operations; participating in radiation safety protocols and taking an active role in radiation reduction programs; participating in departmental inspections conducted by various licensing, regulatory, and accrediting agencies; participating in departmental quality assurance or quality improvement projects; and participating in scheduling patient procedures.

c. Supervisory and Management Duties

Supervising other technologists, students, and other personnel; participating in departmental inspections conducted by various licensing, regulatory, and accrediting agencies; participating in departmental quality assurance or quality improvement projects;

d. Work Described in SOC Definition is **NOT** Accurate and Up to Date

The current definition in the SOC is NOT accurate and must be updated. Both the current and proposed revised definitions are included below:

- **Current Definition**: Prepare, administer, and measure radioactive isotopes in therapeutic, diagnostic, and tracer studies using a variety of radioisotope equipment. Prepare stock solutions of radioactive materials and calculate doses to be administered by radiologists. Subject patients to radiation. Execute blood volume, red cell survival, and fat absorption studies following standard laboratory techniques.
  Illustrative examples: *Certified Nuclear Medicine Technologist, Nuclear Cardiology Technologist, Radioisotope Technologist*
- **PROPOSED Definition**: A highly specialized healthcare professional who prepares and administers radioactive drugs, known as radiopharmaceuticals, performs patient imaging procedures using diagnostic imaging equipment, accomplishes computer processing and image enhancement, provides images, data analysis, and patient information to the physician, administers doses of radiation to patients internally to treat medical conditions.
  Illustrative examples: *Certified Nuclear Medicine Technologist and Therapist, Nuclear Cardiology Technologist, Radioisotope Technologist*

References:

- NMT Scope of Practice - https://s3.amazonaws.com/rdcms-snmmi/files/production/public/NMT%20Scope%20of%20Practice%20and%20Performance%20Standards%202nd%20Ed-2022%20Complete-Approved_6-9-22.pdf
- NMTCB 2023 Job Task Analysis - https://www.nmtcb.org/documents/resources/NMTCB-CNMT-Job-Task-Analysis-Report-2023_Full-Report-w-Appendices.pdf
- ARRT 2022 Task Inventory - https://assets-us-01.kc-usercontent.com/406ac8c6-58e8-00b3-e3c1-0c312965deb2/70ed3e2f-23b1-4c10-bfc0-d8ae4d29893b/NMT_TI_2022.pdf

- Journal of Nuclear Medicine Technology (JNMT); SNMMI Clinical Trials Network Research Series for Technologists: An Introduction to Conducting Theranostic Clinical Trials - https://tech.snmjournals.org/content/early/2024/01/09/jnmt.123.266588
- Explore Health Careers - https://explorehealthcareers.org/career/allied-health-professions/nuclear-medicine-technologist/

3. Description of the Relationship to other SOC Occupations

Nuclear Medicine Technologists are currently grouped under Health Technologists and Technicians (29-200): Diagnostic Related Technologists and Technicians (29-2030). However, the difference between the Nuclear Medicine Technologists and most of the other occupations, is that Nuclear Medicine Technologists inject patients with a radiopharmaceutical drug, including those administered for therapeutic purposes. . Specifically, the occupations in other categories do not inject patients or have a limited treatment scope:

- 29-2010 Clinical Laboratory Technologists and Technicians – not permitted to inject or treat the patient
- 29-2040 Emergency Medical Technicians and Paramedics – have limited scope and oversight of the patient, are not permitted to inject radiopharmaceuticals.
- 29-2050 – Health Practitioner Support Technologists and Technicians - not permitted to inject or treat the patient
- 29-2060 Licensed Practical and Licensed Vocational Nurses - have limited scope and oversight of the patient, are not permitted to inject radiopharmaceuticals.
- 29-2070 Medical Records Specialists - not permitted to inject or treat the patient
- 29-2080 Opticians, Dispensing - not permitted to inject or treat the patient
- 29-2090 Miscellaneous Health Technologists and Technicians - have limited scope and oversight of the patient, are not permitted to inject radiopharmaceuticals.

Nuclear Medicine Technologists undergo rigorous education and training to operate diagnostic imaging equipment, administer radioactive materials, and ensure patient safety during diagnostic and therapeutic processes. Their work demands precision, attention to detail, and strict adherence to safety protocols to uphold the highest standards of care. Since the 2018 SOC System was released, the field of Nuclear Medicine has grown tremendously and with the addition of theranostics the need for Nuclear Medicine Technologist professionals is more important than ever. Theranostics is used to describe the ability to combine a radioactive drug tagged to a receptor found on a tumor cell membrane to image the tumor cell and a therapeutic radionuclide (e.g., ^{177}Lu or ^{90}Y) tagged to the same receptor to target and kill the tumor cell.

Reference:

- Journal of Nuclear Medicine Technology – Theranostics: The Future of Molecular Imaging and Therapy - https://tech.snmjournals.org/content/jnmt/50/3/local/complete-issue.pdf

Does the same or similar work appear in other SOC occupations?

YES, the evolving role of Nuclear Medicine Technologists, particularly with the rise of radiopharmaceutical theranostic procedures, underscores the need for increased specialization and recognition akin to radiation therapists. Both professions are critical for safe and effective therapeutic treatments, ultimately improving patient outcomes. Specifically, the SOC definition of the Radiation Therapy (29-1124) - *Provide radiation therapy to patients as prescribed by a radiation oncologist according to established practices and standards. Duties may include reviewing prescription and diagnosis; acting as liaison with physician and supportive care personnel; preparing equipment, such as immobilization, treatment, and protection devices; and maintaining records, reports, and files. May assist in dosimetry procedures and tumor localization* – is very similar to that of the Nuclear Medicine Technologist. Nuclear Medicine Technologists provide radiopharmaceuticals to patients as prescribed by the Nuclear Medicine Physicians and/or Radiologist. Nuclear Medicine Technologists must review the prescription, diagnosis and patient history as well as adverse events experienced by the patient due to treatment. Technologists must prepare equipment, conduct quality control

and radiation safety processes and maintain impeccable records, reports and files.

What changes should be made to existing SOC occupations that have the same or similar work?
We do not recommend any changes to existing SOC occupations that have the same or similar work. However, we recommend that Nuclear Medicine Technologists be recognized at the same level, professional status, as that of Radiation Therapist, of which the job duties and description are nearly identical.

4. Job Titles

Nuclear Medicine Technologists are most often referred to as Technologists. However, there are career advancement and literal opportunities that provide different title options, those are listed below.

a. Hospital Administrator
b. Educator
c. Nuclear Medicine Advanced Associate
d. Physicist Assistant
e. Radiation Safety Officer
f. Radiopharmacy Technologist
g. Supervising Technologist
h. Technical Specialist

Titles may vary slightly based on geographical region, however, the job titles outlined above comprise most job titles.

5. Number of Jobs or Workers

According to the Nuclear Medicine Technologist Certification Board (NMTCB) there are 21,614 active Certified Nuclear Medicine Technologists with an additional 600+ sitting for the exam each year. The American Registry of Radiologic Technologists (ARRT) reported 11,597 registered nuclear medicine technologists in 2024.

6. Types of Employers

a. Clinic – Private Practice
b. Community Based Hospital
c. Education – University or Community College
d. Government and Private Research Institutes
e. Hospital
f. Hospital-Owned Clinical
g. Industry/Private Sector
h. Mobile Unit

7. Education and Training

Education Requirements - Nuclear Medicine Technologists may complete an accredited post-baccalaureate certificate program, an associate's degree, a bachelor's degree or a master's degree. Didactic courses include but are not limited to the physical sciences, biological effects of radiation exposure, radiation protection, radiation procedures, CT anatomy and physics, the use of radiopharmaceuticals, adjunctive medications, imaging medication, imaging techniques, and computer applications. A structured clinical education component provides experience in the clinical environment. Clinical education is designed to meet the requirements of the certification exams. Graduates of accredited programs are eligible to sit for certification examinations offered by the NMTCB, ARRT, CAMRT and/or any other certification board accepted by your state or institution. The Joint Review Committee on Education Programs in Nuclear Medicine Technology accredits training programs in nuclear medicine technology.

More than 63 accredited Nuclear Medicine Technology programs currently offer instruction and clinical internship. General prerequisites depend on the type of program offered, but typically include a background

in science and mathematics and an interest in working with patients. Programs available include:

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

Significant advancements in the industry have not only expanded the curriculum but have also raised the educational standards, with many Nuclear Medicine Technologists now holding a bachelor's degree to meet entry-level requirements. Of the 68 accredited programs, 40% award bachelor's degrees, and 2% offer master's degrees. According to the 2023 Nuclear Medicine Technologist Certification Board Job Analysis Study, more than 67% of practicing Technologists have earned a bachelor's degree or higher.

References:

- Joint Review Committee on Educational Programs in Nuclear Medicine Technology - https://www.jrcnmt.org/programs/
- Nuclear Medicine Technology Competency Based Curriculum Guide (6th Edition) - https://s3.amazonaws.com/rdcms-snmmi/files/production/public/SNMMI-TS_NMT_Comptency_Curriculum_6thEdition_2022_PrintVersion.pdf
- NMTCB 2023 Job Task Analysis - https://www.nmtcb.org/documents/resources/NMTCB-CNMT-Job-Task-Analysis-Report-2023_Full-Report-w-Appendices.pdf

Certification Requirements – Certification is available from the Nuclear Medicine Technology Certification Board (NMTCB), The American Registry of Radiologic Technologists (ARRT), The Canadian Association of Medical Radiation Technologists (CAMRT) and/or any other certification board accepted by the state or institution.

a. NMTCB offers multiple professional certification programs for technologists to enter and advance in the nuclear medicine and molecular imaging profession. NMTCB's Certified Nuclear Medicine Technologist (CNMT) certification program has earned accreditation from the National Commission for Certifying Agencies (NCCA), the accrediting body of the Institute for Credentialing Excellence (ICE). Individuals who successfully pass the NMTCB's certification examination and maintain an active certification may use the CNMT abbreviations to indicate their specific credential.
b. ARRT The primary eligibility pathway is how the majority of people earn their first ARRT credential. It includes completing an ARRT-approved educational program. In order to meet the education requirement for the primary pathway, you must have: Earned an associate's degree or higher and Completed an ARRT-approved educational program in the same discipline as the credential you are pursuing.
c. CAMRT allows graduates of a Canadian accredited MRT education program who have graduated within the last 5 years OR Internationally Educated Medical Radiation Technologists who have had their education and experience assessed and who have been approved to access the certification exam by CAMRT or by a provincial regulatory body to sit for the CAMRT Nuclear Medicine exam.

References:

- Nuclear Medicine Technology Certification Board (NMTCB) - https://www.nmtcb.org/exams/nuclear-medicine/
- The American Registry of Radiologic Technologists (ARRT) – https://www.arrt.org/pages/earn-arrt-credentials/credential-options/nuclear-medicine-technology
- The Canadian Association of Medical Radiation Technologists (CAMRT) - https://www.camrt.ca/certification-4/

Continuing Education Requirements - In addition to the general certification requirements, certified Nuclear Medicine Technologists also must complete a certain number of continuing education hours per year, to maintain certification. Continuing education is required because of the frequent technological and radiopharmaceutical innovations.

References:

- NMTCB Continuing Competence Policy - https://www.nmtcb.org/policies/continuing-competence
- ARRT Maintaining Your Certification and Registration - https://www.arrt.org/pages/earn-arrt-credentials/ongoing-requirements

8. Licensing

Requirements for licensure of all imaging technologists vary from state to state, so it is important that technologists check the requirements of the state in which they plan to work. Licensure is defined as any form of permission granted by state to practice; states varying in terminology: license, certificate, permit. Standard means that a regulatory board has required some education and training to be allowed to practice (usually national credentials).

References:

- ASRT States that Regulate - https://www.asrt.org/main/standards-and-regulations/legislation-regulations-and-advocacy/states-that-regulate

9. Tools and Technologies

Nuclear Medicine Technologists are responsible for many different types of diagnostic imaging tools and technologies, including:

a. Diagnostic Imaging: Diagnostic imaging uses technologies such as x-ray, CT, MR, ultrasound, general nuclear medicine, positron emission tomography (PET), and single-photon emission computed tomography (SPECT) to provide physicians with a way to look inside the body without surgery.
b. Imaging Device: A technological apparatus used to produce detailed images of the inside of the body for diagnostic, therapeutic, or research purposes. Examples of these devices include the gamma camera, CT scanner, PET scanner, MR unit, optical imaging detector, and ultrasound device.
c. Molecular Imaging: Molecular imaging is an array of non-invasive, diagnostic imaging technologies that can create images of physical, functional, and anatomical aspects of the living body at a molecular level. Molecular imaging technologies include, but are not limited to, nuclear medicine, optical imaging, spectroscopy, PET, and SPECT.
d. Positron Emission Tomography: Positron emission tomography is a medical imaging technology using radiopharmaceuticals emitting positrons that annihilate into two photons. These photon pairs are detected by the PET scanner to produce images.
e. Positron Emission Tomography/Computed Tomography: A PET/CT is a combination of PET (Positron Emission Tomography) and CT (Computed Tomography). Computed Tomography is a medical imaging technology that uses a computer to acquire a volume of x-ray–based images, generally reconstructed as two-dimensional (2D) or three- dimensional (3D) pictures of inside the body.
f. Positron Emission Tomography/Magnetic Resonance Imaging: PET/MR is a combination of PET (Positron Emission Tomography) and MR (Magnetic Resonance Imaging). Magnetic resonance (MR) imaging is a diagnostic scan that uses high-strength magnetic fields and radio frequency transmission rather than ionizing radiation. MR imaging techniques are used primarily to study anatomy, but a special type of MR scan, functional MR imaging (fMRI), can be used to map blood flow for functional studies.
g. Radiopharmaceuticals: Radioactive chemicals used to diagnose, treat, or prevent disease.
h. Single Photon Emission Computed Tomography: SPECT imaging uses a gamma camera to acquire multiple 2-D images (projections) from multiple angles. Tomographic reconstruction algorithms are applied to the multiple projections, yielding a 3-D dataset. This dataset may then be manipulated to show thin slices along any chosen axis of the body, similar to those obtained from other tomographic techniques, such as CT, PET and MRI.
i. Single Photon Emission Computed Tomography/ Computed Tomography: A SPECT/CT is a

combination of a SPECT (Single Photon Emission Computed Tomography) scan with a CT (Computed Tomography) scan. Computed Tomography is a medical imaging technology that uses a computer to acquire a volume of x-ray–based images, generally reconstructed as two-dimensional (2D) or three-dimensional (3D) pictures of inside the body.

j. Radiation Safety: Involves practicing techniques that will minimize radiation exposure to the patient, health care personnel, and public. These include using protective devices, shields, dose reduction, and monitors consistent with ALARA principles. Establishing protocols for managing spills and unplanned releases of radiation.

10. Professional Trade Associations and Unions

There are two main Professional Medical Associations that represent Nuclear Medicine Technologists; SNMMI and ASRT. In addition, there is a sub-specialty Professional Medical Association, ASNC, that also represents a specialized group of nuclear cardiology technologists. Websites for each are below.

a. Society of Nuclear Medicine and Molecular Imaging (SNMMI) – www.snmmi.org
b. American Society of Radiologic Technologists (ASRT) - www.asrt.org
c. American Society of Nuclear Cardiology (ASNC) - www.asnc.org

Some nuclear medicine technologists may have the opportunity to join a union based on the geographical location and type of employer. There is not a national union for Nuclear Medicine Technologists.

11. STEM Categories

The current proposal for STEM categories within the SOC (as identified in Attachment B) has included 29-2000 Health Technologists and Technicians under Science-and Engineering – Related Domain. Due to the growing sophistication of diagnostic imaging equipment and the need to understand dosimetry as it relates to therapeutic treatment of disease, Nuclear Medicine Technologists must have a strong Mathematics background and an understanding of Information Technology. In addition, radiopharmaceuticals are administered based on pharmacokinetics, metabolism of the subject and the pharmacodynamics of the radiopharmaceutical. Based on these nuances, we recommend that the new SOC category for Diagnostic and Therapeutic Technologists be moved to the Science, Engineering, Mathematics and Information Technology Domain under the STEM Category.

References:

- Nuclear Medicine Technology Competency Based Curriculum Guide (6th Edition) - https://s3.amazonaws.com/rdcms-snmmi/files/production/public/SNMMI-TS_NMT_Comptency_Curriculum_6thEdition_2022_PrintVersion.pdf

In conclusion, the continuous learning, critical thinking, and professional judgment of Nuclear Medicine Technologists are indispensable to the advancement of personalized precision medicine and high-quality patient care. We respectfully urge the Office of Management and Budget to recognize the importance of designating Nuclear Medicine Technologists as professionals by supporting efforts to formalize their status within the healthcare industry with a reorganization of the current SOC system.

Sincerely,

Cathy Sue Cutler, PhD, FSNMMI
SNMMI President

Julie Dawn Bolin, MS, CNMT, FSNMMI-TS
SNMMI-TS President