Nuclear Medicine Technology

1. Introduction

ARRT requires candidates applying for certification and registration under the primary eligibility pathway to meet the Professional Education Requirements specified in the *ARRT Rules and Regulations*. ARRT's *Nuclear Medicine Technology Didactic and Clinical Competency Requirements* are one component of the Professional Education Requirements.

ARRT periodically updates the requirements based on a practice analysis, which is a systematic process to delineate the job responsibilities typically required of nuclear medicine technologists. The result of this process is a task inventory which is used to develop the clinical competency requirements (see section 4 below) and the content specifications which serve as the foundation for the didactic competency requirements (see section 3 below) and the examination.

2. Documentation of Compliance

After the candidate submits the *Application for Certification and Registration*, the program director (and authorized faculty member if required) will verify that ARRT requirements were met using the Program Verification Form on the ARRT Educator website. The verification includes confirming the applicant has completed the educational program, including the ARRT Didactic and Clinical Competency Requirements and conferment of a degree meeting ARRT requirements. Candidates who complete their educational program during 2027 or 2028 may use either the 2022 *Didactic and Clinical Competency Requirements* or the 2027 requirements. Candidates who complete their educational program after January 31, 2029, must use the 2027 requirements.

3. Didactic Competency Requirements

The purpose of the didactic education requirement is to verify that individuals had the opportunity to develop fundamental knowledge, integrate theory into practice, and hone affective and critical thinking skills required to demonstrate professional competency. Candidates must successfully complete coursework addressing the topics listed in the ARRT Content Specifications for the Nuclear Medicine Technology Examination. These topics would typically be covered in a nationally recognized curriculum such as the SNMMI-TS Curriculum Guide for Educational Programs in Nuclear Medicine Technology. Educational programs accredited by a mechanism acceptable to ARRT generally offer education and experience beyond the minimum requirements specified in the content specifications and clinical competency documents.

4. Clinical Competency Requirements

The purpose of the clinical competency requirements is to document that individuals have demonstrated competence performing the clinical activities fundamental to a particular discipline. Competent performance of these fundamental activities, in conjunction with mastery of the cognitive knowledge and skills as documented by the examination requirement, provides the basis for the acquisition of the full range of procedures typically required in a variety of settings. Demonstration of clinical competence means that the candidate has performed the procedure independently, consistently, and effectively during the course of their formal education. The following pages identify the specific procedures for the clinical competency requirements. Candidates may wish to use these pages, or their equivalent, to record completion of the requirements. The pages do NOT need to be sent to the ARRT.

General Requirement: Remote scanning is not acceptable for completion of ARRT Clinical Requirements. The candidate must complete the examination or procedure at the facility where the patient and equipment are located. The candidate must be physically present during the examination or procedure.

4.1 General Performance Considerations

4.1.1 Patient Diversity

Demonstration of competence should include variations in patient characteristics such as age, gender, and medical condition.

4.1.2 Simulated Performance

ARRT defines simulation of a clinical procedure routinely performed on a patient as the candidate completing all possible hands-on tasks of the procedure on a live human being using the same level of cognitive, psychomotor, and affective skills required for performing the procedure on a patient.

ARRT requires that competencies performed as a simulation must meet the same criteria as competencies demonstrated on patients. For example, the competency must be performed under the direct observation of the program director or program director's designee and be performed independently, consistently, and effectively.

Simulated performance must meet the following criteria:

- Simulation of procedures requires the use of proper equipment such as a gamma camera or processing station.
- A maximum of five diagnostic and therapeutic procedures may be simulated. If applicable, the candidate must evaluate related images and computer processing.

A therapy simulation may include, but not limited to, explaining the indications for a therapy treatment, how a dose is calculated, prepared, and shielded, answering questions about the therapy, and providing patient post therapy instructions. A diagnostic procedure simulation may include, but not limited to, answering questions about the preparation and radiopharmaceutical used, setting up equipment for an acquisition, positioning the patient or volunteer, and reprocessing a previous study if applicable.

4.1.3 Elements of Competence

Demonstration of clinical competence requires that the program director or the program director's designee has observed the candidate performing the procedure independently, consistently, and effectively during the candidate's formal educational program.

Remote scanning is not acceptable for completion of ARRT Clinical Requirements. The candidate must complete the examination or procedure at the facility where the patient and equipment are located. The candidate must be physically present during the examination or procedure.

4.2 Nuclear Medicine Specific Requirements

As part of the education program, candidates must demonstrate competence in the clinical procedures identified below. These clinical activities are listed in more detail in the following sections.

- Nine patient care procedures;
- Six quality control procedures; and
- 26 diagnostic and therapeutic procedures.

4.2.1 General Patient Care

Candidates must be BLS or ACLS certified and demonstrate competence in the remaining eight patient care procedures listed below. The procedures should be performed on patients whenever possible, but simulation is acceptable.

General Patient Care Procedures	Date Completed	Competence Verified By
BLS or ACLS Certified		
Vital Signs – Blood Pressure		
Vital Signs – Pulse Rate		
Vital Signs – Respiration Rate		
Vital Signs – Pulse Oximetry		
Venipuncture		
Assisted Patient Transfer (e.g.,* Slider Board, Mechanical Lift, Gait Belt)		
Maintain and Care for Patient Ancillary Equipment (e.g., Pump, Collection Bag, Oxygen Delivery)		
ECG (e.g., Lead Placement and Recognition of Common Dysrhythmias)		

*The abbreviation “e.g.” is used here and in the remainder of this document to indicate examples but is not a complete list of all possibilities.

4.2.2 Quality Control Procedures

Candidates must demonstrate competence in all six quality control activities listed below.

Quality Control Procedures	Date Completed	Competence Verified By
SPECT Gamma Camera (Uniformity, Resolution, and Center of Rotation)		
Dose Calibrator (Constancy and Linearity)		
Well Counter/Uptake Probe (Energy Calibration)		
Survey Meter (Battery Check and Constancy)		
PET Scanner (Daily Quality Assurance)		
CT Scanner (Air Calibration and QC Phantom) May be done on a PET/CT, SPECT/CT, or CT scanner; Candidate does not need to initiate the scan but must position the phantom and review the image		

4.2.3 Diagnostic and Therapeutic Specific Requirements

Candidates must demonstrate competence in 26 different nuclear medicine procedures. Candidates should demonstrate the following skills when performing the procedures:

- verify patient identity;
- evaluate patient requisition and history;
- explain patient instructions;
- ensure proper preparation and care;
- select, secure, administer, and store the radiopharmaceutical;
- configure equipment and position patient;
- practice radiation safety;
- perform image processing and evaluation;
- send study for interpretation.

All procedures that are not simulated must be performed on patients.

The 26 procedures to be performed are selected from the categories (e.g., cardiovascular, endocrine) listed in the table below. Candidates must select 17 of the 26 procedures from the categories as specified in the table. The remaining 9 procedures may be chosen from any category. The table indicates the procedures in each category and specifies the minimum number of procedures that must be performed in each category. One patient may be used for multiple procedures. However, each type of procedure may be used for only one competency. For example, if a patient has a parathyroid scan ordered and the candidate performs a planar and SPECT scan proficiently, it may be counted as two procedures. If only a SPECT scan is done, it may be counted as a parathyroid scan or SPECT scan but not both.

Category*	**# Procedures in Category**	**# That Must Be Performed**	
Cardiovascular	4	2	
Central Nervous System	4	0	
Endocrine/Exocrine	4	2	
Infection	2	0	
Gastrointestinal	7	3	
Genitourinary	2	1	
Lymphatics	3	0	
PET or PET/CT	7	2	
Respiratory	3	2	
Skeletal	3	2	
SPECT or SPECT/CT	8	2	
Therapy	6	1	
Other Planar or Whole Body	2	0	
Subtotal		17	
		+9	electives from any category
Total	55	26	

Example: Assume a candidate demonstrates competence in 3 cardiovascular procedures (myocardial perfusion-stress, myocardial perfusion-rest, and gated blood pool). This means that the candidate has fulfilled the cardiovascular requirement of 2 procedures and has also completed 1 elective.

* Note: The specific nuclear medicine procedures within each category are identified on the following two pages.

4.2.3 Diagnostic and Therapeutic Specific Requirements (continued)

Candidates must demonstrate competence in 26 different nuclear medicine procedures.

Nuclear Medicine Procedures (# of Required Procedures Appears in Parentheses)	Date Completed	Patient or Simulated	Competence Verified By
Cardiovascular (2)			
Amyloid Imaging			
Gated Blood Pool			
Myocardial Perfusion-Rest			
Myocardial Perfusion-Stress			
Central Nervous System (0)			
Cisternography: Routine			
Cisternography: CSF Leak			
Dynamic			
Shunt Patency			
Endocrine/Exocrine (2)			
Parathyroid			
Thyroid Uptake			
Thyroid Scan			
Thyroid Metastatic Survey			
Infection (0)			
WBC Imaging			
Other (e.g., F-18 FDG)			
Gastrointestinal (3)			
Gastroesophageal Reflux			
Gastric Emptying			
GI Bleed			
Hemangioma			
Hepatobiliary			
Liver/Spleen			
Meckel Diverticulum			
Genitourinary (1)			
Renal Cortical			
Renal Function			
Lymphatics (0)			
Lymphoscintigraphy: Breast			
Lymphoscintigraphy: Skin Lesion			
Lymphangiography			

Nuclear Medicine Procedures (# of Required Procedures Appears in Parentheses)	**Date Completed**	**Patient or Simulated**	**Competence Verified By**
PET or PET/CT (2)			
Brain (F-18 FDG)			
Brain (Other)			
Cardiac (Myocardial Perfusion Imaging)			
Cardiac (e.g., Viability, Sarcoidosis)			
Tumor (F-18 FDG)			
Tumor (Prostate)			
Tumor (Other, e.g., Neuroendocrine)			
Respiratory (2)			
Ventilation (Gas or Aerosol)			
Perfusion			
Quantitative			
Skeletal (2)			
Limited Static			
Three-Phase			
Whole Body			
SPECT or SPECT/CT (2)			
Bone			
Brain			
Liver			
Lung			
Parathyroid			
Renal			
Tumor (e.g., Adrenal, Neuroendocrine)			
Hepatic Artery Perfusion Study (HAPS)			
Therapy (1)			
Thyroid: Ablation			
Thyroid: Hyperthyroidism			
Palliative Bone (e.g., Ra-233 Xofigo)			
Prostate (e.g., Lu-177 Pluvicto)			
Other (e.g., Neuroendocrine)			
Selective Internal Radiation Therapy (SIRT)			
Other Planar or Whole Body (0)			
Tumor (e.g., Adrenal, Neuroendocrine)			
Hepatic Artery Perfusion Study (HAPS)			