Nuclear Medicine Technology

1. Introduction

Candidates applying for certification and registration are required 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.

The requirements are periodically updated based upon 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

To document that the *Didactic and Clinical Competency Requirements* have been satisfied by a candidate, the program director (and authorized faculty member if required) must sign the ENDORSEMENT SECTION of the *Application for Certification and Registration* included in the ~~*Certification and Registration*~~ *Primary Eligibility Pathway Handbook*.

Candidates who complete their educational program during ~~2017~~2022 or ~~2018~~2023 may use either the ~~2014~~ 2017 Didactic and Clinical Competency Requirements or the 2022~~17~~ requirements. Candidates who complete their educational program after December 31, 2023~~18~~ must use the 2022~~17~~ requirements.

3. Didactic Competency Requirements

The purpose of the didactic competency requirements 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 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 ~~here~~ in the content specifications and clinical competency documents.

4. Clinical Competency Requirements

The purpose of the clinical competency requirements is to verify that individuals certified and registered by the ARRT have demonstrated competency 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 covered by the nuclear medicine technology examination, 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~~ candidates ~~has~~ have performed the procedures independently, consistently, and effectively during the course ~~of his or her~~ 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.

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

The ARRT requirements specify that certain clinical procedures may be simulated as designated in the specific requirements below. Simulations must meet the following criteria:

- The candidate must simulate the procedure on another person with the same level of cognitive, psychomotor, and affective skills required for performing the procedure on ~~a~~ patients. Examples of acceptable patient care simulations may include demonstrating CPR on a mannequin, and performing venipuncture by demonstrating aseptic technique on another person, but then inserting the needle into an artificial forearm or suitable device.~~;~~ A therapy simulation may include explaining the indications for a therapy treatment and how a dose is calculated, answering questions about the therapy, and providing post therapy instructions. A procedure simulation may include explaining the procedure, setting up equipment for an acquisition, and reprocessing a previous study if applicable.
- The program director must be confident that the skills required to competently perform the simulated task will generalize or transfer to the clinical setting.~~, and, if applicable, the candidate must evaluate related images.~~

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 course of the candidate's formal educational program.

4.2 Nuclear Medicine Specific Requirements

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

- Eight~~Six~~ patient care activities;
- Six ~~Five~~ quality control procedures; and
- 25 diagnostic and therapeutic procedures.

4.2.1 General Patient Care

Candidates must be CPR certified and demonstrate competence in the remaining seven ~~five~~ patient care activities listed below. The activities should be performed on patients whenever possible, but simulation is acceptable.

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

4.2.2 Quality Control Procedures

Candidates must demonstrate competence in the six ~~all five~~ quality control activities listed below. Radiochromatography may be simulated.

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 or PET/CT (Reference or Blank Scan)		
Radiochromatography (TLC)		

4.2.3 Diagnostic and Therapeutic Specific Requirements

Candidates must demonstrate competence in 25 different nuclear medicine procedures. Candidates should demonstrate the following skills when performing the procedures:

- Verify ~~P~~patient identity~~identify verification~~;
- Evaluate~~ion of~~ patient requisition and history;

- Explain ~~P~~patient instructions;
- Ensure proper ~~P~~preparation and care;
- Select~~ion~~, secure~~handling~~, ~~and administration~~administer, and store the ~~of~~ radiopharmaceutical;
- Configure~~E~~ equipment ~~configuration~~ and position patient ~~positioning~~;
- Practice ~~R~~radiation safety~~; and~~
- Perform ~~I~~image processing and evaluation;
- Send study for interpretation.

Up to four procedures may be simulated. All other procedures must be performed on patients.~~,~~ ~~with the exception of therapeutic procedures which may be simulated.~~

4.2.3 Diagnostic and Therapeutic Specific Requirements (continued)

The 25 procedures to be performed are selected from the categories (cardiovascular, endocrine, etc.) listed in the table below. ~~One mandatory procedure, tumor PET or PET/CT, is required.~~ Candidates must select ~~an additional 16~~ 16 of the ~~24~~ 25 procedures from the categories as specified in the table. The remaining ~~9~~8 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 2 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 ~~(Elective)~~	5~~6~~	0
Endocrine/Exocrine	4	2
~~Abscess and~~ Infection ~~(Elective)~~	2	0
Gastrointestinal	7~~8~~	3
Genitourinary	2~~3~~	1
Lymphatics	3	0
PET or PET/CT	4~~1~~	1
Respiratory	3	2
Skeletal	3	2
SPECT or SPECT/CT	7~~6~~	2
Therapeutic Procedures	5~~4~~	1
Tumor	3	0~~1~~
Subtotal		16~~17~~
		+~~9~~8 electives from any category
Total	52~~47~~	25

Example: Assume a candidate demonstrates competence in 3 cardiovascular procedures (myocardial perfusion-stress, myocardial perfusion-rest, and gated blood pool~~, and PET or PET/CT~~). 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 25 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~~Study~~			
Myocardial Perfusion-Rest			
Myocardial Perfusion-Stress			
Central Nervous System (0~~ – Procedures are Elective~~)			
Cisternography: Routine			
Cisternography: CSF Leak			
Dynamic			
Planar			
~~PET or PET/CT~~			
Shunt Patency			
Endocrine/Exocrine (2)			
Parathyroid			
Thyroid Uptake			
Thyroid Scan			
Thyroid Metastatic Survey			
~~Abscess and~~ Infection (0~~ – Procedures are Elective~~)			
WBC Imaging			
Other (e.g., ~~Gallium~~Ga-67 citrate, F-18 FDG)			
Gastrointestinal (3)			
Gastroesophageal Reflux			
Gastric Emptying			
GI Bleeding			
Hemangioma			
Hepatobiliary			
Liver/Spleen			
Meckel Diverticulum			
~~Damaged RBC Spleen~~			
Genitourinary (1)			
~~Radionuclide Cystogram~~			
Renal Cortical			
Renal Function			
Lymphatics (0)			
Lymphoscintigraphy: Breast			

Lymphoscintigraphy: Skin Lesion			
Lymphangiography: Extremity			
PET or PET/CT (1)			
Brain			
Cardiac			
Tumor (F-18 FDG)			
Tumor (Other)			
Respiratory (2)			
Ventilation (Gas or Aerosol)			
Perfusion			
Quantitative			
Skeletal (2)			
Planar/Static			
Three-Phase			
Total/Whole Body			
~~PET or PET/CT~~			
SPECT or SPECT/CT (2)			
~~Cardiac~~			
Bone			
Brain			
Liver			
Lung			
Parathyroid			
Renal			
Tumor			

4.2.3 Diagnostic and Therapeutic Specific Requirements (continued)

Nuclear Medicine Procedures (# of Required Procedures Appears in Parentheses)	**Date Completed**	**Patient or Simulated**	**Competence Verified By**
Therapeutic Procedures (1) ~~(All may be Simulated)~~			
Thyroid: Ablation			
Thyroid: Hyperthyroidism			
Palliative Bone			
~~Non-Hodgkin Lymphoma~~			
Other (e.g., Endocrine)			
Selective Internal Radiation Therapy			
Tumor (0~~1~~)			
Adrenal			
~~Gallium~~			
~~Lymphoscintigraphy~~			
Neuroendocrine			
Other (e.g., Ga-67 citrate~~gallium neuroendocrine, adrenal~~)			

Moved to Lymphatics