



# Nuclear Medicine Technology

Certification and registration requirements for nuclear medicine technology are based on the results of a comprehensive practice analysis conducted by the American Registry of Radiologic Technologists (ARRT) staff and the Nuclear Medicine Technology Practice Analysis Committee. The [practice analysis](#) identifies job responsibilities typically required of nuclear medicine technologists at entry into the profession. This document reflects the results of the practice analysis. The attached task inventory is the foundation for the [Clinical Requirements](#) and the content outline that, in turn, is the foundation for the [Content Specifications](#) and the Continuing Qualifications Requirements (CQR) Structured Self-Assessment (SSA) Content Specifications.

## Basis of Task Inventory

In 2024, ARRT surveyed a large, national sample of nuclear medicine technologists to identify their responsibilities. When evaluating survey results, the committee considered tasks that 40% or more of respondents perform to be typically required for practice. They included these tasks on the task inventory and excluded tasks that fewer than 40% of respondents perform. The committee also made exceptions to the 40% threshold, as necessary, to ensure the task inventory would be comprehensive. They included critical, but infrequent tasks, or those that would likely soon rise above the threshold and excluded those that would likely soon fall below it.

## Application to 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.

An activity must appear on the task inventory to be considered for inclusion in the clinical requirements. For an activity to be designated as a mandatory requirement, survey results had to indicate that nuclear medicine technologists performed that activity. The committee designated clinical activities that fewer nuclear medicine technologists perform, or that they perform only in selective settings, as elective. The *Nuclear Medicine Technology* [Clinical Requirements](#) are on ARRT's website.

## Application to Content Specifications

The purpose of the examination requirement is to assess whether individuals have obtained the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required in the discipline for practice at entry level. The content specifications identify the knowledge areas underlying performance of the tasks on the task inventory. Every content category can be linked to one or more activities on the task inventory. Note that each activity on the task inventory is followed by a content category that identifies the section of the content specifications corresponding to that activity. The *Nuclear Medicine Technology* [Content Specifications](#) are on ARRT's website.



<b>Activity</b>		<b>Content Categories</b> PC = Patient Care S = Safety IP = Image Production P = Procedures
1.	Schedule patients, taking into consideration the length of the procedure, the patient's condition and age, and preparation for the procedure.	<b>PC:1.G</b>
2.	Sequence imaging procedures to avoid affecting subsequent procedures.	<b>PC:1.G</b>
3.	Review the procedure request to verify information is accurate, appropriate, and complete (e.g., patient history, clinical diagnosis, physician's order).	<b>PC:1.A</b>
4.	Verify procedure coding (e.g., CPT code).	<b>PC:1.A</b>
5.	Demonstrate and promote professional and ethical behavior (e.g., confidentiality, regulation compliance).	<b>PC:1.A</b>
6.	Verify the patient's identity.	<b>PC:1.A</b>
7.	Provide for the patient's safety, comfort, and modesty.	<b>PC:1.C</b>
8.	Manage interpersonal interactions in an effective manner.	<b>PC:1.B</b>
9.	Evaluate the patient's ability to understand and comply with requirements for the requested procedure (e.g., need for medical interpreter, physical, sensory, or cognitive impairments).	<b>PC:1.B</b>
10.	Obtain pertinent medical history.	<b>PC:1.B</b>
11.	Verify informed consent is obtained as necessary.	<b>PC:1.A</b>
12.	Recognize normal, abnormal, and missing lab values (e.g., TSH, bilirubin, $\beta$ -hCG, glucose) relative to the procedure ordered.	<b>PC:1.G</b>
13.	Explain and confirm the patient's preparations (e.g., diet restrictions, preparatory medications) prior to the procedure.	<b>PC:1.B</b>
14.	Explain the procedure to patient, patient's family, or authorized representative (e.g., preprocedure, postprocedure).	<b>PC:1.B</b>
15.	Respond as appropriate to procedure inquiries (e.g., scheduling delays, exam duration, other imaging modalities) from the patient, the patient's family, or authorized representative.	<b>PC:1.B</b>
16.	Use positioning aids, as needed, to reduce patient movement and/or promote patient comfort and/or safety.	<b>PC:1.A</b>
17.	Observe patient during imaging to detect motion.	<b>PC:1.B</b>
18.	Observe patient for adverse reactions to radiopharmaceutical or adjunctive medications.	<b>PC:1.G</b>
19.	Document required information (e.g., imaging procedure, images, adverse events) on patient's medical record.	<b>PC:1.G</b>
20.	Communicate relevant information to appropriate members of the care team.	<b>PC:1.D</b>
21.	Use proper body mechanics and/or ergonomic devices when performing procedures to prevent work-related musculoskeletal disorders.	<b>PC:1.C</b>
22.	Notify appropriate personnel of adverse events or incidents (e.g., patient fall, wrong patient injected).	<b>PC:1.C, PC:1.D</b>



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23.	Obtain vital signs when appropriate (e.g., pulse rate, blood pressure, respiration rate, temperature, pulse oximetry).	
	a. pulse	<b>PC:1.C</b>
	b. blood pressure	<b>PC:1.C</b>
	c. respiration rate	<b>PC:1.C</b>
	d. temperature	<b>PC:1.C</b>
	e. pulse oximetry	<b>PC:1.C</b>
24.	Monitor the patient's auxiliary medical equipment (e.g., IVs, supplemental oxygen).	<b>PC:1.C</b>
25.	Recognize and communicate the need for prompt medical attention.	<b>PC:1.D</b>
26.	Recognize the need for and administer emergency care.	<b>PC:1.D</b>
27.	Practice Standard Precautions.	<b>PC:1.E</b>
28.	Use sterile or aseptic techniques when indicated.	<b>PC:1.E</b>
29.	Clean, disinfect, or sterilize facilities and equipment.	<b>PC:1.E</b>
30.	Follow appropriate transmission-based precautions.	<b>PC:1.E</b>
31.	Follow environmental protection standards for handling and disposing of hazardous materials (e.g., disinfectants).	<b>PC:1.F</b>
32.	Follow environmental protection standards for handling and disposing of biohazardous materials (e.g., sharps, blood, body fluids).	<b>PC:1.E</b>
33.	Advocate for radiation safety and protection.	<b>S:1.A, S:1.B</b>
34.	Take appropriate precautions to minimize occupational radiation exposure (ALARA).	<b>S:1.C</b>
35.	Wear personnel radiation monitoring devices appropriately while on duty.	<b>S:1.C</b>
36.	Evaluate individual occupational exposure reports to determine if values for the reporting period are within established limits.	<b>S:1.D</b>
37.	Take appropriate precautions (e.g., Image Wisely®, Image Gently®) to minimize radiation exposure to the patient.	<b>S:1.C</b>
38.	Screen patients of childbearing age for the possibility of pregnancy and take appropriate action.	<b>S:1.D</b>
39.	Screen patients of childbearing age to determine if the patient is breastfeeding and take appropriate action.	<b>S:1.D</b>
40.	Deface radioactive labels and survey all containers that no longer contain radioactive materials.	<b>S:1.G</b>
41.	Identify a medical event according to regulations (e.g., NRC, state).	<b>S:1.E</b>
42.	Perform radiation surveys and wipe tests in indicated areas and record as prescribed by regulations (e.g., NRC, state).	<b>S:1.F</b>
43.	Ensure that appropriate signs are posted in radiation areas.	<b>S:1.F</b>
44.	Manage radioactive spills to reduce risk of contamination.	<b>S:1.F</b>
45.	Store and/or dispose of radioactive waste according to regulations.	<b>S:1.G</b>



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46.	Store and/or dispose of pharmaceutical waste according to regulations.	<b>S:1.H</b>
47.	Perform required procedures for receipt and return of radioactive materials.	<b>S:1.G</b>
48.	Recognize and report equipment malfunctions:	
	a. patient care equipment (e.g., blood pressure device, EKG monitor, medication pump, oxygen delivery system)	<b>PC:1.C</b>
	b. nuclear medicine equipment	<b>IP:1</b>
49.	Interpret results of instrumentation quality control tests to ensure that performance standards are met.	<b>IP:1</b>
50.	Record and maintain results of instrumentation quality control tests to comply with regulations.	<b>IP:1</b>
51.	Initiate corrective action for deficiencies demonstrated on instrumentation quality control tests.	<b>IP:1</b>
52.	Perform a constancy test on a survey meter with a check source.	<b>IP:1.A</b>
53.	Verify activity to be administered using a dose calibrator.	<b>IP:1.B</b>
54.	Perform an accuracy test on a dose calibrator.	<b>IP:1.B</b>
55.	Perform a constancy test on a dose calibrator.	<b>IP:1.B</b>
56.	Perform a linearity test on a dose calibrator.	<b>IP:1.B</b>
57.	Perform a geometry test on a dose calibrator.	<b>IP:1.B</b>
58.	Perform quality control on the following scintillation detection systems:	
	a. well counter	<b>IP:1.C</b>
	b. uptake probe	<b>IP:1.C</b>
59.	Calibrate scintillation well counter to appropriate photopeak using a radioactive source.	<b>IP:1.C</b>
60.	Determine the efficiency of the scintillation well counter to calculate the disintegrations per minute.	<b>IP:1.C</b>
61.	Calibrate uptake probe to the appropriate photopeak using a radioactive source.	<b>IP:1.C</b>
62.	Prepare a radioactive aerosol system in accordance with regulations.	<b>IP:1.D</b>
63.	Prepare a radioactive gas delivery system in accordance with regulations.	<b>IP:1.D</b>
64.	Operate a gamma camera to obtain high quality images.	<b>IP:1.E</b>
65.	Perform spatial linearity and resolution tests on a gamma camera using a radioactive source and an appropriate phantom.	<b>IP:1.E</b>
66.	Peak gamma camera to appropriate photopeak using a radioactive point or sheet source.	<b>IP:1.E</b>
67.	Use radioactive sources/phantoms for gamma camera quality control using radiation safety precautions.	<b>IP:1.E</b>
68.	Perform uniformity test on a gamma camera using a radioactive source.	<b>IP:1.E</b>



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69.	Perform high count uniformity correction on a gamma camera according to manufacturer's guidelines.	<b>IP:1.E</b>
70.	Perform center of rotation test on a SPECT system.	<b>IP:1.E</b>
71.	Perform tomographic resolution/uniformity test using an appropriate SPECT phantom.	<b>IP:1.E</b>
72.	Operate a PET or PET/CT scanner to obtain high quality images.	<b>IP:1.F</b>
73.	Perform PET scanner quality control.	<b>IP:1.F</b>
74.	Perform CT scanner quality control.	<b>IP:1.F</b>
75.	Process images.	<b>IP:1.G</b>
76.	Perform image fusion/registration from two separate modalities (e.g., PET and CT) using software.	<b>IP:1.G</b>
77.	Operate electronic imaging and record keeping systems (e.g., PACS, EHR, EMR).	<b>IP:1.H</b>
78.	Inspect inventory of radiopharmaceuticals, pharmaceuticals, and supplies to ensure that adequate quantities are available to complete scheduled procedures.	<b>P:1.A</b>
79.	Record patient and radiopharmaceutical information to comply with regulations.	<b>P:1.C</b>
80.	Order appropriate unit doses from radiopharmacy.	<b>P:1.C</b>
81.	Prepare and store radiopharmaceutical/pharmaceutical as directed in the kit instructions provided by the manufacturer or according to department protocol.	<b>P:1.C</b>
82.	Check all radiopharmaceutical/pharmaceutical kits and doses for color and clarity.	<b>P:1.C</b>
83.	Determine the radiopharmaceutical required to perform the study.	<b>P:1.B</b>
84.	Verify that the radiopharmaceutical is correct for the procedure to be performed.	<b>P:1.B</b>
85.	Determine the appropriate radiopharmaceutical/pharmaceutical dosage to be administered.	<b>P:1.C</b>
86.	Determine the appropriate radiopharmaceutical/pharmaceutical dosage for special cases (e.g., pediatric, bariatric, pregnant).	<b>P:1.C</b>
87.	Withdraw the appropriate volume of radiopharmaceutical using aseptic technique and radiation safety precautions.	<b>P:1.C</b>
88.	Label and record the radiopharmaceutical/pharmaceutical, indicating date, type, activity, and other data as required by regulations.	<b>P:1.C</b>
89.	Prior to administration of a pharmaceutical, review pertinent information to prepare the appropriate type and dosage.	<b>P:1.C</b>
90.	Prior to the administration of a pharmaceutical, determine if the patient is at risk for an adverse event.	<b>P:1.C</b>
91.	Perform venipuncture.	<b>P:1.C</b>
92.	Administer intravenous injection of the radiopharmaceutical.	<b>P:1.C</b>



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93.	Administer oral dose of the radiopharmaceutical.	<b>P:1.C</b>
94.	Administer or assist in the administration of interventional pharmaceuticals (e.g., Lugol solution, Regadenoson, morphine sulfate).	<b>P:2, P:3, P:4</b>
95.	Evaluate patient images for technical quality.	<b>P:2, P:3, P:4, P:5</b>
96.	Annotate images with information necessary for identification and interpretation.	<b>P:2, P:3, P:4, P:5</b>
97.	Determine correct placement of electrocardiographic (ECG) leads.	<b>P:2.A, P:2.B</b>
<b>Set up equipment and position patient to obtain the following diagnostic procedures:</b>		
98.	Infection and inflammation	<b>P:5.A</b>
	<b>Bone</b>	
99.	Planar/whole body	<b>P:5.B</b>
100.	3-Phase	<b>P:5.B</b>
101.	SPECT or SPECT/CT	<b>P:5.B</b>
	<b>Brain</b>	
102.	Brain death	<b>P:5.C</b>
103.	SPECT or SPECT/CT	<b>P:5.C</b>
104.	PET or PET/CT	<b>P:5.C</b>
105.	CSF cisternogram / CSF leak	<b>P:5.C</b>
106.	Shunt patency (head)	<b>P:5.C</b>
	<b>Cardiac</b>	
107.	Gated Blood Pool	<b>P:2.A</b>
108.	Myocardial perfusion	
	a. SPECT or SPECT/CT	<b>P:2.B</b>
	b. PET or PET/CT	<b>P:2.B</b>
109.	Myocardial viability	<b>P:2.C</b>
110.	Amyloid imaging	<b>P:2.D</b>
	<b>Gastrointestinal</b>	
111.	Gastric emptying	<b>P:4.A</b>
112.	Gastroesophageal reflux	<b>P:4.B</b>
113.	Meckel diverticulum	<b>P:4.C</b>
114.	GI bleed	<b>P:4.D</b>
	<b>Genitourinary</b>	
115.	Renal function without pharmacological intervention	<b>P:4.H</b>
116.	Renal function with pharmacological intervention (e.g., diuretic)	<b>P:4.H</b>
117.	Renal morphology	<b>P:4.I</b>
118.	Renal SPECT or SPECT/CT	<b>P:4.I</b>



<b>Activity</b>		<b>Content Categories</b> PC = Patient Care S = Safety IP = Image Production P = Procedures
	<b>Liver</b>	
119.	Hepatobiliary function	<b>P:4.E</b>
120.	RBC hemangioma	<b>P:4.F</b>
121.	Liver/spleen	<b>P:4.G</b>
	<b>Lung</b>	
122.	Ventilation – gas	<b>P:5.D</b>
123.	Ventilation – aerosol	<b>P:5.D</b>
124.	Perfusion	<b>P:5.D</b>
125.	Quantitative perfusion	<b>P:5.D</b>
126.	Hepatic artery perfusion study (HAPS) for pretherapy lung shunt fraction	<b>P:5.D</b>
	<b>Lymphoscintigraphy</b>	
127.	Sentinel Node	
	a. breast	<b>P:5.E</b>
	b. skin lesion (e.g., melanoma)	<b>P:5.E</b>
128.	Lymphangiography (extremity)	<b>P:5.E</b>
	<b>Endocrine</b>	
129.	Thyroid uptake	<b>P:3.A</b>
130.	Thyroid imaging	<b>P:3.A</b>
131.	Parathyroid (planar)	<b>P:3.A</b>
132.	Parathyroid SPECT or SPECT/CT	<b>P:3.A</b>
	<b>Tumor</b>	
133.	Planar/whole body	<b>P:3.B</b>
134.	SPECT or SPECT/CT	<b>P:3.B</b>
135.	PET or PET/CT	<b>P:3.B</b>
<b>Perform the following:</b>		
136.	CT for attenuation correction/anatomic correlation with SPECT	<b>P:2, P:3, P:4, P:5</b>
137.	CT for attenuation correction/anatomic correlation with PET	<b>P:2, P:3, P:5</b>
<b>Administer or assist with the administration of the following therapeutic procedures:</b>		
138.	Bone therapy	<b>P:3.C</b>
139.	Thyroid therapy for ablation	<b>P:3.C</b>
140.	Thyroid therapy for hyperthyroidism	<b>P:3.C</b>
141.	Selective internal radiation therapy (SIRT)	<b>P:3.C</b>
142.	Neuroendocrine radiotherapy (e.g., Lu-177 dotatate)	<b>P:3.C</b>
143.	Prostate therapy	<b>P:3.C</b>