

These training requirements apply to those who begin training on or after July 1, 2024.

The following training experiences are required, recommended, or optional as indicated:

TRANSITION TO DISCIPLINE (TTD)

This stage focuses on introducing residents to the specialty of Nuclear Medicine, providing a comprehensive orientation to the setting in which they will work and the goals of the educational program. Residents will apply the knowledge and skills achieved in medical school to gather a clinical history and ascertain the clinical question posed in a request for medical imaging. They will learn to use the equipment and technology of the nuclear medicine service to retrieve and manipulate images, access clinical information, and produce an imaging report.

Required training experiences (TTD stage):

1. Clinical training experiences:
 - 1.1. Any nuclear medicine service
2. Other training experiences:
 - 2.1. Orientation to the nuclear medicine department and hospital, including workstations, imaging system, information technology system, dictation system, and radiopharmacy
 - 2.2. Orientation to the program and university, including policies, resident resources, program portfolios, learning resources, and assessment system
 - 2.3. Orientation to workplace safety, including radiation safety and personal protection
 - 2.4. Verification of or certification in Advanced Cardiac Life Support (ACLS)

Recommended training experiences (TTD stage):

3. Other training experiences:
 - 3.1. Teaching and/or coaching on developing, implementing, and monitoring an individualized learning plan

FOUNDATIONS OF DISCIPLINE (F)

The focus of this stage is the development of the knowledge and skills required to integrate clinical, laboratory, and imaging information in the evaluation of disease processes. Clinical experiences will focus on assessing patients and working effectively with the clinical team. The resident will learn to provide initial management for patients with a serious or life-threatening problem, preparing residents to manage emergencies that develop in the nuclear medicine department. At this stage, there is a focus on the basic sciences underlying the appropriate and safe use of radiopharmaceuticals in nuclear medicine. The nuclear medicine and diagnostic radiology clinical experiences focus on understanding the contribution of various imaging modalities to the resolution of the clinical question and developing an approach to reviewing cross-sectional imaging and nuclear medicine examinations, identifying normal findings, providing a diagnosis of common findings, and recognizing critical findings that warrant communication with the referring physician. This stage furthers the development of the resident's professional identity as a nuclear medicine physician as they integrate into the interprofessional team and apply knowledge of radiation safety and relevant procedures in the response to radiation safety incidents in the department.

Required training experiences (Foundations stage):

1. Clinical training experiences:
 - 1.1. Broad range of medical and surgical clinical services (see Note), including all of the following:
 - 1.1.1. Internal medicine inpatient clinical teaching unit¹ (CTU)
 - 1.1.2. Surgical inpatient care on any surgery service
 - 1.1.3. Cardiac stress testing laboratory
 - 1.1.4. Clinical experience to achieve competence in initial management of patients with acute chest pain, and cardiac medical emergencies, and the management and investigation of patients with chest pain or arrhythmia²
 - 1.1.5. Pediatric acute care service, inpatients, outpatients, emergency department, or acute care clinics
 - 1.1.6. Outpatient clinics
 - 1.1.7. After-hours coverage for a broad spectrum of inpatients

¹ A clinical teaching unit is a team involving learners at multiple levels, with graded responsibility, under the supervision of the attending medical staff.

² This could be achieved through completion of a clinical cardiology experience (3.1.1.), a cardiac stress laboratory experience (1.1.3), emergency medicine experience (3.1.2), or internal medicine experience (1.1.1.).

- 1.2. Diagnostic Radiology
 - 1.2.1. Body imaging, including plain radiography and with emphasis on computed tomography (CT)
 - 1.2.2. Chest imaging, including plain radiography and with emphasis on CT
- 1.3. Nuclear Medicine, in the breadth of techniques and body systems
 - 1.3.1. Non-imaging studies
 - 1.3.2. Planar imaging
 - 1.3.3. Single photon emission computed tomography (SPECT)/CT
 - 1.3.4. Positron emission tomography (PET)/CT
2. Other training experiences:
 - 2.1. Formal instruction in the academic curriculum of Nuclear Medicine, including basic and clinical sciences
 - 2.2. Formal instruction in the preparation of Nuclear Medicine reports
 - 2.3. Case based discussions, such as rounds and hot seats³
 - 2.4. Journal club, or other critical appraisal activity
 - 2.5. Formal presentations and informal teaching to other learners and health professionals

Recommended training experiences (Foundations stage):

3. Clinical training experiences:
 - 3.1. Other clinical services, clinics, and/or consultation service, including any of the following:
 - 3.1.1. Clinical cardiology inpatient service or consultation service
 - 3.1.2. Emergency medicine
 - 3.1.3. Endocrinology
 - 3.1.4. Hematology
 - 3.1.5. Infectious disease
 - 3.1.6. Medical oncology
 - 3.1.7. Neurosciences, including neurology, neurosurgery, or dementia clinic
 - 3.1.8. Otolaryngology – head and neck surgery
 - 3.1.9. Pathology
 - 3.1.10. Pediatric hematology/oncology

³ A hot seat discussion is a formative oral assessment of imaging interpretation, patient management, and radiation safety scenarios.

- 3.1.11. Radiation oncology
- 3.1.12. Rheumatology
- 3.1.13. Thoracic surgery or respirology
- 3.1.14. Urology or nephrology

4. Other training experiences:

- 4.1. Formative assessments: oral or written exams
- 4.2. Formal instruction in teaching skills

Optional training experiences (Foundations stage):

5. Clinical training experiences:

- 5.1. Diagnostic Radiology
 - 5.1.1. CT neuroimaging
 - 5.1.2. CT of the head and neck
 - 5.1.3. Magnetic resonance imaging (MRI)
- 5.2. Attendance at interdisciplinary rounds (e.g., tumour board)

6. Other training experiences:

- 6.1. Attendance at scientific meetings and conferences

CORE OF DISCIPLINE (C)

In this stage, residents build on the skills and knowledge of the previous stages to protocol, supervise, interpret, and report all nuclear medicine diagnostic examinations, including hybrid imaging and nuclear cardiology examinations. They also apply the therapeutic use of unsealed sources of radiation, assessing patients for suitability for treatment, developing and implementing treatment plans, and providing follow-up, as necessary. Residents apply their nuclear medicine expertise and collaboration skills to participate in interdisciplinary rounds. This stage introduces residents to the nuclear medicine physician's role in the operations of the service, including managing the routine caseload of a nuclear medicine department, supervising and teaching junior learners, managing the response to a radiation safety incident, and identifying possible improvements in health care delivery within the specialty.

Required training experiences (Core stage):

1. Clinical training experiences:

- 1.1. Nuclear Medicine
 - 1.1.1. Reading rooms in the breadth of imaging and non-imaging studies

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- 1.1.2. Cardiac stress testing laboratory
- 1.1.3. Outpatient consultation for and administration of unsealed source nuclear medicine therapy
- 1.1.4. Radiopharmacy
- 1.1.5. Nuclear medicine laboratory, including technical aspects of in vitro procedures and instrumentation
- 1.2. Diagnostic Radiology in the breadth of anatomical sites, with emphasis on cross-sectional imaging (CT and MRI), as relevant to Nuclear Medicine
- 1.3. Participation at interdisciplinary rounds (e.g., tumor board)
2. Other training experiences:
 - 2.1. Formal instruction in the academic curriculum of Nuclear Medicine, including basic and clinical sciences
 - 2.2. Formal instruction in teaching skills
 - 2.3. Formal instruction in conflict management
 - 2.4. Formal instruction in managing radiation safety incidents
 - 2.5. Supervise and teach junior learners
 - 2.6. Case based discussions, such as rounds and hot seats
 - 2.7. Journal club, or other critical appraisal activity
 - 2.8. Participation in quality assurance (QA) and/or quality improvement (QI) projects
 - 2.9. Participation in a committee relevant to the program and/or discipline
 - 2.10. Formative assessments: oral and written exams

Recommended training experiences (Core stage):

3. Clinical training experiences:
 - 3.1. Nuclear Medicine in a community hospital setting
 - 3.2. After-hours coverage of the nuclear medicine service
4. Other training experiences:
 - 4.1. Onsite experience with cyclotron
 - 4.2. Participation in a research project
 - 4.3. Review courses relevant to Nuclear Medicine
 - 4.4. Participation in quality assurance rounds
 - 4.5. Formal instruction in stress management and wellness
 - 4.6. Simulation training in ACLS

- 4.7. Simulation training in radiation safety (e.g., radioactive spills)
- 4.8. Participation in an internal inspection with the radiation safety officer
- 4.9. Presentation or attendance at scientific meetings and conferences

Optional training experiences (Core stage):

- 5. Clinical training experiences:
 - 5.1. Nuclear Medicine in the following settings:
 - 5.1.1. Pediatric dedicated hospital and/or facility
 - 5.1.2. Cardiology dedicated hospital and/or facility
 - 5.1.3. Neurology dedicated hospital and/or facility
 - 5.1.4. Emerging modalities facility
 - 5.1.5. Inpatient ward
 - 5.2. Nuclear Medicine experience at a hospital and/or institution setting outside the home university
- 6. Other training experiences:
 - 6.1. Attendance at research ethics committee

TRANSITION TO PRACTICE (TTP)

The focus of this stage is medical leadership of the overall delivery of nuclear medicine diagnostic examinations, maintaining the volume and quality of work and, as needed, addressing department level and/or organizational problems in care delivery, such as equipment malfunction, radiopharmaceutical shortfall, or complex caseloads. At this stage, the resident demonstrates autonomy with the full range of diagnostic and therapeutic applications of nuclear medicine expertise and has an approach to complex cases and controversies in the discipline. The resident contributes this expertise at interdisciplinary rounds and supports clinical colleagues in the development of management plans. This stage also focuses on preparation for independent practice, with formal instruction and experience in areas of administrative and professional responsibility, including leadership of the nuclear medicine service delivery.

Required training experiences (TTP stage):

- 1. Clinical training experiences:
 - 1.1. Nuclear Medicine in the breadth of elective and urgent diagnostic and therapeutic services in the role of junior attending⁴

⁴ Junior attending means that the resident assumes responsibility for patient care and leadership in the education and clinical supervision of junior colleagues, with as much independence as permitted by ability, law, and hospital policy.

- 1.2. Participation at interdisciplinary rounds e.g., tumor board
2. Other training experiences:
 - 2.1. Formal instruction in
 - 2.1.1. Practice management
 - 2.1.2. Leadership of nuclear medicine programs
 - 2.2. Journal club, or other critical appraisal activity
 - 2.3. Providing formal teaching sessions

Recommended training experiences (TTP stage):

3. Clinical training experiences:
 - 3.1. After-hours coverage for a nuclear medicine service
 - 3.2. Focused nuclear medicine training in an area of interest
4. Other training experiences:
 - 4.1. Simulation learning experiences in equipment assessment and/or purchase
 - 4.2. Teaching others about Nuclear Medicine
 - 4.2.1. Technologists
 - 4.2.2. Departmental or hospital grand rounds
 - 4.2.3. Other services or departments
 - 4.3. Teaching or coaching regarding plans for continuing professional development

CERTIFICATION REQUIREMENTS

Royal College certification in Nuclear Medicine requires all of the following:

1. Successful completion of the Royal College examination in Nuclear Medicine; and
2. Successful completion of the Royal College Nuclear Medicine Portfolio.

NOTES

The Nuclear Medicine Portfolio refers to the list of entrustable professional activities across all four stages of the residency Competence Continuum and associated national standards for assessment and achievement.

1. Item 1.1 of the Foundations stage of Required Training Experiences in Nuclear Medicine is intended to provide sufficient experience with patients with a broad range of presentations and conditions, including those related to the cardiac system and thyroid disorders, as well as patients with cancer and infectious disease.
2. Item 1.1 of the Core stage of Required Training Experiences in Nuclear Medicine is intended to provide broad exposure to diagnostic and therapeutic use of open source radioactive materials and related technologies as applied at all ages and all body systems. This includes imaging and non-imaging studies as applied to bone mineral densitometry, tumor imaging, and investigations of the cardiac, endocrine, gastrointestinal, hepatobiliary, lymphatic, musculoskeletal, neurologic, pulmonary, and renal and genitourinary systems. Therapeutic applications include thyrotoxicosis, thyroid cancer, bone metastases, and targeted cancer therapy.

MODEL DURATION OF TRAINING

Progress in training occurs through demonstration of competence and advancement through the stages of the Competence Continuum. There is no mandated period of training; historically, training in Nuclear Medicine has required five years. Individual duration of training may be influenced by many factors, which may include the resident's singular progression through the stages, the availability of teaching and learning resources, and/or differences in program implementation. Duration of training for any one individual is therefore at the discretion of the Faculty of Medicine, the Competence Committee, and the program director.

Guidance for programs

The Royal College Specialty Committee in Nuclear Medicine suggested course of training, for the purposes of planning learning experiences and schedules, is as follows:

- One to two blocks in Transition to Discipline
- 19-26 blocks in Foundations
- 32-39 blocks in Core
- Four to six blocks in Transition to Practice

Guidance for postgraduate medical education offices

For planning purposes, the stages of the Competence Continuum in Nuclear Medicine are generally no longer than:

- Two blocks for Transition to Discipline
- 26 blocks for Foundations of Discipline
- 39 blocks for Core of Discipline
- Six blocks for Transition to Practice
- Total duration of training – 73 blocks

**One block is equal to four weeks*

Certification in Nuclear Medicine in association with Diagnostic Radiology may be achieved with approval of both program directors; historically this has required a minimum of six years of which at least two years were focused in Nuclear Medicine.

Alternate routes of entry

Individuals who are eligible for, or have achieved, certification in Diagnostic Radiology may be eligible for an accelerated course of training leading to certification in Nuclear Medicine, based on the achievement of competencies relevant to Nuclear Medicine in Diagnostic Radiology. The Specialty Committee in Nuclear Medicine has identified that the entrustable professional activities of Nuclear Medicine at the Foundations and Core stage related to the interpretation of CT imaging studies will have been achieved in Diagnostic Radiology training. In addition, the achievement of the competencies (expressed as EPAs and milestones) of Diagnostic Radiology will typically facilitate and accelerate the acquisition of some of the competencies of Nuclear Medicine. Decisions regarding the achievement of relevant competencies will be made on an individual basis by the accepting Nuclear Medicine program and its postgraduate medical education office, following the principles of the Royal College Credentials policy.

Guidance for residents and programs regarding accelerated training for residents in training or graduates of Diagnostic Radiology

1. It is strongly recommended that early in their Diagnostic Radiology training, individuals who intend to pursue training in Nuclear Medicine contact the program directors of both the Diagnostic Radiology and Nuclear Medicine programs to declare their intention and discuss how to tailor their training.
2. Relevant entrustable professional activities and training experiences during Diagnostic Radiology will be reviewed on an individual basis by the accepting Nuclear Medicine program and its postgraduate medical education office and can be credited towards achievement of competence in Nuclear Medicine.

NUCLEAR MEDICINE TRAINING EXPERIENCES (2024)

3. Transition to Discipline in the Nuclear Medicine program can be used to verify and document achievement of Foundations and selected Core Nuclear Medicine EPAs and to create an individualized curriculum.

This document is to be reviewed by the Specialty Committee in Nuclear Medicine by December 2026.

APPROVED – Specialty Standards Review Committee – March 2019

APPROVED – Specialty Standards Review Committee – September 2023