Advanced Specialty Program Requirements for Graduate Medical Education in Diagnostic Radiology

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ACGME International Advanced Specialty Program Requirements for Graduate Medical Education in Diagnostic Radiology

I. Introduction

I.A. Definition and Scope of the Specialty

The hospital-based ancillary specialty of diagnostic radiology encompasses a variety of diagnostic and image-guided therapeutic techniques, including all aspects of image-based diagnosis, such as radiography, nuclear radiology, diagnostic ultrasound, magnetic resonance, computed tomography, interventional procedures, and molecular imaging.

I.B. Duration of Education

I.B.1. The education in diagnostic radiology must be 48 or 60 months in length.

I.B.1.a) The program may include an additional 12 months of education in fundamental clinical skills of medicine.

II. Institutions

II.A. Sponsoring Institution

See International Foundational Requirement, Section I.A.

II.B. Participating Sites

II.B.1. The program should be based at the primary clinical site.

II.B.1.a) Each participating site must offer significant educational opportunities to the residents.

II.B.1.b) Programs should avoid affiliations with sites at such distances from the primary clinical site as to make resident attendance at rounds and conferences impractical.

III. Program Personnel and Resources

III.A. Program Director

III.A.1. If the program uses multiple sites, the program director must ensure that a unified educational experience occurs for each resident.

III.B. Faculty

III.B.1. There must be at least one full-time equivalent (FTE) physician faculty member in each of the nine subspecialty areas of neuroradiology, musculoskeletal radiology, vascular and interventional radiology,
cardiothoracic radiology, breast radiology, abdominal radiology, pediatric radiology, ultrasonography, and nuclear radiology.

III.B.1.a) This individual must practice at least 50 percent of his or her time in the subspecialty area, and must demonstrate a commitment to the subspecialty. Such commitment may be demonstrated by any one of the following:

III.B.1.a).(1) subspecialty certification, successful completion of a fellowship, or three years of subspecialty practice;

III.B.1.a).(2) membership in a subspecialty society;

III.B.1.a).(3) publications and presentations in the subspecialty; or,

III.B.1.a).(4) annual continuing medical education credits in the subspecialty.

III.B.2. No faculty member should have primary responsibility for the educational content of more than one subspecialty area, although faculty members may have clinical responsibilities and/or teaching responsibilities in several subspecialty areas.

III.B.3. A pediatric radiologist with a primary appointment at another site can still be the designated faculty member supervising pediatric radiologic education.

III.C. Other Program Personnel

III.C.1. There must be a dedicated program coordinator who has sufficient time to fulfill the responsibilities essential in meeting the educational goals and administrative requirements of the program.

III.D. Resources

III.D.1. The program must provide the modern facilities and equipment required in all of the subspecialty rotations.

III.D.2. The program’s volume must be no fewer than 7,000 radiologic examinations per year per resident.

III.D.2.a) The number of examinations in each of the nine subspecialty areas must be of sufficient volume to ensure adequate training experience.

IV. Resident Appointment

IV.A. Eligibility Criteria

IV.A.1. Residents must have successfully completed 12 months of a broad-based clinical program (PGY-1) that is:

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IV.A.1.a) accredited by the ACGME International (ACGME-I), the ACGME, or the Royal College of Physicians and Surgeons of Canada in preliminary general surgery, preliminary internal medicine, or the transitional year; or,

IV.A.1.b) at the discretion of the Review Committee-International, a program where a governmental or regulatory body is responsible for the maintenance of a curriculum providing clinical and didactic experiences to develop competency in the fundamental clinical skills of medicine; or,

IV.A.1.b).(1) A categorical residency that accept candidates from these programs must complete an evaluation of each resident’s fundamental clinical skills within six weeks of matriculation, and must provide remediation to residents as needed.

IV.A.1.c) integrated into the residency where the program director must oversee and ensure the quality of didactic and clinical education.

IV.A.2. The PGY-1 must be completed in a structured program in which residents are educated in high-quality medical care based on scientific knowledge, evidence-based medicine, and sound teaching by qualified educators.

IV.A.3. With appropriate supervision, residents must have first-contact responsibility for evaluation and management for all types and acuity levels of patients.

IV.A.4. Residents must have responsibility for decision-making and direct patient care in all settings, to include the writing of orders, progress notes, and relevant records.

IV.A.5. Residents must develop competency in the following fundamental clinical skills during the PGY-1:

IV.A.5.a) obtaining a comprehensive medical history;

IV.A.5.b) performing a comprehensive physical examination;

IV.A.5.c) assessing a patient’s medical condition;

IV.A.5.d) making appropriate use of diagnostic studies and tests;

IV.A.5.e) integrating information to develop a differential diagnosis; and,

IV.A.5.f) developing, implementing, and evaluating a treatment plan.
IV.B. Number of Residents

IV.B.1. There must be a minimum number of two residents per year of education.

V. Specialty-Specific Educational Program

V.A. RegularlyScheduled Didactic Sessions

V.A.1. If it includes an integrated PGY-1, the educational program must contain regularly scheduled didactic sessions that enhance and correspond to the residents’ fundamental clinical skills education.

V.A.2. The curriculum must include at least 80 hours of didactic (classroom and laboratory training) education, under the direction of an authorized preceptor, that includes:

V.A.2.a) diagnostic radiologic physics, instrumentation, and radiation biology;

V.A.2.b) patient and medical personnel safety (i.e., radiation protection);

V.A.2.c) the chemistry of by-product material for medical use;

V.A.2.d) biologic and pharmacologic actions of materials administered in diagnostic and therapeutic procedures; and,

V.A.2.e) topics in safe handling, administration, and quality control of radionuclide doses used in clinical medicine.

V.A.3. The program must have a minimum of five hours per week of conferences/lectures throughout the year.

V.A.4. Residents’ didactic instruction (or work experience when appropriate) must include:

V.A.4.a) ordering, receiving, and unpacking radioactive material safely, and performing the related radiation surveys;

V.A.4.b) safe elution and quality control (QC) of radionuclide generator systems; calculating, measuring, and safely preparing patient dosages; calibration and QC of survey meters and dose calibrators;

V.A.4.c) safe handling and administration of therapeutic doses of unsealed radionuclide sources (i.e., I-131);

V.A.4.d) written directives;

V.A.4.e) response to radiation spills and accidents (containment and decontamination procedures);
V.A.4.f) radiation signage and related materials; and,
V.A.4.g) using administrative controls to prevent medical events involving the use of unsealed byproduct material.

V.A.5. Didactic instruction must address general content, including:

V.A.5.a) appropriate imaging utilization (e.g., proper sequencing, cost-benefit analysis);
V.A.5.b) radiologic/pathologic correlation; (This requirement may be satisfied by resident participation in a formal course on radiologic- pathologic correlation.)
V.A.5.c) fundamentals of molecular imaging;
V.A.5.d) biologic and pharmacologic actions of materials administered in diagnostic or therapeutic procedures;
V.A.5.e) use of needles, catheters, and other devices employed in invasive image-based diagnostic and therapeutic procedures; and,
V.A.5.f) socioeconomics of radiologic practice.

V.A.6. There must be a didactic component for each of the nine subspecialty areas. The content should include anatomy, physiology, disease processes, and imaging in all age groups.
V.A.6.a) Faculty members from each of the nine designated subspecialty areas must organize a series of intradepartmental lectures that cover these topics in their respective subspecialty area. These lectures may be supplemented with other educational materials.

V.A.7. Residents must have training in the acquisition and interpretation of conventional radiography, computed tomography, magnetic resonance imaging, angiography, and nuclear radiology examinations of the cardiovascular system (heart, coronary arteries, and great vessels).
V.A.7.a) This must include studies performed on both adults and children.

V.A.8. Residents must maintain current basic life-support (BLS) certification.
V.A.8.a) Advanced cardiac life-support (ACLS) certification training is recommended.

V.A.9. Interactive conferences in addition to the core didactic series must occur.
V.A.10. Interdepartmental conferences in which both residents and faculty members participate on a regular basis must occur.

V.B. Clinical Experiences

V.B.1. If the program includes an integrated PGY-1, this experience must include a minimum of 11 months of direct patient care.

V.B.1.a) During the integrated PGY-1 each resident’s experiences must include responsibility for patient care commensurate with his or her ability.

V.B.1.a).(1) Residents must have responsibility for decision-making and direct patient care in all settings, subject to review and approval by senior-level residents and/or attending physicians, to include the planning of care and the writing of orders, progress notes, and relevant records.

V.B.1.b) At a minimum, 28 weeks must be in rotations provided by a discipline or disciplines that offer fundamental clinical skills in the primary specialties, such as emergency medicine, family medicine, general surgery, internal medicine, obstetrics and gynecology, or pediatrics.

V.B.1.b).(1) Subspecialty experiences, with the exception of critical care unit experiences, must not be used to meet fundamental clinical skills curriculum requirements.

V.B.1.b).(2) Each experience must be at minimum a four-week continuous block.

V.B.1.c) At a minimum, residents must have 140 hours of experience in ambulatory care provided in family medicine or primary care internal medicine, general surgery, obstetrics and gynecology, or pediatrics.

V.B.1.d) Residents must have a maximum of 20 weeks of elective experiences.

V.B.1.d).(1) Elective rotations should be determined by the educational needs of the individual resident.

V.B.2. Programs must include clinical experiences in the nine subspecialty areas of neuroradiology, musculoskeletal radiology, vascular and interventional radiology, cardiothoracic radiology, breast radiology, abdominal radiology, pediatric radiology, ultrasonography (including obstetrical and vascular ultrasound), and nuclear radiology (including PET and nuclear cardiology).
V.B.2.a) For programs with 48 months of education in diagnostic radiology, the maximum period of education in any one of the nine subspecialty areas is 16 months.

V.B.2.b) For programs with 60 months of education in diagnostic radiology, the maximum period of education in any one of the nine subspecialty areas is 20 months.

V.B.3. Residents must have education and experience in clinical nuclear medicine.

V.B.3.a) For programs with 48 months of education in diagnostic radiology, residents must have from two to four months of experience in clinical nuclear medicine.

V.B.3.a) For programs with 60 months of education in diagnostic radiology, residents must have from four to five months of experience in clinical nuclear medicine.

V.B.4. Residents must have clinical rotations in breast imaging after completing the first year of their specialty education.

V.B.4.a) Residents should document the interpretation/multi-reading of mammograms.

V.B.5. Residents must document the performance, interpretation, and complications of vascular, interventional, and invasive procedures.

V.B.6. Each resident must participate with preceptors in therapies involving oral administration of I-131 with documentation of the date, diagnosis, and dose.

V.B.7. Residents must have documented supervised experience in interventional procedures, including image-guided biopsies, drainage procedures, angioplasty, embolization and infusion procedures, and other percutaneous interventional procedures, to include the performance, interpretation, and complications of vascular, interventional, and invasive procedures.

V.B.8. Senior residents must have experience supervising or acting as consultants to and teaching medical students and residents.

V.C. Residents’ Scholarly Activities

V.C.1. Residents must engage in a scholarly project under faculty supervision, in the form of laboratory research, clinical research, the analysis of disease processes, imaging techniques, or practice management issues.
V.C.2. The results of such projects must be published or presented at institutional, local, regional, or national meetings.

V.C.3. The program must specify how each project will be evaluated.

V.D. Duty Hour and Work Limitations

V.D.1. Supervision of Residents

V.D.1.a) Faculty supervision must be available at all participating sites, and direct faculty supervision is required for all percutaneous invasive procedures, excluding intravenous injection of contrast.

V.D.1.b) Residents must always have faculty back-up when taking night, weekend, or holiday call.

V.D.1.c) The program must systematically review the radiologic images evaluated only by residents to ensure accuracy by

V.D.1.c).(1) having all residents’ reports signed and reviewed by faculty members within 24 hours; or,

V.D.1.c).(2) routinely sampling residents’ reports for faculty over-read to check their accuracy.

V.D.2. Participation in on-call activities is essential for the development of radiologists who are expected to practice independently upon completion of training and should occur throughout the second, third, and final years of the program.

VI. ACGME-I Competencies

VI.A. Patient Care

Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents must demonstrate proficiency in:

VI.A.1. safe, efficient, appropriately-utilized, quality-controlled diagnostic and/or interventional radiology techniques;

VI.A.2. communicating effectively and in a timely manner the results of procedures, studies, and examinations to the referring physician and/or other appropriate individuals;

VI.A.3. functioning as consultants for other health care professionals, and acting as a resource for information regarding the most appropriate use of imaging resources;
VI.A.4. accessing, interpreting, and applying best scientific evidence to the care of patients (evidence-based medicine); and,

VI.A.5. their awareness of radiation exposure, protection, and safety, as well as the application of these principles in imaging.

VI.B. **Medical Knowledge**

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care. Residents must demonstrate proficiency in their knowledge of:

VI.B.1. diagnostic radiologic physics, instrumentation, and radiation biology;

VI.B.2. patient and medical personnel safety (i.e., radiation protection, magnetic resonance imaging safety);

VI.B.3. the chemistry of byproduct material for medical use;

VI.B.4. biologic and pharmacologic actions of materials administered in diagnostic and therapeutic procedures;

VI.B.5. the safe handling, administration, and quality control of radionuclide doses used;

VI.B.6. appropriate imaging utilization (proper sequencing, cost-benefit analysis);

VI.B.7. radiologic/pathologic correlation;

VI.B.8. fundamentals of molecular imaging;

VI.B.9. use of needles, catheters, and other devices employed in invasive image-based diagnostic and therapeutic procedures; and,

VI.B.10. socioeconomics of radiologic practice.

VI.C. **Practice-based Learning and Improvement**

Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Residents are expected to develop skills and habits to be able to meet the following goals:

VI.C.1. identify strengths, deficiencies, and limits in one’s knowledge and expertise;

VI.C.2. set learning and improvement goals;

VI.C.3. identify and perform appropriate learning activities;
VI.C.4. systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;

VI.C.5. incorporate formative evaluation feedback into daily practice;

VI.C.6. locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems;

VI.C.7. use information technology to optimize learning; and,

VI.C.8. participate in the education of patients, families, students, residents and other health professionals.

VI.D. Interpersonal and Communication Skills

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Residents must:

VI.D.1. communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;

VI.D.2. communicate effectively with physicians, other health professionals, and health-related agencies;

VI.D.3. work effectively as a member or leader of a health care team or other professional group;

VI.D.4. act in a consultative role to other physicians and health professionals; and,

VI.D.5. maintain comprehensive, timely, and legible medical records, if applicable.

VI.E. Professionalism

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents must demonstrate:

VI.E.1. compassion, integrity, and respect for others;

VI.E.2. responsiveness to patient needs that supersedes self-interest;

VI.E.3. respect for patient privacy and autonomy;

VI.E.4. accountability to patients, society and the profession;
VI.E.5. sensitivity and responsiveness to a diverse patient population, including to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation; and,

VI.E.6. ethical and medical jurisprudence.

VI.F. Systems-based Practice

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents must:

VI.F.1. work effectively in various health care delivery settings and systems relevant to their clinical specialty;

VI.F.2. coordinate patient care within the health care system relevant to their clinical specialty;

VI.F.3. incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care, as appropriate;

VI.F.4. advocate for quality patient care and optimal patient care systems;

VI.F.5. work in inter-professional teams to enhance patient safety and improve patient care quality; and,

VI.F.6. participate in identifying system errors and implementing potential systems solutions.