

ACGME Program Requirements for Graduate Medical Education in Diagnostic Radiology

Common Program Requirements are in BOLD

Effective: July 1, 2008

Introduction

Int.A. Definition and Scope of the Specialty

Diagnostic radiology encompasses a variety of diagnostic and image guided therapeutic techniques, including all aspects of image-based diagnosis, (radiography, nuclear radiology, diagnostic ultrasound, magnetic resonance, computed tomography, interventional procedures, and molecular imaging). The residency program in diagnostic radiology shall offer a quality graduate medical educational experience in all of these associated disciplines.

Int.B. Duration and Scope of Education

Int.B.1. Resident education in diagnostic radiology must include five years of clinically oriented graduate medical education, of which four years must be in diagnostic radiology.

Int.B.2. Clinical Year

Int.B.2.a) This year must consist of training accredited by the Accreditation Council for Graduate Medical Education (ACGME), the Royal College of Physicians and Surgeons of Canada (RCPSC), or equivalent organization in internal medicine, pediatrics, surgery or surgical specialties, obstetrics and gynecology, neurology, family medicine, emergency medicine, or any combination of these. The clinical year may also comprise a transitional year accredited by the ACGME or equivalent organization.

Int.B.2.b) If the clinical year is offered by the institution of the core residency, and is not a stand alone ACGME-accredited year, the program director will be responsible for assuring the quality of the year.

Int.B.2.c) The program director is responsible for verifying that the resident accepted into the diagnostic radiology program has successfully completed the clinical year.

Int.B.3. Diagnostic Radiology Residency

The residency program is four years of graduate medical education (including vacation and meeting time) in diagnostic radiology. Full time participation by the residents in clinical and didactic activities must occur at all levels of training, including the final year of residency. In the four years, the maximum period of training in any one of the nine subspecialty areas shall be 12 months. The nine subspecialty areas of diagnostic radiology are 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).

Int.B.4. The education in diagnostic radiology must occur in an environment that encourages the interchange of knowledge and experience among residents in the program and among residents in other major clinical specialties located in those institutions participating in the program.

I. Institutions

I.A. Sponsoring Institution

One sponsoring institution must assume ultimate responsibility for the program, as described in the Institutional Requirements, and this responsibility extends to resident assignments at all participating sites.

The sponsoring institution and the program must ensure that the program director has sufficient protected time and financial support for his or her educational and administrative responsibilities to the program.

I.B. Participating Sites

I.B.1. There must be a program letter of agreement (PLA) between the program and each participating site providing a required assignment. The PLA must be renewed at least every five years.

The PLA should:

I.B.1.a) identify the faculty who will assume both educational and supervisory responsibilities for residents;

I.B.1.b) specify their responsibilities for teaching, supervision, and formal evaluation of residents, as specified later in this document per Sections II.B and V.A;

I.B.1.c) specify the duration and content of the educational experience; and,

I.B.1.d) state the policies and procedures that will govern resident education during the assignment.

I.B.2. The program director must submit any additions or deletions of participating sites routinely providing an educational experience, required for all residents, of one month full time equivalent (FTE) or more through the Accreditation Council for Graduate Medical Education (ACGME) Accreditation Data System (ADS).

I.B.3. The program should be based at a primary hospital. A program using multiple sites must ensure the provision of a unified educational

experience for the residents. Each participating site must offer significant educational opportunities to the overall program. Service responsibility alone at a participating site is not a suitable educational experience.

- I.B.4. Programs should avoid affiliations with sites at such distances from the primary hospital as to make resident attendance at rounds and conferences impractical, unless there is a comparable educational experience at the site.

II. Program Personnel and Resources

II.A. Program Director

II.A.1. There must be a single program director with authority and accountability for the operation of the program. The sponsoring institution's GMEC must approve a change in program director. After approval, the program director must submit this change to the ACGME via the ADS.

II.A.1.a) The program director should be a full-time faculty member.

II.A.1.b) The program director must be provided the equivalent of at least one day a week protected time in order to fulfill the responsibilities inherent in meeting the educational goals of the program.

II.A.2. The program director should continue in his or her position for a length of time adequate to maintain continuity of leadership and program stability.

II.A.3. Qualifications of the program director must include:

II.A.3.a) requisite specialty expertise and documented educational and administrative experience acceptable to the Review Committee;

II.A.3.b) current certification in the specialty by the American Board of Radiology, or specialty qualifications that are judged to be acceptable by the Review Committee; and,

II.A.3.c) current medical licensure and appropriate medical staff appointment.

II.A.4. The program director must administer and maintain an educational environment conducive to educating the residents in each of the ACGME competency areas. The program director must:

II.A.4.a) oversee and ensure the quality of didactic and clinical education in all institutions that participate in the program;

- II.A.4.b)** approve a local director at each participating site who is accountable for resident education;
- II.A.4.c)** approve the selection of program faculty as appropriate;
- II.A.4.d)** evaluate program faculty and approve the continued participation of program faculty based on evaluation;
- II.A.4.e)** monitor resident supervision at all participating sites;
- II.A.4.f)** prepare and submit all information required and requested by the ACGME, including but not limited to the program information forms and annual program resident updates to the ADS, and ensure that the information submitted is accurate and complete;
- II.A.4.g)** provide each resident with documented semiannual evaluation of performance with feedback;
- II.A.4.h)** ensure compliance with grievance and due process procedures as set forth in the Institutional Requirements and implemented by the sponsoring institution;
- II.A.4.i)** provide verification of residency education for all residents, including those who leave the program prior to completion;
- II.A.4.j)** implement policies and procedures consistent with the institutional and program requirements for resident duty hours and the working environment, including moonlighting, and, to that end, must:
 - II.A.4.j).(1)** distribute these policies and procedures to the residents and faculty;
 - II.A.4.j).(2)** monitor resident duty hours, according to sponsoring institutional policies, with a frequency sufficient to ensure compliance with ACGME requirements;
 - II.A.4.j).(3)** adjust schedules as necessary to mitigate excessive service demands and/or fatigue; and,
 - II.A.4.j).(4)** if applicable, monitor the demands of at-home call and adjust schedules as necessary to mitigate excessive service demands and/or fatigue.
- II.A.4.k)** monitor the need for and ensure the provision of back up support systems when patient care responsibilities are unusually difficult or prolonged;

- II.A.4.l)** comply with the sponsoring institution's written policies and procedures, including those specified in the Institutional Requirements, for selection, evaluation and promotion of residents, disciplinary action, and supervision of residents;
- II.A.4.m)** be familiar with and comply with ACGME and Review Committee policies and procedures as outlined in the ACGME Manual of Policies and Procedures;
- II.A.4.n)** obtain review and approval of the sponsoring institution's GMEC/DIO before submitting to the ACGME information or requests for the following:
 - II.A.4.n).(1)** all applications for ACGME accreditation of new programs;
 - II.A.4.n).(2)** changes in resident complement;
 - II.A.4.n).(3)** major changes in program structure or length of training;
 - II.A.4.n).(4)** progress reports requested by the Review Committee;
 - II.A.4.n).(5)** responses to all proposed adverse actions;
 - II.A.4.n).(6)** requests for increases or any change to resident duty hours;
 - II.A.4.n).(7)** voluntary withdrawals of ACGME-accredited programs;
 - II.A.4.n).(8)** requests for appeal of an adverse action;
 - II.A.4.n).(9)** appeal presentations to a Board of Appeal or the ACGME; and,
 - II.A.4.n).(10)** proposals to ACGME for approval of innovative educational approaches.
- II.A.4.o)** obtain DIO review and co-signature on all program information forms, as well as any correspondence or document submitted to the ACGME that addresses:
 - II.A.4.o).(1)** program citations, and/or
 - II.A.4.o).(2)** request for changes in the program that would have significant impact, including financial, on the program or institution.

- II.A.4.p) participate in the ACGME case log system. The logs must be submitted annually to the Review Committee office in accordance with the format and the due date specified by the Review Committee. The record must be reviewed by the program director at least annually;
- II.A.4.q) be responsible for ensuring that the general content is integrated into the conference schedule;
- II.A.4.r) ensure that programs have a minimum of five hours per week of conferences/lectures;
- II.A.4.s) ensure that residents have protected time to attend all scheduled lectures and conferences. Resident attendance at conferences/lectures must be documented;
- II.A.4.t) ensure that there are interactive conferences in addition to the core didactic series; and,
- II.A.4.u) ensure that there are interdepartmental conferences in which both residents and faculty participate on a regular basis.

II.B. Faculty

II.B.1. At each participating site, there must be a sufficient number of faculty with documented qualifications to instruct and supervise all residents at that location.

The faculty must:

II.B.1.a) devote sufficient time to the educational program to fulfill their supervisory and teaching responsibilities; and to demonstrate a strong interest in the education of residents; and,

II.B.1.b) administer and maintain an educational environment conducive to educating residents in each of the ACGME competency areas.

II.B.2. The physician faculty must have current certification in the specialty by the American Board of Radiology, or possess qualifications judged to be acceptable by the Review Committee.

II.B.2.a) In programs affiliated with a medical school, all members of the faculty must have their academic appointment in the department of radiology. For programs not affiliated with a medical school, all physician faculty must be members of the medical staff of at least one of the participating sites.

- II.B.2.b) There must be at least one FTE physician faculty in each of the nine subspecialty areas. The nine subspecialty areas are neuroradiology, musculoskeletal radiology, vascular and interventional radiology, cardiothoracic radiology, breast radiology, abdominal radiology, pediatric radiology, ultrasonography, and nuclear radiology.
- II.B.2.c) The program must designate one physician faculty member to be responsible for the educational content of each of the nine subspecialty areas. This individual must practice at least 50% of his or her time in the subspecialty area, and must demonstrate a commitment to the subspecialty. Such commitment may be demonstrated by any of the following:
- II.B.2.c).(1) subspecialty certification (CAQ), fellowship training or three years of subspecialty practice;
- II.B.2.c).(2) membership in a subspecialty society;
- II.B.2.c).(3) publications and presentations in the subspecialty;
- II.B.2.c).(4) annual CME credits in the subspecialty; or,
- II.B.2.c).(5) participation in maintenance of certification with emphasis on the subspecialty area.
- II.B.2.d) No faculty member may have primary responsibility for the educational content of more than one subspecialty area, although faculty may have clinical responsibility and/or teaching responsibilities in several subspecialty areas. A pediatric radiologist may have a primary appointment at another site and still be the designated faculty member supervising pediatric radiologic education.
- II.B.3. The physician faculty must possess current medical licensure and appropriate medical staff appointment.**
- II.B.4. The nonphysician faculty must have appropriate qualifications in their field and hold appropriate institutional appointments.**
- II.B.5. The faculty must establish and maintain an environment of inquiry and scholarship with an active research component.**
- II.B.5.a) The faculty must regularly participate in organized clinical discussions, rounds, journal clubs, and conferences.**
- II.B.5.b) Some members of the faculty should also demonstrate scholarship by one or more of the following:**
- II.B.5.b).(1) peer-reviewed funding;**

- II.B.5.b).(2) **publication of original research or review articles in peer-reviewed journals, or chapters in textbooks;**
- II.B.5.b).(3) **publication or presentation of case reports or clinical series at local, regional, or national professional and scientific society meetings; or,**
- II.B.5.b).(4) **participation in national committees or educational organizations.**
- II.B.5.c) **Faculty should encourage and support residents in scholarly activities.**

II.C. **Other Program Personnel**

The institution and the program must jointly ensure the availability of all necessary professional, technical, and clerical personnel for the effective administration of the program.

- II.C.1. Programs must have a dedicated radiology residency program coordinator. This person must have sufficient time to fulfill the responsibilities essential in meeting the educational goals and administrative requirements of the program.

II.D. **Resources**

The institution and the program must jointly ensure the availability of adequate resources for resident education, as defined in the specialty program requirements.

- II.D.1. The program must provide adequate space, equipment, and other pertinent facilities to ensure an effective educational experience for residents in diagnostic radiology. The program must also provide the modern facilities and equipment required in all of the subspecialty rotations.
- II.D.2. There must be secure on-site call facilities for residents at locations where in-house call is required.
- II.D.3. The ACR teaching file or its equivalent must be available to residents.
- II.D.4. The program must provide a sufficient volume and variety of patients to ensure that residents gain experience in the full range of radiologic examinations, procedures, and interpretations. The number and variety of examinations and the length of rotations in each subspecialty area must be sufficient to ensure an adequate training experience. The program's volume must be no fewer than 7,000 radiologic examinations per year per resident. The number of examinations in each of the nine subspecialty areas must be of sufficient volume to ensure adequate training experience.

II.E. Medical Information Access

Residents must have ready access to specialty-specific and other appropriate reference material in print or electronic format. Electronic medical literature databases with search capabilities should be available.

III. Resident Appointments

III.A. Eligibility Criteria

The program director must comply with the criteria for resident eligibility as specified in the Institutional Requirements.

III.B. Number of Residents

The program director may not appoint more residents than approved by the Review Committee, unless otherwise stated in the specialty-specific requirements. The program's educational resources must be adequate to support the number of residents appointed to the program.

III.B.1. The program must have a minimum of eight residents.

III.B.2. Prior approval by the Review Committee is required for a change in the approved resident complement.

III.C. Resident Transfers

III.C.1. Before accepting a resident who is transferring from another program, the program director must obtain written or electronic verification of previous educational experiences and a summative competency-based performance evaluation of the transferring resident.

III.C.2. A program director must provide timely verification of residency education and summative performance evaluations for residents who leave the program prior to completion.

III.D. Appointment of Fellows and Other Learners

The presence of other learners (including, but not limited to, residents from other specialties, subspecialty fellows, PhD students, and nurse practitioners) in the program must not interfere with the appointed residents' education. The program director must report the presence of other learners to the DIO and GMEC in accordance with sponsoring institution guidelines.

IV. Educational Program

IV.A. The curriculum must contain the following educational components:

IV.A.1. Overall educational goals for the program, which the program must distribute to residents and faculty annually;

IV.A.2. Competency-based goals and objectives for each assignment at each educational level, which the program must distribute to residents and faculty annually, in either written or electronic form. These should be reviewed by the resident at the start of each rotation;

IV.A.3. Regularly scheduled didactic sessions; and,

IV.A.4. Delineation of resident responsibilities for patient care, progressive responsibility for patient management, and supervision of residents over the continuum of the program.

IV.A.5. ACGME Competencies

The program must integrate the following ACGME competencies into the curriculum:

IV.A.5.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:

IV.A.5.a).(1) should provide patient care through safe, efficient, appropriately utilized, quality-controlled diagnostic and/or interventional radiology techniques. The resident must communicate effectively and in a timely manner the results of procedures, studies, and examinations to the referring physician and/or other appropriate individuals;

IV.A.5.a).(2) must have a minimum of 700 hours (approximately four months) of training and experience in clinical nuclear medicine, which may include the required 80 hours of classroom and laboratory instruction (Section IV.A.5.b.1.a.iii);

IV.A.5.a).(2).(a) each resident must participate with preceptors in at least three therapies involving oral administration of I-131. Documentation of the resident's participation must include the date, diagnosis, and dose of each I-131 therapy;

IV.A.5.a).(3) must have a minimum of 12 weeks of clinical rotations in breast imaging. Each resident must have documentation of the interpretation/multi-reading of at least 240 mammograms within a six-month period during their last

two years of the residency program;

IV.A.5.a).(4) must have documented supervised experience in interventional procedures. This includes image-guided biopsies, drainage procedures, angioplasty, embolization and infusion procedures, and other percutaneous - interventional procedures;

IV.A.5.a).(4).(a) the residents must document the performance, interpretation, and complications of vascular, interventional, and invasive procedures;

IV.A.5.a).(5) must have training and clinical experience in the acquisition and interpretation of conventional radiography, computed tomography, magnetic resonance imaging, angiography, and nuclear radiology examinations of the cardiovascular system (heart and great vessels). This training must include studies performed on both adults and children; and,

IV.A.5.a).(6) must maintain current basic life-support (BLS) certification. Advanced cardiac life-support (ACLS) training is recommended.

IV.A.5.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:

IV.A.5.b).(1) must repeat, at least every two years, the core didactic curriculum. This curriculum must be documented, and should consist of subspecialty clinical content and general content.

IV.A.5.b).(1).(a) Subspecialty Didactic Content

IV.A.5.b).(1).(a).(i) There must be a didactic component for each of the nine subspecialty areas, including the heart and coronary arteries. The content should include the following in all age groups: anatomy, physiology, disease processes, and imaging.

IV.A.5.b).(1).(a).(ii) Each of the nine designated subspecialty chiefs 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.

IV.A.5.b).(1).(a).(iii)

There must be at least 80 hours of didactic (classroom and laboratory training) training under the direction of an authorized user (AU). This training must include the following subjects as they relate to nuclear medicine:

IV.A.5.b).(1).(a).(iii).(a)

diagnostic radiologic physics, instrumentation, and radiation biology;

IV.A.5.b).(1).(a).(iii).(b)

patient and medical personnel safety (i.e., radiation protection);

IV.A.5.b).(1).(a).(iii).(c)

the chemistry of by-product material for medical use;

IV.A.5.b).(1).(a).(iii).(d)

biologic and pharmacologic actions of materials administered in diagnostic and therapeutic procedures; and,

IV.A.5.b).(1).(a).(iii).(e)

topics in safe handling, administration, and quality control of radionuclide doses used in clinical medicine.

IV.A.5.b).(1).(a).(iv)

The didactic instruction (or work experience) must include ordering, receiving, and unpacking radioactive material safely, and performing the related radiation surveys; the 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; safe handling and administration of therapeutic doses of unsealed radionuclide sources (i.e., I-131); written directives; response to radiation spills and accidents (containment and decontamination procedures); radiation signage and related materials; using administrative controls to prevent medical events involving the use of unsealed byproduct material. Residents must demonstrate hands-on work experience when they perform the supervised work experience requirements. Observation alone is not sufficient.

IV.A.5.b).(1).(b)	General Didactic Content
IV.A.5.b).(1).(b).(i)	There must be didactic components that address the following subjects:
IV.A.5.b).(1).(b).(i).(a)	diagnostic radiologic physics and radiation biology;
IV.A.5.b).(1).(b).(i).(b)	patient and medical personnel safety (i.e., radiation protection, MRI safety);
IV.A.5.b).(1).(b).(i).(c)	appropriate imaging utilization (proper sequencing; cost-benefit analysis);
IV.A.5.b).(1).(b).(i).(d)	radiologic/pathologic correlation; (This requirement may be satisfied by resident participation in a formal course on radiologic-pathologic correlation.)
IV.A.5.b).(1).(b).(i).(e)	fundamentals of molecular imaging;
IV.A.5.b).(1).(b).(i).(f)	biologic and pharmacologic actions of materials administered in diagnostic or therapeutic procedures;
IV.A.5.b).(1).(b).(i).(g)	use of needles, catheters, and other devices employed in invasive image-based diagnostic and therapeutic procedures;
IV.A.5.b).(1).(b).(i).(h)	socioeconomics of radiologic practice; and,
IV.A.5.b).(1).(b).(i).(i)	professionalism and ethics.

IV.A.5.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:

IV.A.5.c).(1)	identify strengths, deficiencies, and limits in one's knowledge and expertise;
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- IV.A.5.c).(2) set learning and improvement goals;
- IV.A.5.c).(3) identify and perform appropriate learning activities;
- IV.A.5.c).(4) systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;
- IV.A.5.c).(5) incorporate formative evaluation feedback into daily practice;
- IV.A.5.c).(6) locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems;
- IV.A.5.c).(7) use information technology to optimize learning; and,
- IV.A.5.c).(8) participate in the education of patients, families, students, residents and other health professionals.
- IV.A.5.c).(9) evaluate their personal practice, utilizing scientific evidence, "best practices", and self-assessment programs with the intent of practice improvement. Evidence of this reflective process must result in the annual documentation of an individual learning plan. These learning plans must be part of the residents' learning portfolio;
- IV.A.5.c).(10) demonstrate a skill set that allows them to access, interpret, and apply best scientific evidence to the care of patients (evidence based medicine); and,
- IV.A.5.c).(11) demonstrate on an ongoing basis an awareness of radiation exposure, protection, and safety, as well as the application of these principles in imaging.

IV.A.5.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 are expected to:

- IV.A.5.d).(1) communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
- IV.A.5.d).(2) communicate effectively with physicians, other health professionals, and health related agencies;

- IV.A.5.d).(3) **work effectively as a member or leader of a health care team or other professional group;**
- IV.A.5.d).(4) **act in a consultative role to other physicians and health professionals; and,**
- IV.A.5.d).(5) **maintain comprehensive, timely, and legible medical records, if applicable.**
- IV.A.5.d).(6) communicate effectively with patients, colleagues, referring physicians, and other members of the health care team concerning imaging appropriateness, informed consent, safety issues, and the results of imaging tests or procedures. Competence in oral communication must be judged through direct observation. Competence in written communication must be judged on the basis of the quality and timeliness of dictated reports, and
- IV.A.5.d).(7) when they are senior residents, to have experience supervising or acting as consultants to and teaching medical students and residents.

IV.A.5.e) Professionalism

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

- IV.A.5.e).(1) **compassion, integrity, and respect for others;**
- IV.A.5.e).(2) **responsiveness to patient needs that supersedes self-interest;**
- IV.A.5.e).(3) **respect for patient privacy and autonomy;**
- IV.A.5.e).(4) **accountability to patients, society and the profession; and,**
- IV.A.5.e).(5) **sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.**

IV.A.5.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 are expected to:

- IV.A.5.f).(1) **work effectively in various health care delivery settings and systems relevant to their clinical specialty;**
- IV.A.5.f).(2) **coordinate patient care within the health care system relevant to their clinical specialty;**
- IV.A.5.f).(3) **incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;**
- IV.A.5.f).(4) **advocate for quality patient care and optimal patient care systems;**
- IV.A.5.f).(5) **work in interprofessional teams to enhance patient safety and improve patient care quality; and,**
- IV.A.5.f).(6) **participate in identifying system errors and implementing potential systems solutions.**
- IV.A.5.f).(7) demonstrate an understanding of how the components of the local and national healthcare system function interdependently, and how changes to improve the system involve group and individual efforts. The residents must function as consultants for other health care professionals, and act as a resource for information regarding the most appropriate use of imaging resources, and
- IV.A.5.f).(8) be trained to identify existing systems problems that compromise their ability to provide the most efficient and effective patient care. They must be trained to analyze systematically the problems, develop solutions, implement solutions, and evaluate the effectiveness of the intervention. Systems-based problems can be identified at the departmental, institutional, local, or national level. Evidence of participation in identifying system errors and implementing potential systems solutions must be documented in the resident's learning portfolio.

IV.B. Residents' Scholarly Activities

IV.B.1. The curriculum must advance residents' knowledge of the basic principles of research, including how research is conducted, evaluated, explained to patients, and applied to patient care.

IV.B.2. Residents should participate in scholarly activity.

IV.B.2.a) Residents must have training in critical thinking skills and research design (e.g., lectures, journal club, etc.).

IV.B.2.b) During their training, all residents must engage in a scholarly project under faculty supervision. This may take the form of laboratory research, or clinical research, or the analysis of disease processes, imaging techniques, or practice management issues. The results of such projects must be published or presented at institutional, local, regional, or national meetings, and included in the resident's learning portfolio. The program must specify how each project will be evaluated.

IV.B.3. The sponsoring institution and program should allocate adequate educational resources to facilitate resident involvement in scholarly activities.

V. Evaluation

V.A. Resident Evaluation

V.A.1. Formative Evaluation

V.A.1.a) The faculty must evaluate resident performance in a timely manner during each rotation or similar educational assignment, and document this evaluation at completion of the assignment.

V.A.1.b) The program must:

V.A.1.b).(1) provide objective assessments of competence in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice;

V.A.1.b).(2) use multiple evaluators (e.g., faculty, peers, patients, self, and other professional staff);

V.A.1.b).(3) document progressive resident performance improvement appropriate to educational level; and,

V.A.1.b).(4) provide each resident with documented semiannual evaluation of performance with feedback.

V.A.1.b).(5) ensure that assessment includes the following:

V.A.1.b).(5).(a) Global faculty evaluation (all competencies)

V.A.1.b).(5).(b) 360 Evaluation (for interpersonal skills/communication and professionalism)

V.A.1.b).(5).(c)	Resident Learning Portfolio: This portfolio, maintained by each resident, must include, at a minimum, documentation of the following:
V.A.1.b).(5).(c).(i)	Patient Care
V.A.1.b).(5).(c).(i).(a)	Case/procedure log;
V.A.1.b).(5).(c).(ii)	Medical Knowledge
V.A.1.b).(5).(c).(ii).(a)	documentation of conferences attended, courses/meetings attended, self-assessment modules completed, etc.;
V.A.1.b).(5).(c).(ii).(b)	documentation of compliance with regulatory-based training requirements in nuclear medicine and breast imaging; and,
V.A.1.b).(5).(c).(ii).(c)	documentation of performance on yearly objective examination;
V.A.1.b).(5).(c).(iii)	Practice-based Learning and Improvement
V.A.1.b).(5).(c).(iii).(a)	Annual resident self-assessment and learning plan;
V.A.1.b).(5).(c).(iv)	Interpersonal and Communication Skills
V.A.1.b).(5).(c).(iv).(a)	Formal evaluation of quality of dictated Reports;
V.A.1.b).(5).(c).(v)	Professionalism
V.A.1.b).(5).(c).(v).(a)	documentation of compliance with institutional and departmental policies (e.g., HIPAA, JCAHO, patient safety, infection control, dress code, etc.);
V.A.1.b).(5).(c).(v).(b)	status of medical license, if appropriate;
V.A.1.b).(5).(c).(vi)	Systems-Based Practice
V.A.1.b).(5).(c).(vi).(a)	Documentation of a learning activity that involves deriving a solution to a system problem at the departmental, institutional, local or national level;

V.A.1.b).(5).(c).(vii)	Scholarly Activities
V.A.1.b).(5).(c).(vii).(a)	Documentation of scholarly activity, such as publications, announcement of presentations, etc.; and,
V.A.1.b).(5).(c).(viii)	Other
V.A.1.b).(5).(c).(viii).(a)	Any materials pertinent to the educational experience of residency training.

V.A.1.c) The evaluations of resident performance must be accessible for review by the resident, in accordance with institutional policy.

V.A.1.d) Residents should be advanced to positions of higher responsibility only on the basis of their satisfactory progressive professional growth and scholarship. More frequent reviews of performance for residents experiencing difficulties or receiving unfavorable evaluations are required. When a resident fails to progress satisfactorily, a written plan identifying the problems and addressing how they can be corrected must be discussed with and signed by the resident and placed in his or her individual file.

V.A.2. Summative Evaluation

The program director must provide a summative evaluation for each resident upon completion of the program. This evaluation must become part of the resident's permanent record maintained by the institution, and must be accessible for review by the resident in accordance with institutional policy. This evaluation must:

V.A.2.a) document the resident's performance during the final period of education, and

V.A.2.b) verify that the resident has demonstrated sufficient competence to enter practice without direct supervision.

V.B. Faculty Evaluation

V.B.1. At least annually, the program must evaluate faculty performance as it relates to the educational program.

V.B.2. These evaluations should include a review of the faculty's clinical teaching abilities, commitment to the educational program, clinical knowledge, professionalism, and scholarly activities.

V.B.3. This evaluation must include at least annual written confidential evaluations by the residents.

V.B.4. The chair should ensure that confidential faculty evaluations by residents occur annually. Faculty must receive annual feedback from these resident evaluations.

V.C. Program Evaluation and Improvement

V.C.1. The program must document formal, systematic evaluation of the curriculum at least annually. The program must monitor and track each of the following areas:

V.C.1.a) resident performance;

V.C.1.b) faculty development;

V.C.1.c) graduate performance, including performance of program graduates on the certification examination; and,

V.C.1.d) program quality. Specifically;

V.C.1.d).(1) Residents and faculty must have the opportunity to evaluate the program confidentially and in writing at least annually; and,

V.C.1.d).(2) The program must use the results of residents' assessments of the program together with other program evaluation results to improve the program.

V.C.2. If deficiencies are found, the program should prepare a written plan of action to document initiatives to improve performance in the areas listed in section V.C.1. The action plan should be reviewed and approved by the teaching faculty and documented in meeting minutes.

V.C.3. During the most recent five year period, at least 50% of a program's graduates should pass the oral examination either on the first attempt or, if only one section is failed, should pass that section at the first opportunity.

VI. Resident Duty Hours in the Learning and Working Environment

VI.A. Principles

VI.A.1. The program must be committed to and be responsible for promoting patient safety and resident well-being and to providing a supportive educational environment.

VI.A.2. The learning objectives of the program must not be compromised by excessive reliance on residents to fulfill service obligations.

VI.A.3. Didactic and clinical education must have priority in the allotment of residents' time and energy.

VI.A.4. Duty hour assignments must recognize that faculty and residents collectively have responsibility for the safety and welfare of patients.

VI.B. Supervision of Residents

The program must ensure that qualified faculty provide appropriate supervision of residents in patient care activities.

VI.B.1. Faculty supervision must be available at all sites of training, and direct faculty supervision is required for all percutaneous invasive procedures, excluding intravenous injection of contrast.

VI.B.2. The responsibility or independence given to residents should depend on their knowledge, manual skills, and experience. The resident must have a minimum of 12 months of training in diagnostic radiology prior to independent in-house on-call responsibilities.

VI.B.3. Residents must always have faculty backup when taking night, weekend, or holiday call. All radiologic images must be reviewed and all reports must be signed by faculty. The reviews must occur within 24 hours.

VI.B.4. All residents must participate in taking call during the first six months of the final year of diagnostic radiology residency.

VI.C. Fatigue

Faculty and residents must be educated to recognize the signs of fatigue and sleep deprivation and must adopt and apply policies to prevent and counteract its potential negative effects on patient care and learning.

VI.D. Duty Hours (the terms in this section are defined in the ACGME Glossary and apply to all programs)

Duty hours are defined as all clinical and academic activities related to the program; i.e., patient care (both inpatient and outpatient), administrative duties relative to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled activities, such as conferences. Duty hours do not include reading and preparation time spent away from the duty site.

VI.D.1. Duty hours must be limited to 80 hours per week, averaged over a 4-week period, inclusive of all in-house call activities.

VI.D.2. Residents must be provided with 1 day in 7 free from all educational and clinical responsibilities, averaged over a 4-week period, inclusive of call.

- VI.D.3.** Adequate time for rest and personal activities must be provided. This should consist of a 10-hour time period provided between all daily duty periods and after in-house call.
- VI.E. On-call Activities**
- VI.E.1.** In-house call must occur no more frequently than every third night, averaged over a 4-week period.
- VI.E.2.** Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Residents may remain on duty for up to 6 additional hours to participate in didactic activities, transfer care of patients, conduct outpatient clinics, and maintain continuity of medical and surgical care.
- VI.E.3.** No new patients may be accepted after 24 hours of continuous duty.
- VI.E.3.a)** a new patient is defined as any patient for whom the resident has not previously provided care.
- VI.E.4. At-home call (or pager call)**
- VI.E.4.a)** The frequency of at-home call is not subject to the every-third- night, or 24+6 limitation. However at-home call must not be so frequent as to preclude rest and reasonable personal time for each resident.
- VI.E.4.b)** Residents taking at-home call must be provided with 1 day in 7 completely free from all educational and clinical responsibilities, averaged over a 4-week period.
- VI.E.4.c)** When residents are called into the hospital from home, the hours residents spend in-house are counted toward the 80-hour limit.
- VI.F. Moonlighting**
- VI.F.1.** Moonlighting must not interfere with the ability of the resident to achieve the goals and objectives of the educational program.
- VI.F.2.** Internal moonlighting must be considered part of the 80-hour weekly limit on duty hours.
- VI.G. Duty Hours Exceptions**
- An Review Committee may grant exceptions for up to 10% or a maximum of 88 hours to individual programs based on a sound educational rationale.

- VI.G.1.** In preparing a request for an exception the program director must follow the duty hour exception policy from the ACGME Manual on Policies and Procedures.
- VI.G.2.** Prior to submitting the request to the Review Committee, the program director must obtain approval of the institution's GMEC and DIO.
- VI.G.3.** The Review Committee for Diagnostic Radiology will not consider requests for duty hour exceptions.

VII. Experimentation and Innovation

Requests for experimentation or innovative projects that may deviate from the institutional, common and specialty specific program requirements must be approved in advance by the Review Committee. In preparing requests, the program director must follow Procedures for Approving Proposals for Experimentation or Innovative Projects located in the ACGME Manual on Policies and Procedures. Once a Review Committee approves a project, the sponsoring institution and program are jointly responsible for the quality of education offered to residents for the duration of such a project.

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