

Nuclear Medicine Summary and Impact of Major Program Requirement Revisions

Line Number(s): 89-92

I.A. Sponsoring Institution: The program director should be provided with no less than the equivalent of one day per week of protected time in order to fulfill the responsibilities inherent in carrying out the administrative activities and meeting the educational goals of the program.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Regularly scheduled administrative protected time gives the program director (PD) ready access to institutional resources (rather than after hours work and delayed responses in communicating/scheduling pertinent issues) which will enhance overall resident learning and will ultimately promote improvement in patient care. Dedicated time for the PD will also decrease the risk of “burn out” and less “hectic” clinical days during which the PD tries to incorporate administrative duties during hours that are targeted for clinical patient care. Also, this requirement will allow the PD to provide focused patient care without the disruption of administrative responsibilities.
- 2) **improves the quality of resident education;** Regularly scheduled administrative time will offer the PD more opportunities to enhance the educational program curriculum.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** Protected time enhances the program director’s ability to provide direct advocacy for the resident’s learning experiences.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** Protected administrative time can ensure that another faculty member covers the clinical duties for the PD who is addressing the administrative issues of the program. **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 5) **impacts residency education in other specialties.** This issue may occur if a PD creates resident rotations outside of Nuclear Medicine. This situation does not apply to residents in other specialties rotating in Nuclear Medicine.

Line Number(s): 124-128

I.B. Participating Sites: The program should be based at the primary clinical site. A program using multiple sites must ensure a unified educational experience for the residents. Each participating site must offer significant educational opportunities to the overall program.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** The primary site ensures continuity of the administrative and educational didactics at a central location; this furthers improvements in knowledge and patient care. Multi-site programs will provide a greater level of expertise in faculty, resources, and a greater variety of patient experiences with the ultimate goal of optimizing patient care.
- 2) **improves the quality of resident education;** The primary site ensures continuity of the administrative and educational requirements. Multi-site programs can offer residents access to a higher level of faculty expertise, more resources, and a greater variety of patient experiences. While such education is important, this requirement ensures a unified educational curriculum.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other**

- services; addition of faculty; financial impact); N/A**
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** Multiple participating sites will increase the exposure of the residents to a diverse patient population, resources, systems, and faculty.
 - 6) **impacts residency education in other specialties:** Multiple sites will allow a greater exposure to other specialties that may not have been available at the primary or other participating sites. This exposure can enhance the educational experience for both specialties.

Line Number(s): 154-157

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

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** If they are required to travel significant distances from their primary clinical site, patient care can be adversely affected if residents cannot participate in rounds and attend conferences where important clinical information is presented.
- 2) **improves the quality of resident education;** When residents can remain in close proximity to their primary clinical site, they have opportunities to take advantage of those institutional and programmatic resources that enhance the quality of their education.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** Spending time commuting between sites instead of addressing patient needs has a direct impact on the quality of care that residents deliver.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** This may require some programs to identify affiliations with institutions that are closer to the primary site.
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** Affiliations with sites that are closer to the primary site should never compromise the volume and variety of patients with whom residents are required to interact.
- 6) **impacts residency education in other specialties:** This is unlikely to be an issue.

Line Number(s): 186-189

II. A. Program Director: broad knowledge of, experience with, and commitment to general nuclear medicine and must have served as a nuclear medicine faculty member for at least one year preceding appointment as the program's director.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** N/A
- 2) **improves the quality of resident education;** This ensures that the PD will have at least one year during which to gain greater familiarity with the institutional systems, other faculty and residents, the graduate medical education process, and potentially receive mentoring from the exiting program director in order to maintain a certain "continuity" in the program's organization and curriculum.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A

- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 296-326

II.A. Program Director: [The program director must:] ensure that residents entering at the NM2 level achieve the required NM1 and NM2 competency outcomes by the completion of the NM2 year;

[The program director must:] ensure that residents entering at the NM3 level achieve the required NM1, NM2 and NM3 competency outcomes by the completion of the NM3 year;

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This ensures that residents completing the stated levels have achieved a certain level of competence in patient care.
- 2) **improves the quality of resident education;** This provides a more uniform outcome expectation for residents who complete the various program levels regardless of their prior training.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 365-370

II.B. Faculty: In programs affiliated with a medical school, all physician faculty must have an academic appointment.

In 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.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This ensures a certain level of excellence in the faculty, and hence, translates into quality patient care.
- 2) **improves the quality of resident education;** High quality faculty add high quality learning experiences to the program.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties:** High quality faculty will improve education for the program and other specialty residents.

Line Number(s): 399-400

II.B. Faculty: The faculty as a whole must have demonstrated ongoing participation in scholarly activities during the past five years

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Faculty members who remain current in their specialty will be able to deliver up-to-date and optimized care to their patients.
- 2) **improves the quality of resident education;** This ensures a process of continual learning and self-improvement for the faculty members who serve as role models for the resident.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** The ensures that faculty members impart up-to-date patient care knowledge to the residents.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** This enhances resident education in all programs.

Line Number(s): 402-406

II.B. Faculty: There must be at least one full-time equivalent physician faculty in addition to the program director.

Programs must maintain a ratio of at least one full-time equivalent physician faculty per two residents.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This adds a greater division of resident supervision which ultimately improves patient care (not left to one faculty).
- 2) **improves the quality of resident education;** This adds more faculty expertise to educate the program's residents and allows a division of teaching responsibilities with the PD. The 2:1 resident-to-faculty ratio will ensure that the faculty is not overburdened with teaching too many residents at one time.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** This ensure a reasonable division of resident and faculty work load in patient care.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** This requires one or more new faculty members if the program only had a program director.
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** This ensures a greater number of faculty to divide the educational experience.

Line Number(s): 415-417

II.C. Other Program Personnel: There must be a dedicated program coordinator to assist the program director in effectively fulfilling the administrative requirements of the program.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** N/A
- 2) **improves the quality of resident education;** This is designed to assist the PD with his/her administrative/clerical program responsibilities including improved organization, efficiency, and to provide the clerical support that allows the PD to concentrate on his/her larger administrative duties and the educational curriculum.
- 3) **affects the way the resident, the service, and the staff provide patients with**

- continuing care; N/A**
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** This may require the addition of a dedicated coordinator for the program.
 - 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A**
 - 6) **impacts residency education in other specialties. N/A**

Line Number(s): 441-442

II. D. Resources: There must be at least one dedicated computer with internet access for resident educational use.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Residents are able to obtain “just in time” learning through the Internet electronic database systems in order to improve their knowledge and optimize patient care.
- 2) **improves the quality of resident education;** Residents are able to use the multiple educational websites to expand their knowledge base and obtain up-to-date information in nuclear medicine and molecular imaging.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** Residents can access up-to-date information in patient care.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** The institution may need to purchase a dedicated computer for resident educational use.
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A**
- 6) **impacts residency education in other specialties.** Residents will be able to query patient care and educational concerns through the Internet and thereby enhance resident education in other specialties.

Line Number(s): 478-487

III. A. Eligibility Criteria: To be eligible for appointment to the program at the NM1 level, residents must have satisfactorily completed one year of education in a program accredited by the Accreditation Council for Graduate Medical Education (ACGME) or by the Royal College of Physicians and Surgeons of Canada (RCPSC).

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Accredited graduate medical education programs need to meet a certain standard of excellence in resident training which translates into a higher level of quality patient care.
- 2) **improves the quality of resident education;** Accredited programs have a certain uniform standard of excellence, and hence, provide a consistently high level of resident education which mirrors the standards for board certification.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** Accredited programs need to document their educational programs and resident experience which meet certain standard criteria.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact); N/A**
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A**
- 6) **impacts residency education in other specialties.** This supports admission for a

higher quality of residents.
Line Number(s): 489-490
III. A. Eligibility Criteria: <u>This year must include a minimum of nine months of direct patient care.</u>
Describe, as appropriate, how the revision: <ul style="list-style-type: none"> 1) impacts the quality and safety of patient care; This ensures that the resident has had the basic patient care experiences that are needed in nuclear medicine. 2) improves the quality of resident education; Residents will be better consultants if they understand the basic aspects of patient care. 3) affects the way the resident, the service, and the staff provide patients with continuing care; Residents will be better prepared for patient care responsibilities in nuclear medicine. 4) requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact); N/A 5) may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A 6) impacts residency education in other specialties. Residents will be better able to interact with their specialty peers in patient care issues.
Line Number(s): 492-503
III. A. Eligibility Criteria: <u>To be eligible for appointment to the program at the NM2 level, residents must have completed a residency program accredited by the ACGME or RCPSC. The educational program for these residents should be 24 months in length.</u>
<u>To be eligible for appointment to the program at the NM3 level, residents must have completed a residency program in diagnostic radiology accredited by the ACGME or RCPSC. The educational program for these residents should be 12 months in length.</u>
Describe, as appropriate, how the revision: <ul style="list-style-type: none"> 1) impacts the quality and safety of patient care; N/A 2) improves the quality of resident education; The concept of the NM1, NM2 and NM3 levels are in the current program requirements. Clearly defining a program level that accounts for prior training in an accredited program guides the program director to place residents into a shorter program if the trainee desires. 3) affects the way the resident, the service, and the staff provide patients with continuing care; N/A 4) requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact); The shortened program will allow a resident to complete the program in 12 or 24 months instead of 36 months. This will allow the program to accommodate more residents within its complement per unit time. This is not a new requirement but a clarification of the three pathways. 5) may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A 6) impacts residency education in other specialties. N/A
Line Number(s): 552-558
IV.A.3. Regularly scheduled didactic sessions: <u>There must be a dedicated formal didactic lecture schedule that indicates the specific date and time of each lecture, the topic of the lecture, the individual presenting the lecture, and the duration of the lecture.</u>

All residents must attend the regularly scheduled didactic lectures.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care**; N/A
- 2) **improves the quality of resident education**; This allows not only faculty members, but also non-faculty members or invited lecturers and residents to contribute to the didactic presentations, thereby expanding the level of expertise.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care**; N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact)**; Financial cost may be incurred if the invited non-faculty presenter is given a stipend for the presentation.
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s)**; N/A
- 6) **impacts residency education in other specialties**: If the lecture is applicable to other specialties, this can encourage expanded expertise if the non-faculty lecturer incorporates inter-specialty concepts within the presentation.

Line Number(s): 562-578

Diagnostic use of radiopharmaceuticals: clinical indications, technical performance, and interpretation of *in-vivo* imaging of the body organs and systems, using external detectors and scintillation cameras, including SPECT, SPECT/CT, PET, and PET/CT and correlation of nuclear medicine procedures with other pertinent imaging modalities;

Exercise and pharmacologic stress testing: the pharmacology of cardioactive drugs and physiologic gating techniques;

Non-imaging studies: training and experience in non-imaging procedures, such as radiolabeled antibody preparation, uptake measurements, and *in-vitro* studies;

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care**; Inclusion of these topics in the didactic lecture schedule will only enhance patient care.
- 2) **improves the quality of resident education**; Resident education that is offered in this structured format should have a direct impact on maintaining the quality of the curriculum.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care**; This proposed structure offers residents instruction for clinical application in patient settings including developing staff relationships to enhance patient care.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact)**; The structure can enhance planning for residents' clinical experiences and is unlikely to negatively affect the number of required faculty members or finances.
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s)**; The formal didactic lecture schedule should not alter patient volume or variety.
- 6) **impacts residency education in other specialties**. N/A

Line Number(s): 580-585

IV.A.3. Regularly scheduled didactic sessions: Therapeutic uses of unsealed

radiopharmaceuticals in the treatment of benign and malignant disorders: patient selection and management, including dosimetry, dose administration, toxicity, and radiation protection considerations; and

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This is currently in the current program requirements. However, the rewording ensures the appropriate selection of patients for radiotherapy procedures and subsequent up-to-date management for both benign and malignant diseases.
- 2) **improves the quality of resident education;** This increases resident understanding in radiotherapy with unsealed radiopharmaceuticals.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** This will teach residents the most current scientific evidence in the appropriate selection and management of radiotherapy patients utilizing unsealed radiopharmaceuticals.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 586-588

IV.A.3. Regularly scheduled didactic sessions: Fundamentals of existing and emerging molecular imaging techniques, particularly as they relate to current clinical practice.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Up-to-date scientific evidence, especially as it relates to clinical practice, will help to improve and optimize patient care.
- 2) **improves the quality of resident education;** Current scientific information in nuclear medicine and molecular imaging are important to keep up with the current concepts and practices, and to anticipate the concepts and practices of tomorrow.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** This will ensure that the didactics are based on up-to-date scientific evidence for patient care.
- 4) **requires a change in institutional resources (e.g., facilities; organization of services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties:** This ensures that residents will be knowledgeable about the concepts and practice of other specialties that interact with nuclear medicine and molecular imaging.

Line Number(s): 590-596

IV.A.3. Regularly scheduled didactic sessions: Basic Science Educational Program

All residents must complete a minimum of 200 hours of classroom and laboratory experience in basic radionuclide handling techniques applicable to the medical use of unsealed byproduct material and radionuclides requiring a written directive. This must include the following areas:

PREVIOUSLY: - must have didactic instruction in the following areas

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This ensures that a delineation is made on the basis of a minimum number of learning hours in using radionuclides in medicine which will promote patient safety.
- 2) **improves the quality of resident education;** This is the Nuclear Regulatory Commission's (NRC) minimal standard time frame for training and experience in the medical use of radionuclides. This specific number of hours is currently being met to satisfy federal NRC requirements, and had been in an older version of the program requirements but was dropped at the last revision. The requirement ensures compliance with the regulation and mimics the NRC wording, but includes "other radionuclides" besides byproduct material. Since the last program requirement revision, the NRC is now not only responsible for byproduct material but also cyclotron and generator produced radionuclides (the "other radionuclides"). The NRC has not updated this portion of their document. The addition of this wording will enhance the resident's education and patient safety.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 598-602

Radiation Physics and Instrumentation, including:

Radiation Physics: structure of matter, modes of radioactive decay, particle and photon emissions, and interactions of radiation with matter;

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** The basic science educational program that addresses radiation physics and instrumentation can only improve the quality and safety of patient care that residents deliver.
- 2) **improves the quality of resident education;** Resident education in radiation physics greatly improves the quality of their education.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** Continuing care for patients is enhanced by education in radiation physics which is an essential component of nuclear medicine.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** Some institutions may experience a financial impact based on the need to hire faculty members with this expertise.
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** This is unlikely.
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 604-613

IV.A.3. Regularly scheduled didactic sessions: Instrumentation: principles of instrumentation used in detection, measurement, and imaging of radioactivity with special emphasis on gamma cameras, including SPECT, SPECT/CT, PET and PET/CT systems, and associated electronic instrumentation and computers employed in image production and display. Instruction must be provided in the instrumentation principles of magnetic resonance imaging and multi-slice computed tomography; (PREVIOUSLY: including SPECT and PET devices)

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Adding fusion imaging with SPECT/CT and PET/CT will improve image interpretation for anatomic localization. This is the standard of care for PET imaging. This does not apply to SPECT imaging, because the CT portion of SPECT/CT is not reimbursed. The CT portion is invaluable, however, for image localization of an abnormality identified on the SPECT exam.
- 2) **improves the quality of resident education;** Fusion imaging with CT will enhance resident education in SPECT and PET techniques.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** This applies only if the institution purchases its own SPECT/CT or PET/CT systems.
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties:** This will improve image interpretation of these studies.

Line Number(s): 615-623

Radiation Protection and Regulations, including:

means of reducing radiation exposure, radiation dose limits, evaluation of radiation overexposure, medical management of persons overexposed to ionizing radiation, management and disposal of radioactive substances, and establishment of radiation safety programs in accordance with federal and state regulations;

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Inclusion of these regulations will only enhance patient safety.
- 2) **improves the quality of resident education;** Reviewing these regulations improves the quality of residents' educational experiences because they are better able to understand and apply the importance and intent of the regulations.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** These regulations are a reality for nuclear medicine physicians and should be applied during residency.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** Some institutions may experience a financial impact in enforcing the reduction of radiation exposure; however, it should be minimal.
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** This seems unlikely unless new affiliated sites must be identified for some reason.
- 6) **impacts residency education in other specialties.** Radiation protection and regulations may facilitate working with other specialties especially radiology.

Line Number(s): 625-627

IV.A.3. Regularly scheduled didactic sessions: Mathematics pertaining to the use and measurement of radioactivity, including statistics and medical decision making;

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This will help to assess a patient's dose pertinent to the procedure.
- 2) **improves the quality of resident education;** Understanding the calculation of an appropriate patient dose and how to measure this activity are important in nuclear medicine.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 629-635

Chemistry of radioactive material for medical use, including reactor, cyclotron, and generator production of radionuclides; radiochemistry; and formulation of radiopharmaceuticals; and,

Radiation biology: biological effects of ionizing radiation and calculation of radiation dose;

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Understanding radioactive material for medicine use will enhance patient communication and ultimately improve the quality and safety of patient care.
- 2) **improves the quality of resident education;** The effects of ionizing radiation and calculation of radiation dose are essential for practicing nuclear medicine.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 637-641

IV.A.3. Regularly scheduled didactic sessions: All residents and faculty must participate in regularly scheduled clinical nuclear medicine seminars, journal clubs and interdisciplinary conferences. Residents must present case materials and discuss relevant theoretical and patient management issues.

Describe, as appropriate, how the revision:

- 1) **Impacts the quality and safety of patient care;** Review and presentation of patient cases will enhance patient care particularly in a multi-disciplinary setting, journal club, and clinical case conference discussions. Portions, but not all, of this requirement are in the current program requirements. This paragraph consolidates the various components of patient care management issues that are scattered within the current document and makes it a more focused requirement for the resident.
- 2) **improves the quality of resident education;** Resident participation in the conferences referenced above will enhance their understanding of patient care, concepts, systems, and procedures.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** This adds an interdisciplinary approach with current scientific

- evidence and discussion.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** Resources are needed for multi-disciplinary conferences.
 - 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
 - 6) **impacts residency education in other specialties;** Improved relationships and understanding of other specialties are essential.

Line Number(s): 658-687

Patient Care

[Residents] ~~will~~ completing the NM1 year must demonstrate competency in:

initial patient evaluation to include pertinent ~~obtain~~ patient information relevant to the requested ~~test or therapy~~ procedure using patient interview, chart and computer data base review, the performance of a focused physical examination as indicated, and ~~contact~~ communication with the referring physician;

selection of appropriate nuclear medicine procedures in bone, thyroid, hepatobiliary, and cardiac imaging;

supervision of the performance of nuclear medicine procedures in bone, thyroid, hepatobiliary, and cardiac imaging as well as the preliminary review and interpretation of the resulting images;

therapeutic administration of radioiodine for benign thyroid disease including: patient selection, evaluating risks and benefits, determining the administered dose, patient identity verification, obtaining informed consent, documenting pregnancy status, using administrative controls to prevent a medical event, complying with federal and state regulations regarding medical use of radiopharmaceuticals, counseling patients and their families about radiation safety issues, and scheduling and performing post-therapy follow-up.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This provides a uniform standard of expectation for the educational and clinical outcomes that are expected after the completion of the first residency year (NM1).
- 2) **improves the quality of resident education;** Uniform and explicit expectations and standards will help the PD organize the first year of training.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties;** N/A

Line Number(s): 689-740

[Residents] completing the NM2 year must demonstrate competency in:

~~will select~~ selection of appropriate procedures(s) or therapy based on the referring

physician's request and the patient's history;

~~This involves selection of the appropriate radiopharmaceutical, dose, imaging technique, data analysis, basic supervisory skills, and image presentation, and preliminary interpretation in the performance of parathyroid, gastrointestinal, infection, pulmonary, urinary tract procedures, and positron emission tomography (PET studies. It also includes review of image quality, defining the need for additional images and correlation with other imaging studies such as x-rays, CT, MRI, or ultrasound;~~

the interpretation of PET studies performed for oncologic indications;

the preparation of radiopharmaceuticals including preparing patient doses and performing quality control measures;

~~will communicate results promptly and clearly to the referring physician or other appropriate health care workers. This communication should include clear and succinct dictation of the results;~~

~~will conduct the therapeutic administration of radioiodine for thyroid malignancy, procedures. Therapeutic procedures must be done in consultation with an attending physician who is a licensed user of radioactive material. These procedures should include including dose calculation, patient selection, evaluating risks and benefits, determining the administered does, patient identity verification, obtaining explanation of informed consent, documenting of pregnancy status, using administrative controls to prevent a medical event, complying with federal and state regulations regarding the medical use of radiopharmaceuticals, counseling of patients and their families on about radiation safety issues, and scheduling and performing post-therapy follow-up after therapy;~~

~~will maintain records (logs) of participation in nuclear cardiology pharmacologic and exercise studies, and in all types of therapy procedures;~~

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This provides a uniform standard of expectations for the educational and clinical outcomes that are to be met after completion of the second residency year (NM2). The explicit details describe the resident's skills and knowledge that are expected to be completed at end of this training year.
- 2) **improves the quality of resident education;** This ensures uniform and explicit expectations and standards to help the PD organize the second year in training.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 742-844

[Residents] completing the NM3 year must demonstrate competency in:

recommending, planning, conducting, supervising, interpreting, and reporting diagnostic and therapeutic nuclear medicine procedures appropriate for the clinical problem or condition;

correlating the nuclear medicine procedure with clinical information, laboratory, and other procedural or imaging studies;

interpreting positron emission tomography studies performed for non-oncologic indications;

therapeutic administration of radiopharmaceuticals including patient selection, evaluating risks and benefits, determining the administered dose, patient identity verification, obtaining informed consent, documenting pregnancy status, using administrative controls to prevent a medical event, complying with federal and state regulations regarding the medical use of radiopharmaceuticals, counseling patients and their families about radiation safety issues, and scheduling and performing post-therapy follow-up.

~~must be provided structured opportunities to~~ interpreting the following:

~~learn the indications, contraindications, complications, and limitations of specific procedures;~~ musculoskeletal studies for benign and malignant disease;

~~develop technical proficiency in performing these procedures;~~ myocardial perfusion imaging with treadmill and pharmacologic stress. This should include patient monitoring, with special emphasis on electrocardiographic interpretation;

~~learn to interpret the results of these procedures;~~ and ECG-gated ventriculography for evaluation of ventricular performance;

~~dictate reports and communicate results promptly and appropriately. The program must provide adequate opportunity for residents to participate in and personally perform and analyze a broad range of common clinical nuclear medicine procedures.~~ endocrinologic studies, including thyroid and parathyroid. Thyroid studies must include measurement of iodine uptake and dosimetry calculations for radio-iodine therapy;

gastrointestinal studies, including transit studies, liver and hepatobiliary, bleeding, and Meckel's diverticulum;

infection studies, including gallium, labeled leukocytes, and bone marrow imaging;

oncology studies, including sentinel node localization, fluorodeoxyglucose (FDG), adrenal, somatostatin-receptor imaging and other agents as they become available;

neurologic studies, including cerebral perfusion, cerebral metabolism and cerebrospinal fluid. This should include studies of dementia, epilepsy, and brain death;

pulmonary studies including perfusion and ventilation for pulmonary embolus, right-to-left shunts, and quantitative assessment of perfusion and ventilation;

urinary tract studies, including renal perfusion, function and cortical imaging, renal scintigraphy with pharmacologic interventions, and renal transplant evaluation;

cross-sectional imaging of the brain, head and neck, thorax, abdomen, and pelvis with CT in the context of SPECT/CT and PET/CT.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This supports more explicit in-patient therapy issues regarding resident expectations for radiotherapy procedures which will improve patient care.
- 2) **improves the quality of resident education;** Many of these requirements are stated in the current program requirements. The revision has deleted out-of date or little-used procedures in the current requirements so that the procedures will reflect a typical nuclear medicine practice. Items have been added including SPECT/CT and PET/CT and PET/CT in non-oncologic indications in order to keep the document current. The CT requirement is more explicit in the context of interpreting SPECT/CT and PET/CT.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** This provides more detailed expectations for radiotherapy procedures.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** The defined outcomes should improve resident learning and hence, improve consultations in other residency educational experiences.

Line Number(s): 979-989

[Residents] at all levels must:

demonstrate compliance with radiation safety rules and regulations, including NRC and/or agreement state rules, local regulations, and the ALARA (as low as is reasonably achievable) principle for radiation protection; and

have training in both basic life-support and maintain current certification in advanced cardiac life-support.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Compliance with radiation safety rules and regulations will have a positive impact on patient care and safety.
- 2) **improves the quality of resident education;** This is essential to resident education in nuclear medicine now and in the future.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper**

educational resources in the institution(s); N/A
6) impacts residency education in other specialties. N/A

Line Number(s): 998-1023

completing the NM1 year should demonstrate basic knowledge of radiation safety; nuclear medicine instrumentation including quality control; nuclear medicine procedures including bone scans, thyroid uptake and scans; radioiodine therapy for hyperthyroidism; hepatobiliary scans; myocardial perfusion; and gated ventriculography;

completing the NM2 year should demonstrate basic knowledge in radiopharmacy; nuclear medicine procedures including parathyroid, gastrointestinal, infection, pulmonary and urinary tract; radioiodine therapy for thyroid malignancy; positron emission tomography for oncologic indications; and cross-sectional imaging of the thorax, abdomen, and pelvis with CT in the context of SPECT-CT and PET/CT;

completing the NM3 year should demonstrate competence in their knowledge of all topics included in the didactic curriculum.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care; N/A**
- 2) **improves the quality of resident education;** This section was reorganized and the original items were placed in the appropriate sections of the new document. This revision is targeted at addressing knowledge and skills that are up-to-date by eliminating obsolete and seldom- performed studies. Also, the revision includes reworded content that is more concise. The 3-year division sets a level of competency for each completed year of training that is standardized across all programs (expected outcomes). If a resident transfers from one program to another, the completion outcomes for each year will allow an easier assessment and transition in the transfer process and provides a better separation in the three levels of training.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care; N/A**
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact); N/A**
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A**
- 6) **impacts residency education in other specialties. N/A**

Line Number(s): 1216-1218

regularly obtain follow-up information, which is essential for determining the accuracy of study interpretation, and correlate the clinical findings with their study interpretation.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Regular follow-up assessment of one's performance should improve patient care.
- 2) **improves the quality of resident education;** This is in the current requirement, but is more concise.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** A self-assessment process can lead to improved patient care.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact); N/A**
- 5) **may change the volume and variety of patients required to provide proper**

- educational resources in the institution(s); N/A**
- 6) **impacts residency education in other specialties.** This is likely to enhance inter-specialty interactions due to the need to interact for patient follow up, especially in radiotherapy procedures.

Line Number(s): 1220-1229

demonstrate the application of performance improvement principles by following scientific progress in nuclear medicine and molecular imaging; and,

evaluate their personal practice utilizing scientific evidence, best practices, and/or self-assessment programs or modules for practice improvement. This reflective process must be demonstrated as part of an individual learning plan in the resident's learning portfolio.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This will improve patient care through personal self-reflection projects and activities.
- 2) **improves the quality of resident education;** This requirement is already in the current and common program requirements. Reinforcing the requirement and specifying improvement principles in nuclear medicine and molecular imaging with self-reflection is more targeted. Examples are also given to help the PD comply. This also introduces the concept of a required resident learning portfolio.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** Yes, especially targeted for a "habit" of self-reflection.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** Some programs may need resources from the institution for self-improvement projects.
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A**
- 6) **impacts residency education in other specialties.** This should help improve performance in consultative interactions with other specialties.

Line Number(s): 1254-1302

demonstrate competence by the completion of the NM1 year in the following:

preparing a preliminary basic nuclear medicine procedure report; and,

communicating the final procedure results promptly and clearly to the referring physician;

demonstrate competence by the completion of the NM2 year in the following:

preparing a complete and concise nuclear medicine procedure interpretation report;

providing effective contributions to the interdisciplinary and clinical didactic conferences; and,

educating patients and their families in diagnostic and therapeutic nuclear medicine procedures;

demonstrate competence by the completion of the NM3 year in the following:

communicating the final procedure interpretation, an appropriate differential diagnosis,

and any clinical, diagnostic or therapeutic recommendations; and,
supervising and teaching junior residents, residents from other services, and students on rotations in nuclear medicine.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** This sets certain target points for communicating with patients and outlines components of the health care system including a concise and clear nuclear medicine report. Inter-disciplinary conferences are targeted for improved patient care.
- 2) **improves the quality of resident education;** This delineates a graduated level of expectation for the end of each training year. Also, it helps the PD with organization of the program's objectives to obtain the end-of-year goals.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** This targets clear communication skills which will improve overall health care delivery by the resident.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** This supports improvement of inter-specialty communication and education through multispecialty conferences and teaching other specialties while rotating through nuclear medicine.

Line Number(s): 1398-1444

Curriculum Organization and Resident Experiences ~~The Two-year Clinical Curriculum Content~~

Residents entering the program at any level must:

participate in a radiopharmacy rotation. This experience must include:

ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys;

performing quality control procedures on instruments used to determine the activity of dosages, and performing checks for proper operation of survey meters;

calculating, measuring, and safely preparing patient or human research subject dosages;

using administrative controls to prevent a medical event involving the use of unsealed byproduct material;

using procedures to safely contain spilled radioactive material and using proper decontamination procedures;

administering dosages of radioactive drugs to patients or human research subjects;

participate with appropriate supervision in the performance of nuclear medicine

imaging and non-imaging procedures to include instrumentation quality control;
participate in basic radiation safety and survey procedures;

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** N/A
- 2) **improves the quality of resident education;** This is a new section for the program requirements. These requirements are included in the current program requirements; however, placing them in this section clearly states what all residents must experience during their residency. Also, it helps the PD to provide a uniform curriculum and expectation.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 1446-1538

maintain a Resident Learning Portfolio. This portfolio must be maintained by each resident, must be reviewed with the program director as part of the semiannual evaluation, and must include the following:

Patient Care

documentation of participation in the following required nuclear medicine procedures:

ten cases of oral administration of less than or equal to 1.22 gigabecquerels (33 millicuries) of sodium iodide I-131, for which a written directive is required;

five cases of oral administration greater than 1.22 gigabecquerels (33 millicuries) of sodium iodide I-131, for which a written directive is required;

three cases of parenteral administration of any beta emitter, or a photon-emitting radionuclide with a photon energy less than 150 keV, for which a written directive is required and/or parenteral administration of any other radionuclide, for which a written directive is required; and,

50 cardiovascular pharmacologic and/or exercise stress studies.

documentation of participation in therapeutic procedures must include date, diagnosis, and dose of each therapy;

documentation of participation in stress myocardial studies must include date, radiopharmaceutical, and type of stress (exercise or pharmacologic); and,

It is suggested that residents document the completion of 25 pediatric

nuclear medicine procedures per year.

documentation of ACLS certification;

Medical Knowledge

documentation of conference presentations, external courses and meetings attended, and self-assessment modules completed;

documentation of compliance with regulatory-based training requirements; and,

documentation of performance on the annual in-training examination;

Practice-based Learning and Improvement

annual resident self-assessment and learning plan.

Interpersonal and Communication Skills

formal faculty evaluation of report quality;

Professionalism

documentation of compliance with institutional and departmental policies; and,

status of medical license;

Systems-based Practice

documentation of participation in identifying and implementing potential systems solutions;

Scholarly Activities

documentation of scholarly activity, such as publications, announcement of presentations;

any additional materials requested by the program director; and,

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** The activities in practice-based learning and improvement and systems-based practice are targeted to improve patient care. ACLS has long been a program requirement.
- 2) **improves the quality of resident education;** The resident learning portfolio is a new requirement aimed at documenting individual educational learning components. Residents must maintain their own portfolio and it must be part of the semi-annual evaluation with the PD.

Some of the listed components are in the current requirements. Others are new: 1) "three cases of parenteral-administration of any beta-emitter for which a written directive

is required” is new to reflect the NRC requirement. The prior requirement of three radiolabeled antibody therapies is not available in many programs, and hence is not a practical item and has been deleted. 2) The documentation method for radiotherapy and cardiac stress test is a new format that complies with HIPAA and provides the RC and NRC with the needed information. 3) Added the resident documentation of completing 25 pediatric nuclear medicine cases per year. The prior requirement addressed the availability of at least 100 pediatric nuclear medicine cases per year for the program. This is an institutional number and not an individual resident’s experience. Pediatric nuclear medicine is not a frequent procedure and hence, the RC will hope to capture the “average pediatric experience” per resident and then have information driven “benchmarks” for experience targets. 4) Resident documentation in outside learning experiences (i.e., formal courses or review courses, SAMs , external specialty conferences, or personal presentations at meetings) is now a requirement. This will help to emphasis the concept of continual learning and maintaining up-to-date knowledge and skills. 5) Learning plan documentation is a new requirement to help the resident focus on targets for learning – both short and long term. 6) Formal PD review of a resident’s dictated report is now a requirement – a communication skill process improvement. 7) The compilation of professional documents is a requirement (license, compliance certificates). 8) Participating in scholar activity is a new requirement. These activities are encouraged in the current program requirements but are not mandatory. As one moves into process improvements and MOC, such activities will be a part of one’s continuous learning habit.

- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 1544-1562

Residents entering the program at the NM1 level must:

participate in the stress component of myocardial perfusion exams;

participate in radioiodine therapy for benign thyroid disease;

participate with appropriate supervision in the performance of nuclear medicine procedures including bone scans, thyroid uptake and scans, hepatobiliary scans, and myocardial perfusion procedures;

formulate a scholarly activity or research project and identify a faculty mentor for this activity during the NM1 year; and,

have no more than 3 months of elective rotations during the program;

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** N/A
- 2) **improves the quality of resident education;** This assists the PD in designing the resident curriculum and learning experiences for the designated year. The 3 month

minimum elective requirement would allow no more than an average of 1 month per year of an elective rotation for the resident.

- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 1564-1586

Residents promoted to or entering the program at the NM2 level must:

participate in a minimum of 6 months of CT experience;

A minimum of 4 months must be obtained on a diagnostic radiology CT service and include experience in CT interpretation and report dictation;

This experience must be supervised by qualified faculty.

Residents who have satisfactorily completed an ACGME- or RCPSC-accredited diagnostic radiology residency are exempt from the requirement.

have no more than two months of elective rotations during the program. This does not apply to residents entering at the NM1 or NM3 level.

Residents entering the program at the NM3 level must have no more than one month of elective rotations.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** N/A
- 2) **improves the quality of resident education;** This delineates the targets for the 2 year resident and the resident promoted to the NM2 level. The current program requirements list 4 months of CT training which does not specify exactly how this must be accomplished, nor the CT rotational goal other than to be able to correlate the nuclear medicine abnormality with the anatomic structure on CT. Suggestions are made to have this CT experience be "counted" if one is reviewing PET/CT and SPECT/CT studies and that a dedicated CT rotation is desired but not required. This is the current situation.

Based on RC opinion and the fact that PET/CT has become the standard of care for oncologic imaging for many cancers, correlating anatomic CT structures is no longer acceptable. Acquiring a degree of interpretative CT skills in the context of PET/CT and SPECT/CT is an important factor. Therefore, the RC is requiring an additional 2 months of CT for a total of 6 months of CT training and requiring that 4 of these months be completed on a dedicated CT service. This latter requirement is explicit in the resident experience. The resident must gain CT experience on a dedicated CT service and must dictate the CT report. The radiologist (entering at the NM3 level) is generally in the one-year program and is exempt from this requirement.

The 2 and 1 month minimum elective requirement for the 2 and 1 year resident, respectively, is new so as not to detract from the required educational experiences.

- 3) **affects the way the resident, the service, and the staff provide patients with continuing care; N/A**
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact); N/A**
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A**
- 6) **impacts residency education in other specialties. N/A**

Line Number(s): 1540-1542; 1608-1619

All residents must participate in a scholarly project under faculty supervision.

The scholarly project should take the form of laboratory research, 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.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care; N/A**
- 2) **improves the quality of resident education; This encourages self learning, creativity and curiosity.**
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care; N/A**
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact); This may need to have institutional support for more complex scholarly projects or funding for meeting presentation.**
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A**
- 6) **impacts residency education in other specialties. N/A**

Line Number(s): 1657-1660

Residents must participate in the annual in-training examination. The results of this examination must be used only to identify deficiencies in knowledge and to assist in developing a remediation plan.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care; N/A**
- 2) **improves the quality of resident education; Participation in the in-training exam is already a program requirement. What is new is the use of the exam to identify learning gaps and to create a remediation plan for these deficiencies. This is another project for resident self-reflection and improvement.**
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care; N/A**
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact); This is related to the cost of the in-training exam.**
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s); N/A**

6) **impacts residency education in other specialties.** N/A

Line Number(s): 1688-1689

Faculty must receive annual feedback from these resident evaluations.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** N/A
- 2) **improves the quality of resident education;** Giving residents the option to evaluate faculty members and ensuring that the faculty members receive annual feedback from residents establishes an important dynamic for training programs.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 1720-1727

A program's graduates must achieve a pass rate on the American Board of Nuclear Medicine certifying examination of at least 50% for first-time takers of the examination in the past five years.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Higher board pass rates generally translate into a resident with a higher level of knowledge and skills in patient care issues.
- 2) **improves the quality of resident education;** This is a new requirement to measure program outcome on a national level. A program can then address its deficiencies that are identified in the areas of poor resident performance. The 50% minimum averaged over a 5-year period with at least 4 residents would objectively accommodate the many small programs in nuclear medicine.
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 1751-1763

Faculty supervision must be available at all sites of education.

Therapeutic procedures must be done under the direct supervision of a faculty physician who is an authorized user of the therapeutic material.

The level of responsibility or independence given to residents should be based on the resident's knowledge, skills, and experience.

Residents must always have physician faculty backup when taking night, weekend, or holiday call.

All nuclear medicine procedures done by residents must be reviewed, and all reports must be signed, by the supervising physician faculty.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** Appropriate faculty supervision will help to ensure patient safety and quality issues.
- 2) **improves the quality of resident education;** The requirement is new only in its narrative description, but is not new in concept. This will help the PD to document resident supervision at all participating sites, and is prescriptive regarding the setting of resident supervision and which faculty members are involved (i.e. authorized user, physician faculty).
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** N/A
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 1805-1806

A new patient is defined as any patient for whom the resident has not previously provided care within the past 24 hours.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** N/A
- 2) **improves the quality of resident education;** N/A
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** Generally, this is not applicable to nuclear medicine because it relates to duty hours.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A

Line Number(s): 1823-1824

Residents must have on-call responsibilities and provide consultation for emergency procedures performed during the time they are on-call.

Describe, as appropriate, how the revision:

- 1) **impacts the quality and safety of patient care;** N/A
- 2) **improves the quality of resident education;** N/A
- 3) **affects the way the resident, the service, and the staff provide patients with continuing care;** This is an important experience for residents as part of their call responsibilities.
- 4) **requires a change in institutional resources (e.g., facilities; organization of other services; addition of faculty; financial impact);** N/A
- 5) **may change the volume and variety of patients required to provide proper educational resources in the institution(s);** N/A
- 6) **impacts residency education in other specialties.** N/A