Background

According to the American Board of Medical Specialties (ABMS), a radiologist is a physician who uses imaging methodologies to diagnose and manage patients and provide therapeutic options.

The American Board of Radiology (ABR) defines nuclear radiology as the subspecialty of diagnostic radiology that encompasses the use of radiopharmaceuticals for dynamic and static imaging of pathophysiologic processes and the treatment of a spectrum of benign and malignant diseases. Nuclear radiology includes employment of hybrid technology such as PET/CT imaging for diagnosis, assessment, and treatment monitoring.

Physicians wishing to apply for subspecialty certification in nuclear radiology through the ABR must successfully complete a one-year fellowship program in nuclear radiology following completion of a diagnostic radiology residency program. Residency training to become a diagnostic radiologist includes one year of clinical work, followed by four years of radiology training.

For more information, please see the following Clinical Privilege White Papers:
- Practice area 146—Nuclear medicine
- Practice area 159—Diagnostic radiology

Involved specialties

Nuclear radiologists, diagnostic radiologists, nuclear medicine physicians

Positions of specialty boards

**ABR**

To become certified in the subspecialty of nuclear radiology through the ABR, physicians must:
- Be previously certified in diagnostic radiology by the ABR
- Successfully complete one year of documented fellowship training in a nuclear radiology program accredited by the Accreditation Council for Graduate Medical Education (ACGME) or the Royal College of Physicians and Surgeons of Canada (RCPSC)
- Provide evidence of a current state medical license with an expiration date
• Pass the nuclear radiology subspecialty examination within 10 years of completing subspecialty training

Under current rules, no credit will be given for any nuclear training obtained during the four years of diagnostic radiology training. However, the ABR has approved conditions and requirements for a new pathway leading to eligibility for both diagnostic radiology primary certification and nuclear radiology subspecialty certification. Residents who complete 16 months of nuclear medicine training within a four-year ACGME-accredited radiology program are eligible for this new pathway, which has the following requirements:

• The 48-month radiology residency must include 16 months of nuclear medicine
• During residency, 10 of these months must be consecutive to preserve clinical care and learning continuity mimicking the experience of traditional fellowship pathways
• Up to two months of nuclear medicine training in the clinical year may count toward the 16-month requirement, if obtained in an institution with an ACGME-accredited diagnostic radiology residency
• The sponsoring diagnostic radiology residency program must be in an institution with either an ACGME-accredited nuclear radiology fellowship or an ACGME-accredited nuclear medicine residency program
• The program must fulfill the ABR requirements for Nuclear Regulatory Commission (NRC) training and experience, leading to an authorized user-eligible diagnostic radiology certificate

Trainees completing such a program will be admitted to the ABR certifying examination at 15 months postresidency. After certification in diagnostic radiology, the DR diplomate may take the nuclear radiology subspecialty examination at the earliest opportunity. No additional interval clinical experience is required.

Two alternate pathways to subspecialty certification are available:

• A diplomate of the ABR may attain subspecialty certification without taking an accredited fellowship if he or she is on the subspecialty faculty at an institution with an ACGME-accredited fellowship in that discipline. Serving on the subspecialty faculty at a single institution for two consecutive years with at least a 0.75 full-time equivalent (FTE) in that discipline, or for three consecutive years with at least a 0.50 FTE in that discipline, would qualify the faculty member to take the initial subspecialty examination.
• From July 1, 2013, to December 31, 2013, a diplomate of the ABR with lifetime certification may regain an opportunity to attain subspecialty certification when more than 10 years have passed since the completion of a fellowship. A candidate must have completed 12 months of either an ACGME-accredited fellowship or a 12-month fellowship that was in place before ACGME began the nuclear radiology accreditation process (1988). In addition, the candidate’s current practice must consist of at least 60% in the subspecialty.
The ABMS and the ABR, as a member board, have initiated a maintenance of certification (MOC) process that is designed to facilitate and document the professional development of each diplomate through its focus on the essential elements of quality care. Nuclear radiology MOC is for diplomates who are already ABR-certified in nuclear radiology and are working in the 10-year cycle of maintaining that certification. MOC requirements to maintain certifications in both diagnostic radiology and nuclear radiology may be fulfilled with a single MOC program.

Positions of societies, academies, colleges, and associations

ACGME

In its Program Requirements for Graduate Medical Education in Nuclear Radiology, the ACGME states that fellowship programs in nuclear radiology must be 12 months in length. Prerequisite education for entry into the fellowship program should include the satisfactory completion of a diagnostic radiology residency program accredited by the ACGME or the RCPSC.

Nuclear radiology fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. They must provide consultation with referring physicians or services and should actively participate in educating diagnostic radiology residents and, if appropriate, medical students and other professional personnel in the care and management of patients. Fellows must follow standards of care for practicing in a safe environment, attempt to reduce errors, and improve patient outcomes. They must perform and interpret all specified exams and/or invasive studies under close, graded responsibility and supervision. Fellows must demonstrate competence interpreting the following:

- **Cardiac imaging**, including:
  - Myocardial perfusion imaging procedures performed with radioactive perfusion agents in association with treadmill and pharmacologic stress testing (planar and tomographic, including gated tomographic imaging)
  - Radionuclide ventriculography performed with electrocardiogram (ECG) gating for evaluation of ventricular performance

- **Endocrinologic studies**, including thyroid and parathyroid imaging, as well as octreotide and other receptor-based imaging studies

- **Gastrointestinal studies** of the salivary glands, esophagus, stomach, and liver, both reticuloendothelial function and the biliary system, also to include studies of gastrointestinal bleeding and Meckel’s diverticulum

- **Genitourinary tract studies**, including renal perfusion and function procedures, renal scintigraphy with pharmacologic interventions, renal transplant evaluation, and vesicoureteral reflux

- **Musculoskeletal studies**, including bone scanning for benign and malignant disease

- **Neurologic studies**, including cerebral perfusion with both SPECT and/or PET, cisternography, and cerebral spinal fluid (CSF) flow studies
Nuclear radiology

Practice area 436

- PET imaging, including:
  - The brain, to include studies of dementia, epilepsy, and brain tumors
  - Myocardial perfusion studies
  - Oncology, to include studies of tumors of the lung, head and neck, esophagus, colon, thyroid, and breast, as well as melanoma, lymphoma, and other tumors as the indications become established

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

- Pulmonary studies of perfusion and ventilation performed with radiolabeled macroaggregates and radioactive gas or aerosols, for both diagnostic and quantitative assessment of perfusion and ventilation

Fellows must be able to competently perform all medical, diagnostic, and surgical procedures considered essential for the area of practice. Fellows must:

- Apply low-dose radiation techniques in both adults and children.
- Participate in therapeutic administration of radiopharmaceuticals, including patient selection, informed consent, understanding and calculating of the administered dose, counseling patients and their families on radiation safety issues, and patient follow-up after therapy. Documentation of specific applications should include participation in a minimum of:
  - 10 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
  - 5 cases of oral administration of greater than 1.22 gigabecquerels (33 millicuries) of sodium iodide I 131, for which a written directive is required
  - 5 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
- Demonstrate competence in performing pediatric nuclear radiology cases (a minimum of 100 cases must be performed)
- Maintain current basic life support certification

With regard to medical knowledge, fellows 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. Fellows must:

- Demonstrate a level of expertise in the knowledge of those areas appropriate for a nuclear radiology specialist, including radiation safety rules and regulations (those set by the NRC and/or other agreements stating rules and local regulations), the ALARA (as low as reasonably achievable) principles, personnel occupational radiation exposure, and radiation protection
- Demonstrate knowledge of low-dose radiation techniques in both adults and children and how to prevent and/or treat complications of contrast administration
• Develop skills in preparing and presenting educational material for medical students, graduate medical staff, and allied health personnel

In addition, fellows must demonstrate a level of expertise in the knowledge of the following didactic curricular topics:
• Diagnostic imaging and non-imaging nuclear radiology application and therapeutic applications:
  - Diagnostic use of radiopharmaceuticals, to include clinical indications, technical performance, and interpretation of in vivo imaging of the body organs and systems, and using external detectors and scintillation cameras, including SPECT and PET
  - Exercise and pharmacologic stress testing, to include the pharmacology of cardioactive drugs and physiologic gating techniques
  - Non-imaging studies: application of a variety of non-imaging procedures, including instruction in the principles of radioimmunology, preparation of radiolabeled antibodies, uptake measurements, and in vitro studies
  - Techniques and applications of molecular imaging and fusion imaging
  - Therapeutic uses of unsealed radiopharmaceuticals, to include: patient selection and management, including dose administration and dosimetry, radiation toxicity, and radiation protection considerations in the treatment of metastatic cancer and bone pain, primary neoplasms, solid tumors, and malignant effusions; and the treatment of hematologic, endocrine, and metabolic disorders
• Instrumentation: principles of instrumentation used in detection, measurement, and imaging of radioactivity with special emphasis on gamma cameras, including SPECT and PET devices, as well as software image fusion methodologies
• Physics: structure of matter, modes of radioactive decay, particle and photon emissions, and interactions of radiation with matter
• Radiation biology and protection: biological effects of ionizing radiation, means of reducing radiation exposure, calculation of the radiation dose, 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
• Radiopharmaceuticals: reactor, cyclotron, and generator production of radionuclides, radiochemistry, pharmacokinetics, and formulation of radiopharmaceuticals

**AOA**

The American Osteopathic Association (AOA) no longer issues primary certification in nuclear medicine or a certificate of added qualifications in nuclear radiology.
Positions of accreditation bodies

**CMS**

CMS has no formal position concerning the delineation of privileges for nuclear radiology. However, the CMS *Conditions of Participation (CoP)* define a requirement for a criteria-based privileging process in §482.22(c)(6) stating, “The bylaws must include criteria for determining the privileges to be granted to individual practitioners and a procedure for applying the criteria to individuals requesting privileges.”

§482.12(a)(6) states, “The governing body must assure that the medical staff bylaws describe the privileging process. The process articulated in the bylaws, rules or regulations must include criteria for determining the privileges that may be granted to individual practitioners and a procedure for applying the criteria to individual practitioners that considers:

- Individual character
- Individual competence
- Individual training
- Individual experience
- Individual judgment

The governing body must ensure that the hospital’s bylaws governing medical staff membership or the granting of privileges apply equally to all practitioners in each professional category of practitioners.”

Specific privileges must reflect activities that the majority of practitioners in that category can perform competently and that the hospital can support. Privileges are not granted for tasks, procedures, or activities that are not conducted within the hospital, regardless of the practitioner’s ability to perform them.

Each practitioner must be individually evaluated for requested privileges. It cannot be assumed that every practitioner can perform every task, activity, or privilege specific to a specialty, nor can it be assumed that the practitioner should be automatically granted the full range of privileges. The individual practitioner’s ability to perform each task, activity, or privilege must be individually assessed.

CMS also requires that the organization have a process to ensure that practitioners granted privileges are working within the scope of those privileges.

CMS’ *CoPs* include the need for a periodic appraisal of practitioners appointed to the medical staff/granted medical staff privileges (§482.22[a][1]). In the absence of a state law that establishes a time frame for the periodic appraisal, CMS recommends that an appraisal be conducted at least every 24 months. The purpose of the periodic appraisal is to determine whether clinical privileges or membership should be continued, discontinued, revised, or otherwise changed.
The Joint Commission

The Joint Commission has no formal position concerning the delineation of privileges for nuclear radiology. However, in its *Comprehensive Accreditation Manual for Hospitals*, The Joint Commission states, “The hospital collects information regarding each practitioner’s current license status, training, experience, competence, and ability to perform the requested privilege” (MS.06.01.03).

In the introduction for MS.06.01.03, The Joint Commission states that there must be a reliable and consistent system in place to process applications and verify credentials. The organized medical staff must then review and evaluate the data collected. The resultant privilege recommendations to the governing body are based on the assessment of the data.

The Joint Commission introduces MS.06.01.05 by stating, “The organized medical staff is responsible for planning and implementing a privileging process.” It goes on to state that this process typically includes:

- Developing and approving a procedures list
- Processing the application
- Evaluating applicant-specific information
- Submitting recommendations to the governing body for applicant-specific delineated privileges
- Notifying the applicant, relevant personnel, and, as required by law, external entities of the privileging decision
- Monitoring the use of privileges and quality-of-care issues

MS.06.01.05 further states, “The decision to grant or deny a privilege(s) and/or to renew an existing privilege(s) is an objective, evidence-based process.”

The EPs for standard MS.06.01.05 include several requirements as follows:

- The need for all licensed independent practitioners who provide care, treatment, and services to have a current license, certification, or registration, as required by law and regulation
- Established criteria as recommended by the organized medical staff and approved by the governing body with specific evaluation of current licensure and/or certification, specific relevant training, evidence of physical ability, professional practice review data from the applicant’s current organization, peer and/or faculty recommendation, and a review of the practitioner’s performance within the hospital (for renewal of privileges)
- Consistent application of criteria
- A clearly defined (documented) procedure for processing clinical privilege requests that is approved by the organized medical staff
- Documentation and confirmation of the applicant’s statement that no health problems exist that would affect his or her ability to perform privileges requested
- A query of the NPDB for initial privileges, renewal of privileges, and when a new privilege is requested
• Written peer recommendations that address the practitioner’s current medical/clinical knowledge, technical and clinical skills, clinical judgment, interpersonal skills, communication skills, and professionalism
• A list of specific challenges or concerns that the organized medical staff must evaluate prior to recommending privileges (MS.06.01.05, EP 9)
• A process to determine whether there is sufficient clinical performance information to make a decision related to privileges
• A decision (action) on the completed application for privileges that occurs within the time period specified in the organization’s medical staff bylaws
• Information regarding any changes to practitioners’ clinical privileges, updated as they occur

The Joint Commission further states, “The organized medical staff reviews and analyzes information regarding each requesting practitioner’s current licensure status, training, experience, current competence, and ability to perform the requested privilege” (MS.06.01.07).

In the EPs for standard MS.06.01.07, The Joint Commission states that the information review and analysis process is clearly defined and that the decision process must be timely. The organization, based on recommendations by the organized medical staff and approval by the governing body, develops criteria that will be considered in the decision to grant, limit, or deny a request for privileges. The criteria must be consistently applied and directly relate to the quality of care, treatment, and services. Ultimately, the governing body or delegated governing body has the final authority for granting, renewing, or denying clinical privileges. Privileges may not be granted for a period beyond two years.

Criteria that determine a practitioner’s ability to provide patient care, treatment, and services within the scope of the privilege(s) requested are consistently evaluated.

The Joint Commission further states, “Ongoing professional practice evaluation information is factored into the decision to maintain existing privilege(s), to revise existing privileges, or to revoke an existing privilege prior to or at the time of renewal” (MS.08.01.03).

In the EPs for MS.08.01.03, The Joint Commission says there is a clearly defined process facilitating the evaluation of each practitioner’s professional practice, in which the type of information collected is determined by individual departments and approved by the organized medical staff. Information resulting from the ongoing professional practice evaluation is used to determine whether to continue, limit, or revoke any existing privilege.

HFAP

The Healthcare Facilities Accreditation Program (HFAP) has no formal position concerning the delineation of privileges for nuclear radiology. The bylaws must
include the criteria for determining the privileges to be granted to the individual practitioners and the procedure for applying the criteria to individuals requesting privileges (03.01.09). Privileges are granted based on the medical staff’s review of an individual practitioner’s qualifications and its recommendation regarding that individual practitioner to the governing body.

It is also required that the organization have a process to ensure that practitioners granted privileges are working within the scope of those privileges. Privileges must be granted within the capabilities of the facility. For example, if an organization is not capable of performing open-heart surgery, no physician should be granted that privilege.

In the explanation for standard 03.01.13 related to membership selection criteria, HFAP states, “Basic criteria listed in the bylaws, or the credentials manual, include the items listed in this standard. (Emphasis is placed on training and competence in the requested privileges.)”

The bylaws also define the mechanisms by which the clinical departments, if applicable, or the medical staff as a whole establish criteria for specific privilege delineation.

Periodic appraisals of the suitability for membership and clinical privileges is required to determine whether the individual practitioner’s clinical privileges should be approved, continued, discontinued, revised, or otherwise changed (03.00.04). The appraisals are to be conducted at least every 24 months.

The medical staff is accountable to the governing body for the quality of medical care provided, and quality assessment and performance improvement (03.02.01) information must be used in the process of evaluating and acting on re-privileging and reappointment requests from members and other credentialed staff.

**DNV**

DNV has no formal position concerning the delineation of privileges for nuclear radiology. MS.12 Standard Requirement (SR) #1 states, “The medical staff bylaws shall include criteria for determining the privileges to be granted to individual practitioners and a procedure for applying the criteria to those individuals that request privileges.”

The governing body shall ensure that under no circumstances is medical staff membership or professional privileges in the organization dependent solely upon certification, fellowship, or membership in a specialty body or society.

Regarding the Medical Staff Standards related to Clinical Privileges (MS.12), DNV requires specific provisions within the medical staff bylaws for:
• The consideration of automatic suspension of clinical privileges in the following circumstances: revocation/restriction of licensure; revocation, suspension, or probation of a DEA license; failure to maintain professional liability insurance as specified; and noncompliance with written medical record delinquency/deficiency requirements
• Immediate and automatic suspension of clinical privileges due to the termination or revocation of the practitioner’s Medicare/Medicaid status
• Fair hearing and appeal

The Interpretive Guidelines also state that core privileges for general surgery and surgical subspecialties are acceptable as long as the core is properly defined.

DNV also requires a mechanism (outlined in the bylaws) to ensure that all individuals provide services only within the scope of privileges granted (MS.12, SR.4).

Clinical privileges (and appointments or reappointments) are for a period as defined by state law or, if permitted by state law, not to exceed three years (MS.12, SR.2).

Individual practitioner performance data must be measured, utilized, and evaluated as a part of the decision-making for appointment and reappointment. Although not specifically stated, this would apply to the individual practitioner’s respective delineation of privilege requests.

## CRC draft criteria

The following draft criteria are intended to serve solely as a starting point for the development of an institution’s policy regarding this practice area. The core privileges and accompanying procedure list are not meant to be all-encompassing. They define the types of activities, procedures, and privileges that the majority of practitioners in this subspecialty. Additionally, practitioners cannot be expected or required to perform every procedure listed. Instruct practitioners that they may strikethrough or delete any procedures they do not wish to request.

## Minimum threshold criteria for requesting privileges in nuclear radiology

**Basic education:** MD

**Minimal formal training:** To be eligible to apply for privileges in nuclear radiology, the applicant must demonstrate successful completion of an ACGME- or RCPSC-accredited residency in diagnostic radiology resulting in certification by the ABR, followed by successful completion of an ACGME- or RCPSC-accredited fellowship in nuclear radiology resulting in subspecialty certification by the ABR.

**Required current experience:** Applicants must demonstrate completion of at least
[n] nuclear radiology procedures, reflective of the scope of privileges requested, in the past 12 months or successful completion of an ACGME- or AOA-accredited residency or clinical fellowship within the past 12 months.

**References**

If the applicant is recently trained, a letter of reference should come from the director of the applicant’s training program. Alternatively, a letter of reference may come from the applicable department chair and/or clinical service chief at the facility where the applicant most recently practiced.

**Core privileges in nuclear radiology**

Core privileges for nuclear radiology include the ability to use radiopharmaceuticals and hybrid technology to diagnose, treat, and monitor adult and pediatric patients with a spectrum of benign and malignant diseases. Core privileges also include the ability to assess, stabilize, and determine the disposition of patients with emergent conditions consistent with medical staff policy regarding emergency and consultative call services.

The core privileges in this subspecialty include the following procedures:

- Performance of history and physical exam
- Dynamic and static imaging of pathophysiologic processes
- Performance and interpretation of the results of diagnostic examinations of patients using radiopharmaceuticals, including:
  - Perfusion imaging procedures
  - Octreotide and other receptor-based imaging
  - PET/CT imaging
- Performance and interpretation of the results of cardiac imaging, including:
  - Myocardial perfusion imaging procedures performed with radioactive perfusion agents in association with treadmill and pharmacologic stress testing (planar and tomographic, including gated tomographic imaging)
  - Radionuclide ventriculography performed with ECG gating for evaluation of ventricular performance
- Performance and interpretation of the results of endocrinologic imaging, including thyroid and parathyroid imaging
- Performance and interpretation of the results of imaging of the salivary glands, esophagus, stomach, and liver, both reticuloendothelial function and the biliary system, including gastrointestinal bleeding and Meckel’s diverticulum
- Performance and interpretation of the results of renal perfusion and function procedures, renal scintigraphy with pharmacologic interventions, renal transplant evaluation, and vesicoureteral reflux
- Performance and interpretation of the results of bone scanning for benign and malignant disease
- Performance and interpretation of the results of cerebral perfusion with both SPECT and/or PET, cisternography, and CSF flow studies
• PET imaging, including:
  - The brain, to include studies of dementia, epilepsy, and brain tumors
  - Myocardial perfusion studies
  - Oncology, including tumors of the lung, head and neck, esophagus, colon, thyroid, and breast, as well as melanoma, lymphoma, and other tumors as indications become established
• Oncology studies, including sentinel node localization, FDG, adrenal, somatostatin-receptor imaging, and other agents as they become available
• Pulmonary studies of perfusion and ventilation performed with radiolabeled macroaggregates and radioactive gas or aerosols, for both diagnostic and quantitative assessment of perfusion and ventilation
• Oral administration of sodium iodide I 131, for which a written directive is required
• 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

**Special noncore privileges in nuclear radiology**

If desired, noncore privileges are requested individually in addition to requesting the core. Each individual requesting noncore privileges must meet the specific threshold criteria governing the exercise of the privilege requested, including training, required previous experience, and maintenance of clinical competence.

**Reappointment**

Reappointment should be based on unbiased, objective results of care according to a hospital’s quality assurance mechanism. To be eligible to renew privileges in nuclear radiology, the applicant must have current demonstrated competence and an adequate volume of experience ([n] patients) with acceptable results, reflective of the scope of privileges requested, for the past [n] months based on results of ongoing professional practice evaluation and outcomes. Evidence of current physical and mental ability to perform privileges requested is required of all applicants for renewal of privileges. In addition, continuing education related to nuclear radiology should be required.
For more information

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American Board of Radiology
5441 East Williams Circle
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Website: www.theabr.org

American College of Radiology
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Website: www.acr.org

American Osteopathic Association
142 East Ontario Street
Chicago, IL 60611
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Fax: 312-202-8200
Website: www.osteopathic.org

Centers for Medicare & Medicaid Services
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Telephone: 877-267-2323
Website: www.cms.hhs.gov

DNV Healthcare, Inc.
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Healthcare Facilities Accreditation Program
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