

MRI Accreditation Program Requirements



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Revisions

Date	Page Number	Description of Revisions
5/05/16	7	Added Osteopathic Continuous Certification (OCC) for AOBR to Physician Requirements
6/23/16	11	Added Maintenance of Certification for Medical Physics to physicist qualifications
5-28-17	4	Added new unit addendum and new unit reinstate cycle clarification language
5-28-17	14	Updated exam selections and removed speciality exam requirements
5-28-17	15	Updated exam requirements per module selection and removed speciality exam requirements
5-28-17	17-18	Updated links to accreditation webpage and practice parameters and technical standards
12-28-17	3	Clarified that each unit must pass ACR accreditation testing for facility compliance

Overview

The MRI Accreditation Program evaluates the qualifications of personnel, the quality control program, MR Safety Policies and image quality specific to MRI. It involves the acquisition of clinical and phantom images and corresponding data for each unit. The acquisition of the phantom images involves the use of a designated MRI phantom appropriate to the unit or module listed on the application. Every unit used to produce diagnostic clinical images for patients must successfully pass ACR accreditation testing for the facility to be accredited. Facilities that use units that have been withdrawn, expired, or failed accreditation testing or facilities that never submit a unit for accreditation testing are subject to revocation of their accreditation. Such revocation could adversely affect reimbursement.

Since the origin of the ACR MRI Accreditation Program, patterns of practice and use of units have evolved. In the 1990s, most units were used for general MRI so the mandate for brain, cervical spine, lumbar spine and knee examination from all units was reasonable. In recent years, units are frequently used for limited anatomic applications such as head or spine only. In addition, single application specialty units have been developed.

In response to this change in practice patterns, the ACR has modified the MRI Accreditation Program to offer modules based on these anatomic applications. The ACR offers the following modules:

- Head
- Spine
- Musculoskeletal (MSK)
- Body
- Magnetic Resonance Angiography (MRA)
- Cardiac

(See section on Accreditation Testing; page 15 for specific examinations per module.)

Every unit must apply for all modules routinely performed on that unit for a facility to be accredited.

Medicare Improvement for Patients and Providers Act of 2008 (MIPPA)

It is important to note that under the Medicare Improvement for Patients and Providers Act of 2008 (MIPPA), all facilities that bill for advanced diagnostic imaging services, such as breast MRI, under technical component of part B of the Medicare Physician Fee Schedule must be accredited by a CMS designated accrediting organization by January 1, 2012 to qualify for Medicare reimbursement. This rule affects providers of MRI, CT, PET and nuclear medicine imaging services for Medicare beneficiaries on an outpatient basis.

For accredited facilities that receive reimbursement from Medicare for the technical component of imaging examinations under the Fee Schedule there are additional mandatory requirements. As with all accreditation requirements verification of compliance with these requirements will take place during any on site survey by the ACR or CMS.

1. Each facility must have a process in place for all patients to obtain copies of their records and images that is HIPAA compliant. Patients should be made aware of this process at the time of examination or if requested by the patient at a later date.
2. Each facility must have a procedure for documenting the qualifications of the facility’s personnel from the primary source when appropriate for licenses and certifications. Facilities must also verify that personnel are not included on the Office of Inspector General’s (OIG) exclusion list at <http://oig.hhs.gov/fraud/exclusions.asp>.
3. All facilities must make publically available a notification for patients, family members or consumers that they may file a written complaint with the ACR.

While these procedures are mandatory only for facilities that receive reimbursement from Medicare for the technical component of imaging examinations under the Fee Schedule, the ACR encourages all facilities to implement such procedures.

Mandatory Accreditation Time Requirements

Submission of all accreditation materials is subject to mandatory timelines. Detailed information about specific time requirements is located in the *Overview for the Diagnostic Modality Accreditation Program*. Please read and be familiar with these requirements.

Table 1. Required Materials Due Dates	
Materials Required	Due
Renewal application	60 calendar days from date sent
Testing materials	45 calendar days from date sent
Repeat Option forms (after deficiency)	15 calendar days from date sent

Withdrawn, Added, or Replacement Units

The MRI Accreditation Program is unit based. Consequently, facilities ***must notify the ACR*** if they have permanently ***withdrawn*** (i.e., removed) a unit from service, if they have ***replaced*** that unit with a new one or have ***added*** another unit. The type of accreditation options available for a new unit will depend on the amount of ***time the facility has left on its current accreditation certificate***:

- ***Over 13 months*** – The facility needs to submit only unit information and additional testing materials. Once accreditation is approved, the new unit’s expiration date will be the same as the previous expiration date.
 - ***New Unit Addendum***- A facility with other fully accredited units may choose to complete a New Unit Addendum and pay a ***reduced fee*** for accrediting the new unit (since it will not receive a full, 3-year accreditation). A facility with a new unit(s) applying mid-cycle in this manner need submit only testing for the new unit. Once accreditation is approved for the new unit, ***its expirations date will be the same as the other units*** at the facility.

- ***New Unit Reinstatement***-The facility may choose to submit a New Unit Reinstatement Application. The facility will apply for and submit images for all active units. This includes both existing and new units. The full application fee applies for all units. Once approved, the facility will receive a new ***3-year accreditation from the date of approval.***
- ***Less than 13 months*** - The facility must renew accreditation for all units at the facility including the new one. Once approved, all of the units at the facility will have an expiration date that is three years from the old expiration date.

If the unit replaces an existing MRI unit after accreditation is granted, it will be treated as a new unit and follow the procedures above. If the unit begins performing examinations from a module that was not included on the original application, at least one examination from that module must be submitted. If less than thirteen months are left on the facility's accreditation, it must renew the accreditation of all of its equipment at the same time.

Loaner unit

Accredited facilities may use a "loaner" unit to temporarily replace an accredited unit that is out of service for repairs, etc. for up to six months without submitting clinical and phantom images for evaluation. The accredited facility must immediately notify the ACR of the installation date, manufacturer and model of the loaner. Any loaner unit that is in use for more than one month will be required to submit evidence of testing by a qualified medical physicist/MR scientist within 90 days of installation. If the loaner is in place for longer than six months, the facility must submit the unit for accreditation evaluation, including clinical and phantom image assessment and the corresponding fee.

Emergency Use of Units

Facilities may use units that are not accredited in specific modules for other types of MR imaging in emergency cases without jeopardizing a facility's accreditation status. An emergency situation would be one in which less than 10 examinations are performed outside a unit's accreditation status in any 30 day period, or less than 50 examinations in any 12 month period. If the volume of examinations exceeds these limits, the facility must notify the ACR and submit testing for this module.

Personnel Qualifications

All interpreting physicians, medical physicists and technologists working in MRI (including part-time and locum tenens staff) **must meet and document** specific requirements in order for their facility to be accredited by the ACR.

The continuing education and continuing experience requirements are based on previous full calendar years. For example, if a site renews their accreditation in July 2014, the physicians and medical physicists/MR scientists at that site must have met the full requirement for continuing education from January 1, 2011 to December 31, 2013. Likewise, they must have met the full continuing experience requirements from January 1, 2011 to December 31, 2013. If they did not meet these requirements in the given timeframes, the ACR will accept continuing education credits or continuing experience obtained in 2014.

Physician

The physician shall have the responsibility for all aspects of the study including, but not limited to, reviewing all indications for the examination, specifying the pulse sequences to be performed, specifying the use and dosage of contrast agents, interpreting images, generating written reports, and assuring the quality of both the images and interpretations.

Requirements for Physicians Supervising and Interpreting MRI Examinations		
Qualifications	Radiologists	Other Physician
Initial	<ul style="list-style-type: none"> • Board certification in radiology or diagnostic radiology by: <ul style="list-style-type: none"> ○ ABR, ○ American Osteopathic Board of Radiology, ○ Royal College of Physicians and Surgeons of Canada, or ○ Le College des Mediciens du Quebec, and ○ For Radiologists graduating from Residency after June 30, 2014, board certified or board eligible as defined by the American Board of Radiology <li style="text-align: center;">AND • If board certified before 1995, must also meet the following: <ul style="list-style-type: none"> ○ Supervision, interpretation and/or review and reporting of 300 MRI examinations within the last 36 months.^{1, 2} <li style="text-align: center;">OR (Not Board Certified) • Completion of an accredited diagnostic radiology residency program, and • Interpretation and reporting of 500 MRI examinations in the past 36 months. <p style="text-align: center;">Occasional Readers</p> <p>Occasional readers who are providing imaging services to and for the practice are not required to meet the interpreting physician initial qualifications or continuing experience</p>	<p>(MR imaging limited to a specific anatomic area)</p> <ul style="list-style-type: none"> • Completion of an accredited specialty residency, and • 200 hours of Category I Continuing Medical Education (CME) in MRI to include, but not limited to: MRI physics, recognition of MRI artifacts, safety, instrumentation, and clinical applications of MRI in the subspecialty area where MRI reading occurs, and • 500 MRI cases in that specialty area shall have been interpreted and reported in the past 36 months in a supervised situation. For neurologic MRI, at least 50 of the 500 cases shall have been MRA or the central nervous system.²

¹ Board certification and completion of an accredited radiology residency in the past 24 months will be presumed to be satisfactory experience for the reporting and interpreting requirement.

² The supervising interpreting physician reviews, discusses, and confirms the diagnosis of the physician being supervised. The supervising interpreting physician does not have to be present at the time of initial interpretation. However, the supervising physician must review and, if necessary, correct the final interpretation. Supervision may also be accomplished through a formal course that includes a lecture format in addition to all of the following: 1) a database of previously performed and interpreted cases, 2) an assessment system traceable to the individual participant, and 3) direct feedback regarding the responses. Examples of suitable assessment systems are an audience response system, a viewbox or monitor based program or an individual CD-ROM or web-based instruction system.

	<p>requirements. However, the reads of all occasional readers combined should not exceed 5% of the total volume of reads per practice and per modality. There must be an active written review process in place at the institution for occasional readers based on each institution's credentialing requirements. Validation of this process will take place during any site visit by the ACR.</p>	
Continuing Experience	<p>Upon renewal, physicians reading MRI examinations must meet the following: Currently meets the Maintenance of Certification (MOC) requirements for ABR (See ABR MOC) or the Osteopathic Continuous Certification (OCC) for AOBR (See AOBR OCC) OR Physicians reading MRI examinations across multiple organ systems must have read 200 exams over the prior 36 months.³ OR For physicians reading organ system specific exams (i.e., body, abdominal, musculoskeletal, head) across multiple modalities they must read a minimum of 60 organ system specific MRI exams in 36 months. However, they must read a total of 200 <i>cross-sectional imaging</i> (MRI, CT, PET/CT and ultrasound) studies over the prior 36 months.³</p>	
Continuing Education	<p>Upon renewal must meet one of the following: 1. Currently meets the Maintenance of Certification (MOC) requirements for ABR (See ABR MOC) or the Osteopathic Continuous Certification (OCC) for AOBR (See AOBR OCC) OR 2. Completes 150 hours (that includes 75 hours of Category 1 CME) in the prior 36 months pertinent to the physician's practice patterns (See ACR Parameter) OR 3. Completes 15 hours CME in the prior 36 months specific to the imaging modality or organ system (half of which must be category 1)</p>	

All physicians who supervise and/or interpret MRI examinations must be a licensed medical practitioner who meets the following minimum criteria:

³ Double-reading (2 or more physicians interpreting the same examination) is acceptable. Interpreting physicians may also re-interpret a previously interpreted examination and count it towards meeting the continuing experience requirement, as long as he/she did not do the initial interpretation. Examinations that are reviewed and evaluated for RADPEER™ or an alternative physician peer review program may count toward your continuing experience numbers.

Requirements for Physicians Supervising and Interpreting Cardiac MRI Examinations		
Qualifications	Radiologists	Other Physicians
Initial	<ul style="list-style-type: none"> Board certification in radiology or diagnostic radiology by: <ul style="list-style-type: none"> ABR, American Osteopathic Board of Radiology, Royal College of Physicians and Surgeons of Canada, or Le College des Mediciens du Quebec For Radiologist graduating from Residency after June 30, 2014, board certified or board eligible as defined by the American Board of Radiology. <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> If board certified before 2008, must also meet the following: <ul style="list-style-type: none"> Supervision, interpretation and/or review and reporting of 75 Cardiac MRI examinations within the last 36 months.^{4, 5} <p style="text-align: center;">OR (Not board certified)</p> <ul style="list-style-type: none"> Completion of an Accreditation Council for Graduate Medical Education (ACGME) Radiology Residency Program, AND Have supervised interpretation of 75 cardiac MRI cases in the past 36 months⁵ <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> Completion of at least 40 hours of Category 1 Continuing Medical Education (CME) in cardiac imaging, including cardiac MRI, anatomy, physiology, and/or pathology or documented equivalent supervised experience in a center actively performing cardiac MRI.⁵ 	<p style="text-align: center;">CARDIOLOGISTS⁶ (Cardiac Only)</p> <p>Certification in cardiology by the American Board of Internal Medicine with completion of Level 2 training or higher</p> <p>Level 2 requirements</p> <ul style="list-style-type: none"> Board certification or eligibility, valid medical license, and completion of a 3-month (cumulative) specialty residency or fellowship in CMR <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> 150 CMR examinations in which 50 where the candidate is physically present, involved in the acquisition and interpretation of the case, <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> Completion of 30 hours of courses related to MR in general and/or CMR in particular <p>Level 3 requirements</p> <ul style="list-style-type: none"> Board certification or eligibility, valid medical license, and completion of a 12-month (cumulative) specialty residency or fellowship in CMR <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> 300 CMR examination in which 100 where the candidate is physically present, involved in the acquisition and interpretation of the case, <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> Completion of 60 hours of courses related to MR in general and/or CMR in particular <p style="text-align: center;">NUCLEAR MEDICINE PHYSICIANS (Cardiac Only)</p> <ul style="list-style-type: none"> Completion of an ACGME approved training program in nuclear medicine <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> Specific training in MRI within an ACGME accredited training program <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> 160 hours of category 1 CME in MRI to include, but not limited to: MRI physics, recognition of artifacts, safety, instrumentation, and 40 hours specific to cardiovascular MRI. <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> Interpretation and reporting under the supervision of a qualified physician of at least 75 cases of MRI of the cardiovascular system during the past 36 months.⁵
Continuing Experience	Upon renewal, radiologists reading Cardiac MRI examinations must have read 50 exams over the prior 24-month period. The cardiac examinations interpreted will count toward the overall continuing experience for other MR modules. ⁷	Upon renewal, cardiologists reading Cardiac MRI examinations must have continuing experience in accordance with level 2 requirements or higher – 50 examinations each year. ⁷
Continuing Education	Upon renewal, physicians must have earned at least 15 CME in MRI (half of which must be category 1) hours in the prior 36-month period and should include CME in Cardiac MRI as is appropriate to the physician's	Upon renewal, cardiologists must have earned at least 30 hours of coursework in the prior 36 month period in accordance with level 2 requirements.

⁴ Board certification and completion of an accredited radiology residency in the past 24 months will be presumed to be satisfactory experience for the reporting and interpreting requirement.

⁵ The supervising interpreting physician reviews, discusses, and confirms the diagnosis of the physician being supervised. The supervising interpreting physician does not have to be present at the time of initial interpretation. However, the supervising physician must review and, if necessary, correct the final interpretation. Supervision may also be accomplished through a formal course that includes a lecture format in addition to all of the following: 1) a database of previously performed and interpreted cases, 2) an assessment system traceable to the individual participant, and 3) direct feedback regarding the responses. Examples of suitable assessment systems are an audience response system, a viewbox or monitor based program or an individual CD-ROM or web-based instruction system.

⁶ 2005 ACCF/AHA Clinical Competence Statement on Cardiac CT and MR.

⁷ Double-reading (2 or more physicians interpreting the same examination) is acceptable. Interpreting physicians may also re-interpret a previously interpreted examination and count it towards meeting the continuing experience requirement, as long as he/she did not do the initial interpretation. Examinations that are reviewed and evaluated for RADPEER™ or an alternative physician peer review program may count toward your continuing experience numbers.

	practice needs.	
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In addition to being in compliance with the interpreting physician qualifications stated above, the *supervising physician* also has the following responsibilities:

- Develop, implement and enforce policies and procedures in compliance with the ACR White Paper on Magnetic Resonance (MR) Safety.
- Develop, implement and enforce policies and procedures to address safety issues, including contrast use and sedation, for pediatric patients.
- Ensure that a physician is present and immediately available when contrast is administered to patients.
- Develop, implement and enforce policies and procedures to identify pregnant or potentially pregnant patients.
- Develop, implement and enforce policies and procedures consistent with ACR's Position Statement on Quality Control and Improvement, Safety, Infection Control, and Patient Education.
- Be responsible for assuring compliance with the recommendations of the medical physicist.
- Be responsible for the oversight and submission of all materials, including clinical and phantom images, as appropriate, quality control data and such other information as required by the MRI Accreditation Program.
- Be responsible for notifying the ACR within 15 days of any changes in imaging equipment (units) or changes in the use of equipment that could affect clinical or phantom images (i.e., in MR starting to use the magnet for a module that is not accredited).
- Ensure that all accreditation criteria are met and that the same standard of performance is maintained during the 3-year accreditation period.
- Provide immediate written notice to the ACR upon the termination of any accredited services provided by the Practice Site or a change in ownership of the operating location.
- Ensure that all physicians providing services at this facility are actively participating in a formal peer review program that meets the stated accreditation requirements.

Technologist

All technologists performing MRI examinations **must** meet the minimum criteria in the table below. The ACR **recommends** that technologists be certified and actively registered in the modality they perform. In addition, the ACR **recommends** that technologists performing cardiac MRI hold the Current Basic Life Support certification and be capable of using an automatic external defibrillator.

Qualifications	Technologist
Initial	<ul style="list-style-type: none"> • ARRT, ARMRT or CAMRT registered as an MR technologist OR • ARRT registered or unlimited state license, and • 6 months supervised MRI clinical scanning experience OR • Associate degree or bachelor degree in allied health field, and • Certification in another clinical imaging field (such as ARDMS or NMTCB), and • 6 months supervised MRI clinical scanning experience OR • Performing MRI prior to and continuously since October 1996, and • Evaluated by responsible physician to assure competence <p style="text-align: center;">For Cardiac Module</p> <ul style="list-style-type: none"> • ARRT, ARMRT or CAMRT registered as an MR technologist OR • ARRT registered and unlimited state license, and • 6 months supervised MRI clinical scanning experience AND (all technologists) • Cardiac MRI experience supervised by a qualified physician or a qualified technologist(required) • Experience in the intravenous administration of conventional MR contrast, supervised by a qualified physician or a qualified technologist. (required) • Maintain Basic Life Support (BLS) certification (recommended) • Be capable of using an automatic external defibrillator (AED).(recommended) <p><i>Technologists practicing MRI scanning should be licensed in the jurisdiction in which he/she practices, if state licensure for MRI technologists exists.</i></p>
Continuing Education	<ul style="list-style-type: none"> • Registered technologists <ul style="list-style-type: none"> – In compliance with the CE requirements of their certifying organization for the imaging modality in which they perform services – CE includes credits pertinent to the technologist’s ACR accredited clinical practice • State licensed technologists <ul style="list-style-type: none"> – 24 hours of CE every 2 years – CE is relevant to imaging and the radiologic sciences, patient care – CE includes credits pertinent to the technologist’s ACR accredited clinical practice • All others <ul style="list-style-type: none"> – 24 hours of CE every 2 years – CE is relevant to imaging and the radiologic sciences, patient care – CE includes credits pertinent to the technologist’s ACR accredited clinical practice

Medical Physicist/MR Scientist

The medical physicist/MR scientist:

- Must be familiar with the principles of MRI safety for patients, personnel, and the public; the Food and Drug Administration's guidance for MR diagnostic devices; and other regulations pertaining to the performance of the equipment being monitored.
- Must be knowledgeable in the field of nuclear MR physics and familiar with MRI technology, including function, clinical uses, and performance specifications of MRI equipment, as well as calibration processes and limitations of the performance testing hardware, procedures, and algorithms.
- Must have a working understanding of clinical imaging protocols and methods of their optimization. This proficiency should be maintained by participation in continuing education programs of sufficient frequency to ensure familiarity with current concepts, equipment, and procedures.

The qualified medical physicist/MR scientist is responsible for the conduct of all surveys of the MRI equipment. The medical physicist/MR scientist may be *assisted* by properly trained individuals in obtaining data. These individuals must be approved by the medical physicist/MR scientist in the techniques of performing tests, the function and limitations of the imaging equipment and test instruments, the reasons for the tests, and the importance of the test results. The medical physicist/MR scientist *must be present* during the surveys; review, interpret, and approve all data; and provide a report of the conclusions *with his/her signature*. Effective **January 1, 2010**, all medical physicists/MR scientists providing these services *must* meet the following minimum criteria:

Qualifications	Medical Physicist	MR Scientist
Initial	<p style="text-align: center;"><u>Board Certified</u></p> <p>Certified in Diagnostic Radiological Physics or Radiological Physics by the American Board of Radiology; in Diagnostic Imaging Physics or Magnetic Resonance Imaging Physics by the American Board of Medical Physics; or in Diagnostic Radiology Physics or Magnetic Resonance Imaging Physics by the Canadian College of Physicists in Medicine</p> <p style="text-align: center;">OR</p> <p style="text-align: center;"><u>Not Board Certified in Required Subspecialty</u></p> <ul style="list-style-type: none"> • Graduate degree in medical physics, radiologic physics, physics, or other relevant physical science or engineering discipline from an accredited institution, and • Formal coursework in the biological sciences with at least <ul style="list-style-type: none"> - 1 course in biology or radiation biology, and - 1 course in anatomy, physiology, or similar topics related to the practice of medical physics • 3 years of documented experience in a clinical setting <p style="text-align: center;">OR</p> <p style="text-align: center;"><u>Grandfathered</u></p> <p>Conducted surveys of at least 3 MRI units between January 1, 2007 and January 1, 2010</p>	<ul style="list-style-type: none"> • Graduate degree in a physical science involving nuclear MR (NMR) or MRI • 3 years of documented experience in a clinical MRI environment
Continuing Experience	Upon renewal, 2 MRI unit surveys in prior 24 months	
Continuing Education	Upon renewal, must meet one of the following: 1. Currently meet the Maintenance of Certification (MOC) requirements for ABR (see ABR MOC for Medical Physics) or the ABMP (see the ABMP Information Booklet)	

OR

Completes **15 CEU/CME** (1/2 Cat 1) in the prior **36 months** (must include credits pertinent to the accredited modality)

Equipment

The MR equipment specifications and performance shall meet all state and federal requirements. The requirements include, but are not limited to, specifications of maximum static magnetic field strength, maximum rate of change of magnetic field strength (dB/dt), maximum radiofrequency power deposition (specific absorption rate), and maximum auditory noise levels.

Quality Control

Acceptance Testing

Acceptance testing is intended to measure quantifiable system parameters, which may then be compared to the manufacturer's specifications. A complete evaluation of the system performance should be performed by a qualified medical physicist/MR scientist after completion of installation and prior to patient imaging.⁸

Quality Control Testing

All facilities applying for accreditation must maintain a documented quality control (QC) program and must comply with the minimum frequencies of testing outlined below. Detailed instructions for each of the QC tests listed below are contained in the *2015 ACR MRI Quality Control Manual*. Upon acceptance of a facility's initial application, the manual will be sent to the MRI supervising physician at the practice site address under separate cover.

The ongoing QC program assesses relative changes in system performance as determined by the technologist, service engineer, qualified medical physicist/MR scientist, or supervising physician. A qualified medical physicist/MR scientist **must** have the responsibility for overseeing the equipment quality control program and for monitoring performance upon installation and routinely thereafter. All facilities applying for accreditation or renewal must demonstrate compliance with the ACR requirements for quality control (QC) by including a copy of the facility's most recent **Annual MRI System Performance Evaluation Summary (must be performed and signed by a medical physicist/MR scientist and must include evaluation of the technologist QC and MR Safety Program Assessment)**. ACR realizes that surveys cannot usually be scheduled exactly on the anniversary date of the previous survey. Therefore a period of up to 14 months between surveys is acceptable. If the facility has been conducting QC for less than one quarter, the facility will submit whatever they have on these forms. Additionally, if the **Annual MRI System Performance Evaluation** and/or QC files show performance deficits (e.g. problems with the system and/or data outside of the action limits), the facility must state what steps it has taken to correct the problems. All QC testing must be carried out in

⁸ A suggested protocol for acceptance testing is contained in "Acceptance Testing of Magnetic Resonance Imaging Systems: Report of American Association of Physicists in Medicine (AAPM) Nuclear Magnetic Resonance Task Group No. 6, Medical Physics. 1992; 19:217-219. This document is meant only to serve as a reference. The substance of this document is not intended to be incorporated by reference into the ACR Practice Guideline for Performing and Interpreting Magnetic Resonance Imaging (MRI).

accordance with the written procedures and methods outlined in the *ACR 2015 MRI Quality Control Manual* by July 1, 2016.

Continuous Quality Control

The following is a list of QC tests and frequencies that must be performed by technologists and medical physicists/MR scientists:

Technologist's Weekly QC Tests		Physicist/MR Scientist's Annual QC Tests
<ul style="list-style-type: none"> • Setup and Table Position Accuracy • Center Frequency • Transmitter Gain or Attenuation • Geometric Accuracy • High-Contrast Spatial Resolution 	<ul style="list-style-type: none"> • Low-Contrast Detectability • Artifact Evaluation • Film Printer Quality Control (if applicable) • Visual Checklist 	<ul style="list-style-type: none"> • Magnetic Field Homogeneity • Slice Position Accuracy • Slice Thickness Accuracy • Radiofrequency Coil Checks • Soft-Copy (Monitor) Quality Control • MR Safety Program Assessment • Evaluation of Technologist Weekly QC

Preventive Maintenance

Preventive maintenance shall be scheduled, performed and documented by a qualified service engineer on a regular basis. Service performed to correct system deficiencies shall also be documented and service records maintained by the MR site.

Quality Assurance

Physician Peer-Review Requirements

Examinations should be systematically reviewed and evaluated as part of the overall quality improvement program at the facility⁹. Monitoring should include evaluation of the accuracy of interpretation as well as the appropriateness of the examination. Complications and adverse events or activities that may have the potential for sentinel events must be monitored, analyzed and reported as required, and periodically reviewed in order to identify opportunities to improve patient care. These data should be collected in a manner that complies with statutory and regulatory peer-review procedures in order to ensure the confidentiality of the peer-review process.

All sites initially applying for ACR accreditation and all sites renewing their accreditation must actively participate in a physician peer review program. There are several options available to meet this requirement. Sites may develop their own peer review program, use a vendor product or RADPEER, a peer review process developed by the ACR.

Sites not using RADPEER must use a program that performs the follows functions:

- Includes a double reading (2 MDs interpreting the same study) assessment.
- Allows for random selection of studies to be reviewed on a regularly scheduled basis.
- Exams and procedures representative of the actual clinical practice of each physician.

⁹ 2005 ACR Practice Parameters and Technical Standards. ACR Position Statement on Quality Control and Improvement, Safety, Infection Control, and Patient Education Concerns. Page IV.

- Reviewer assessment of the agreement of the original report with subsequent review (or with surgical or pathological findings).
- A classification of peer review findings with regard to level of quality concerns (One example is a 4-point scoring scale).
- Policies and procedures for action to be taken on significant discrepant peer review findings for the purpose of achieving quality outcomes improvement.
- Summary statistics and comparisons generated for each physician by imaging modality.
- Summary data for each facility/practice by modality.

For information about RADPEER please visit the ACR web site at: <http://www.acr.org/Quality-Safety/RADPEER>.

MRI Safety

Safety guidelines, practices, and policies must be written, enforced, reviewed, and documented at least annually by the MR supervising physician. See *ACR Guidance Document on MR Safe Practices: 2013* and the [ACR Manual on Contrast Media](#). The annual medical physicist/MR scientist performance evaluation must also include an assessment of the MRI safety program (signage, access control, screening procedures and cryogen safety) as well as an inspection of the physical and mechanical integrity of the system.

Accreditation Testing

Clinical Images

Between four and six examinations per unit are required for accreditation. The exact number of examinations depends on the number of modules for which the unit is used.

The facility may select which examinations it will submit for accreditation evaluation (see selection list below).

Examination choices for MR Accreditation by module		
Head/Neck	Spine	MSK
<ul style="list-style-type: none"> • Brain for transient ischemic attack (TIA) or stroke • Internal auditory canal (IAC/temporal bone) • Brain for suspected demyelinating disease, encephalitis or acute disseminated encephalomyelitis • Pituitary with contrast enhancement • Orbits for vision loss or tumor 	<ul style="list-style-type: none"> • Lumbar Spine • Thoracic Spine • Cervical Spine • Cervical Spine with contrast for intramedullary disease 	<ul style="list-style-type: none"> • Knee such as for internal derangement • Shoulder such as for internal derangement • Wrist such as for internal derangement • Elbow such as for internal derangement • Forefoot

Body	MRA	Cardiac
<ul style="list-style-type: none"> • Renal • Hepatobiliary to Include MRCP • Female pelvis such as for uterine or adnexal disease • Pediatric pelvis such as for tumor diagnosis or follow-up • Pediatric abdomen with dynamic liver assessment 	<ul style="list-style-type: none"> • Carotid unenhanced • Thoracic aorta • High resolution arch and carotid contrast enhanced • Abdomen for renal artery stenosis or vasculitis 	<ul style="list-style-type: none"> • Delayed enhanced cine with black blood

You must submit localizer or scout sequences with each clinical examination with cross-reference locations for each sequence. Sites cannot submit examinations performed on models or volunteers. All clinical images **must** be from actual patients. **Use of volunteers or models may result in withholding, denial or revocation of accreditation.** The images submitted for each individual exam must be from the same patient (i.e., all brain images must be from the same brain study). The only exception to this is in the event that the facility is only submitting one examination for the cardiac module, in which case it is acceptable to have the black blood sequence from a different patient than the delayed enhanced cine examination.

Facilities are strongly encouraged to submit images by electronic upload. Images submitted by electronic upload or CD **must be** in DICOM format and CD submissions must have an embedded viewer that meets the minimum requirements (see *MR Accreditation Testing Instructions*). The reviewers assume that the images submitted are examples of your best work. All images must demonstrate adequate positioning, resolution, noise, patient and facility identification, and lack of artifacts.

See the table below for the number of examinations required based on the number of modules your site selected on the application:

Number of modules on application	Number of examinations per module	Total exams
One module	Four examinations are required	Four*
Two modules	Select two examinations from each module	Four
Three modules	Select one examination from <i>each</i> module, <i>and</i> select one additional examination from <i>any</i> of the three modules	Four
Four modules	One examination from each module	Four
Five modules	One examination from each module	Five
Six modules	One examination from each module	Six

- If the unit performs and applies for the cardiac module only, a total of two delayed enhanced cine with black blood exams are required

Each set of clinical images will be evaluated for:

- Pulse sequences and image contrast
- Anatomic coverage and imaging planes
- Spatial resolution
- Artifacts
- Exam ID (All patient information annotated on clinical exams will be kept confidential by the ACR.)

Please refer to the *MRI Accreditation Testing Instructions* for specific recommendations and requirements for each examination.

Phantom Testing and Image Quality

Clinical image review and phantom review are intended to complement each other for a comprehensive evaluation of the quality of MRI services. The criteria for evaluation are independent of field strength and can be applied uniformly so that all magnets are measured against a single standard. Depending on the type of scanner, one of two phantoms will be required for the facility to scan and submit images on. The ACR will provide this information in the testing materials for each unit once the application is processed.

Each facility is required to submit phantom images for each unit using the ACR protocols for T1 and T2 weighting *and* phantom images using its own routine T1 and T2 weighted scan protocol.

The images and testing data will be used to assess:

- Limiting high-contrast spatial resolution
- Slice thickness accuracy
- Distance measurement and accuracy
- Signal uniformity
- Image ghosting ratio
- Low-contrast detectability
- Slice positioning accuracy
- Image artifacts

Phantom data must be submitted in the form of uncompressed DICOM images, either uploaded or on a CD-ROM without a viewer.

Accreditation Fees

Checks should be made payable to the American College of Radiology (include modality accreditation ID#, if available). American Express, MasterCard, and Visa are accepted. The charge for the phantom is paid directly to the manufacturer.

Accreditation Fees	
Cycle	Fees
Accreditation (Initial cycle and renewal)	\$2900 for the first unit up to four modules, \$3100 for five modules, \$3300 for six modules \$2800 each additional unit at one site location applying for four modules, \$3000 for five modules, \$3200 for six modules
Repeat	\$1300 per unit for clinical or phantom images. \$2100 per unit if repeating both.
Reinstate/Corrective Action Plan	\$2900 per unit up to four modules, \$3100 for five modules, \$3300 for six modules
Add units (mid cycle)	\$2100 per unit
Add module (mid cycle)	\$2100 per unit
Replacement Certificate	\$50 per certificate
Large Phantom	\$1345 (includes shipping and handling)
Small Phantom	\$1045 (includes shipping and handling)

Note: Fees subject to change without notice.

For Additional Information

For further information visit the ACR Accreditation Web site <http://www.acraccreditation.org/Modalities/MRI> . A link to “Frequently Asked Questions” is available in the MRI menu, along with other useful information about accreditation and many of the program’s forms. To contact the ACR MRI Accreditation Program office by phone, dial (800) 770-0145.

ACR Practice Parameters and Technical Standards

The following ACR Practice Parameters and Technical Standards are pertinent to achieving and maintaining MRI Accreditation. These parameters and standards form the basis of the accreditation program.

[ACR Practice Parameter for Performing and Interpreting Magnetic Resonance Imaging \(MRI\)](#)

[ACR-ASNR-SPR Practice Parameter for the Performance and Interpretation of Magnetic Resonance Imaging \(MRI\) of the Brain](#)

[ACR-ASNR-SNIS-SPR Practice Parameter for the Performance Cerebrovascular Magnetic Resonance Angiography \(MRA\)](#)

[ACR-ASNR-SPR Practice Parameter for the Performance of Magnetic Resonance Imaging \(MRI\) of the Head and Neck](#)

[ACR-ASNR-SCBT-MR Practice Parameter for the Performance of Magnetic Resonance Imaging \(MRI\) of the Adult Spine](#)

[ACR-ASNR-MR-SPR-SSR Practice Parameter for the Performance of Magnetic Resonance Imaging \(MRI\) of the Wrist](#)

[ACR-SPR-SSR Practice Parameter for the Performance and Interpretation of Magnetic Resonance Imaging \(MRI\) of the Shoulder](#)

[ACR-SPR-SSR Practice Parameter for the Performance and Interpretation of Magnetic Resonance Imaging \(MRI\) of the Elbow](#)

[ACR-SPR-SSR Practice Parameter for the Performance and Interpretation of Magnetic Resonance Imaging \(MRI\) of the Hip and Pelvis for Musculoskeletal Disorders](#)

[ACR-SPR-SSR Practice Parameter for the Performance and Interpretation of Magnetic Resonance Imaging \(MRI\) of the Knee](#)

[ACR-NASCI-SPR Practice Parameter for the Performance Body Magnetic Resonance Angiography \(MRA\)](#)

[ACR Practice Parameter for the Performance and Interpretation of Cardiac Magnetic Resonance Imaging \(MRI\)](#)

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[ACR-SAR-SPR Practice Parameter for the Performance of Magnetic Resonance Imaging \(MRI\) of the Liver](#)

[ACR-SAR-SPR Practice Parameter for the Performance of Magnetic Resonance Imaging \(MRI\) of the Abdomen \(excluding the liver\)](#)

[ACR-AAPM Technical Standard for Diagnostic Medical Physics Performance Monitoring of Magnetic Resonance Imaging \(MRI\) Equipment](#)

[ACR Practice Parameter for Communication of Diagnostic Imaging Findings](#)