

CT Accreditation Program Requirements



REVISIONS	2
OVERVIEW	3
MEDICARE IMPROVEMENT FOR PATIENTS AND PROVIDERS ACT OF 2008 (MIPPA).....	3
MANDATORY ACCREDITATION TIME REQUIREMENTS.....	3
WITHDRAWN, ADDED, OR REPLACEMENT UNITS	4
LOANER UNIT	4
PERSONNEL QUALIFICATIONS	5
EQUIPMENT	10
QUALITY CONTROL	10
ANNUAL MEDICAL PHYSICIST SURVEY	10
CONTINUOUS QUALITY CONTROL.....	11
QUALITY ASSURANCE	11
PHYSICIAN PEER-REVIEW REQUIREMENTS	12
ACCREDITATION TESTING	12
CLINICAL IMAGES	12
EXAM IDENTIFICATION AND LABELING	14
CLINICAL PROTOCOLS.....	14
PHANTOM TESTING: IMAGE QUALITY AND DOSE.....	15
ACCREDITATION FEES	16
FOR ADDITIONAL INFORMATION	16
ACR PRACTICE PARAMETERS AND TECHNICAL STANDARDS	17

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Revisions

Date	Page Number	Description of Revisions
11/18/2013	10	Clarification that all ACR CT accredited sites must maintain a documented quality control (QC) program and must comply with the minimum frequencies of testing outlined in the manual effective 12/1/13.
7/27/2015	3	Increased pediatric age to ≤ 18 years and removed the specialty exam requirement
7/27/2015	4	Added application explanations for new units for sites with greater than 13 months left on current accreditation
7/27/2015	7	Added Radiologist qualifications for those who graduated residency after June 30, 2015
7/27/2015	10	Changed full annual system performance evaluation report to summary only
7/27/2015	13	Increased pediatric age to ≤ 18 years, removed the specialty exam requirement and included a link to Image Gently
7/27/2015	14	Updated exam selections
8/21/2015	9	Added NMTCB as acceptable technologist qualification
6/23/16	10	Added Maintenance of Certification for Medical Physics to physicist qualifications
12/9/16	15	Added pediatric abdomen dose reference values and pass/fail criteria for 32 cm phantom
2/1/17	16	Fee increase in phantom cost
12/28/17	3	Clarified that each unit must pass ACR accreditation testing for facility compliance
3/5/18	9	Clarified “direct” supervision as pertaining to physicist presence during surveys
4/11/18	17	Updated links to practice parameters and technical standards
1/9/19	11	Removed image thickness from list of annual physicist testing required

Overview

The CT Accreditation Program involves the acquisition of clinical and phantom images, dose measurements, and the submission of scanning protocols. 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. Every unit must apply for all modules routinely performed on that unit for a facility to be accredited. For sites that perform only adult CT scanning, clinical images required for submission will be in the modules routinely performed on that unit. For sites that do occasional pediatric scanning (≤ 18 years of age) in addition to adult work, an additional exam performed on a child will also have to be selected for submission. Sites that perform only pediatric examinations (*only* patients who are ≤ 18 years of age) will have to submit exams tailored to the pediatric population (see selection list under Clinical Images section for all three patient type scenarios).

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 CT, under the 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 CT 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 Reinstate**-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.

CT units that receive replacements or upgrades to any of the major subassemblies after accreditation is granted will be treated as new units and follow the procedures above. Facilities are only required to report modifications that change the unit’s model number. If the unit changes from an adult- or pediatric-only unit to an adult + pediatric unit, an additional adult or pediatric examination 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 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.

Personnel Qualifications

All interpreting physicians, medical physicists and technologists working in CT (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

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

Requirements for all Physicians Supervising and/or Interpreting CT 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 Medecins du Quebec ○ 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 2008 must also meet the following: <ul style="list-style-type: none"> ○ Oversight, interpretation and reporting of 300 CT examinations in the past 36 months^{1, 2} <li style="text-align: center;">OR (Not Board Certified) • Completion of an Accreditation Council for Graduate Medical Education (ACGME) or American Osteopathic Association (AOA) diagnostic radiology residency, and <ul style="list-style-type: none"> ○ Interpretation and reporting of 500 CT examinations in the past 36 months.³ <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 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>	<ul style="list-style-type: none"> • Completion of an accredited specialty residency, and • 200 hours of Category I continuing medical education (CME) in the interpretation of CT in the subspecialty where CT reading occurs, and • Interpretation and reporting of 500 cases during the past 36 months in a supervised situation.⁴
Continuing Experience	<p>Upon renewal, physicians reading CT examinations must meet the following: Currently meets the Maintenance of Certification (MOC) requirements for ABR (See ABR MOC)</p> <p style="text-align: center;">OR</p> <p>Physicians reading CT examinations across multiple organ systems must have read 200 CT exams over the prior 36 months.⁵</p> <p style="text-align: center;">OR</p> <p>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 CT 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:</p> <ol style="list-style-type: none"> 1. Currently meets the Maintenance of Certification (MOC) requirements for the ABR (See ABR MOC) <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 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) <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 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) 	

¹ 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.

³ Completion of an accredited radiology residency in the past 24 months will be presumed to be satisfactory experience for the reporting and interpreting requirement.

⁴ 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.

⁵ 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 CT 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 Medecins du Quebec For Radiologists 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 CT examinations within the last 36 months.^{6 7} <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 CT 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 CT, anatomy, physiology, and/or pathology or documented equivalent supervised experience in a center actively performing cardiac CT.⁵ 	<p style="text-align: center;">CARDIOLOGISTS⁸ (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 Cardiac CT <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> 150 Cardiac CT 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 CT in general and/or Cardiac CT 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 Cardiac CT <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> 300 Cardiac CT 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 CT in general and/or Cardiac CT 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 CT 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 CT to include, but not limited to: CT physics, recognition of artifacts, safety, instrumentation, and 40 hours specific to cardiovascular CT. <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 CT of the cardiovascular system during the past 36 months.⁵
Continuing Experience	Upon renewal, radiologists reading Cardiac CT 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 CT modules. ⁹	Upon renewal, cardiologists reading Cardiac CT 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 CT (half of which must be category 1) hours in the prior 36-month period and should include CME in Cardiac CT as is appropriate to the physician's practice needs.	Upon renewal, cardiologists must have earned at least 30 hours of coursework in the prior 36 month period in accordance with level 2 requirements.

⁶ 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.

⁷ 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.

⁸ 2005 ACCF/AHA Clinical Competence Statement on Cardiac CT and MR.

⁹ 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.

In addition, all physicians interpreting CT examinations must:

- Have completed an accredited diagnostic radiology residency or 80 hours of documented, relevant classroom instruction including diagnostic radiology and radiation safety physics. Otherwise, physicians must demonstrate training in the principles of radiation protection, the hazards of radiation exposure to both patients and radiological personnel, and appropriate monitoring requirements.
- Be thoroughly acquainted with the many morphologic and pathophysiologic manifestations and artifacts demonstrated on computed tomography. Additionally, supervising physicians should have appropriate knowledge of alternative imaging methods.
- Be knowledgeable of patient preparation, and training in the recognition/treatment of adverse effects of contrast materials¹⁰ for these studies.
- Be responsible for reviewing all indications for the examination; specifying the use, dosage, and rate of administration of contrast agents⁸, specifying the imaging technique, including appropriate windowing and leveling; interpreting images; generating written reports; and maintaining the quality of both the images and interpretations.
- Be familiar with the meaning and importance to the practice of CT of: total radiation dose to the patient, exposure factors, conscious sedation principles that are performed in the practice, and post-processing techniques and image manipulation on work stations.

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 related to radiation protection, the hazards of radiation exposure to both patients and radiological personnel, and appropriate monitoring requirements.
- Develop, implement and enforce policies and procedures to address safety issues, including contrast use and sedation, and reduce exposure as much as reasonably possible 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 Concerns.
- 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 CT 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 CT an adults-only approved scanner being used to scan pediatric patients).
- 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.

¹⁰ See the ACR Practice Parameter for the Use of Intravenous Contrast Media

Radiologic Technologist

Qualifications	Radiological Technologist
Initial	<ul style="list-style-type: none"> • ARRT registered (RT) and radiography (R) and/or computed tomography (CT) certified and/or NMTCB registered (CNMT) and/or unrestricted state license¹¹, and • Documented training and experience in CT, and • Documented training and experience in operating CT equipment and radiation physics and protection. • Passing an advanced examination for CT certification is recommended.
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

The qualified medical physicist:

- Must be familiar with the principles of imaging physics and of radiation protection; the guidelines of the National Council on Radiation Protection and Measurements; laws and regulations pertaining to the performance of the equipment being tested; the function, clinical uses, and performance specifications of the imaging equipment; and calibration processes and limitations of the instruments used for performance testing.
- The qualified medical physicist should be available for consultation regarding patient dosimetry issues within a reasonable period of time.

The qualified medical physicist is responsible for the conduct of all surveys of the CT equipment. The medical physicist may be *assisted* by properly trained individuals in obtaining data, in accordance with applicable regulations. These individuals must be approved by the medical physicist 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. Any assisting individual must be under the direct supervision* of the medical physicist during the surveys. The medical physicist **must be present** during the surveys; review, interpret, and approve all data; and provide a report of the conclusions **with his/her signature**.

*Direct supervision means that the medical physicist must be present in the facility and immediately available to furnish assistance and direction throughout the performance of the procedure. Direct supervision does not require that the medical physicist be present in the room when the procedure is being performed.

¹¹ Except where prohibited by state law or regulation, for initial accreditation and accreditation renewal, registered nuclear medicine technologists who have had appropriate training in CT with documentation as defined by the supervising physician at the site will be considered to be qualified to perform stand-alone CT and/or PET/CT exams. Registered CT technologists who have appropriate training (see <http://www.nmtcb.org/specialty/petExam.php>) in nuclear medicine are also considered qualified to do PET/CT. However, they are not considered qualified to perform stand-alone PET or other nuclear medicine studies. At the time of any site survey by the ACR, the site must provide documentation of training and experience. At the time of accreditation renewal, all CT technologists must have certification from NMTCB.

Effective *January 1, 2010*, all medical physicists providing these services *must* meet the following minimum criteria:

Qualifications	Medical Physicist
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 by the American Board of Medical Physics; or in Diagnostic Radiology 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 CT environment <p style="text-align: center;">OR</p> <p style="text-align: center;"><u>Grandfathered</u></p> <p>Conducted surveys of at least 3 CT units between January 1, 2007 and January 1, 2010</p>
Continuing Experience	Upon renewal, 2 CT unit surveys in prior 24 months
Continuing Education	<p>Upon renewal, must meet one of the following:</p> <ol style="list-style-type: none"> 1. Currently meet the Maintenance of Certification (MOC) requirements for ABR (see ABR MOC for Medical Physics) <p style="text-align: center;">OR</p> <p>Completes 15 CEU/CME (1/2 Cat 1) in the prior 36 months (must include credits pertinent to the accredited modality)</p>

Equipment

CT equipment specifications and performance shall meet state and federal requirements and applicable ACR Practice Parameters and Technical Standards.

Quality Control

A quality control (QC) program must be established and implemented under the supervision of a qualified medical physicist. Initial performance testing (acceptance testing) is required upon installation. Effective one year from the publication of the *2012 ACR CT Quality Control Manual* (12/01/2012), all ACR CT accredited facilities and those applying for accreditation must maintain a documented quality control (QC) program and must comply with the minimum frequencies of testing outlined in the manual.

Annual Medical Physicist Survey

All facilities applying for accreditation or renewal must demonstrate compliance with ACR QC requirements by including a copy of the facility's most recent [Annual CT System Performance Evaluation summary form](#) signed by a qualified medical physicist with their accreditation testing materials. The medical physicist must evaluate the performance of each CT unit at least annually. 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. Effective December 2013 this evaluation must include, but not be limited to, the following:

- Review of Clinical Protocols
- Scout Prescription and Alignment Light Accuracy
- Table Travel Accuracy
- Radiation Beam Width
- Low-Contrast Performance
- Spatial Resolution
- CT Number Accuracy
- Artifact Evaluation
- CT Number Uniformity
- Dosimetry
- Gray Level Performance of CT Acquisition Display Monitors
- Other tests as required by state or local regulations

Continuous Quality Control

A continuous quality control (QC) program must be established for all CT units with the assistance of a qualified medical physicist. An on-site radiological technologist should be identified to be responsible for conducting routine quality control.

The continuous QC program must include, but not be limited to, the following:

- Water CT Number & Standard Deviation- Daily
- Artifact Evaluation- Daily
- Wet Laser Printer Quality Control- Weekly (if applicable)
- Visual Checklist- Monthly
- Dry Laser Printer Quality Control- Monthly (if applicable)
- Display Monitor Quality Control- Monthly

All quality control testing must be carried out in accordance with written procedures and methods. Preventive maintenance must be scheduled, performed, and documented by a qualified service engineer on a regular basis. The results of the QC program must be monitored annually by the qualified medical physicist. If the results of a QC test fall outside the control limits, corrective action should be taken. A qualified medical physicist should be available to assist in prescribing corrective actions for unresolved problems. All deficiencies must be documented and service records maintained by the CT facility.

Quality Assurance

Policies and procedures related to quality, patient education, infection control, and safety should be developed and implemented in accordance with the ACR Policy on Quality Control and Improvement, Safety, Infection Control and Patient Education Concerns. The site will have a quality assurance program that incorporates the following two elements:

Physician Peer-Review Requirements

Examinations should be systematically reviewed and evaluated as part of the overall quality improvement program at the facility. 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.¹²

All sites initially applying for ACR accreditation and all sites renewing their accreditation must actively participate in a physician peer review program that performs the following 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.
- 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.

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.

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

Accreditation Testing

Clinical Images

The clinical examinations will be of the head/neck, chest, cardiac and abdomen regions. Three to four examinations and your *facility's protocol* for that examination must be submitted from each unit. The exact number of examinations depends on the number of modules for which the unit is used.

The facility may choose which examinations it will submit for accreditation (see selection list below). For units applying for cardiac, at least one CTA examination must be submitted, unless the unit is only used for patients 18 years of age and under, in which case the pediatric cardiac examination is required for the cardiac module. If the unit is also used for pediatric patients, at least one of the examinations must also be from a child between the ages of 0 and 18. ***Pediatric images should clearly reflect that the site has taken into account the child's age and body habitus in selecting the scanning parameters and contrast dosage. Please refer to Image Gently at www.imagegently.org and the FDA Pediatric X-ray Imaging webpage at***

¹² 2005 ACR Practice Parameters and Technical Standards. ACR Position Statement on Quality Control and Improvement, Safety, Infection Control, and Patient Education Concerns. Page IV.

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Pediatric Examination Choices			
Head/Neck	Chest	Abdomen	Cardiac
<ul style="list-style-type: none"> • Pediatric head CT • Pediatric sinus • Pediatric cervical spine • Pediatric temporal bones 	<ul style="list-style-type: none"> • Pediatric chest 	<ul style="list-style-type: none"> • Pediatric abdomen • Pediatric CT for adrenal/renal mass 	<ul style="list-style-type: none"> • Pediatric Cardiac such as for Congenital Disease
Adult Examination Choices			
<ul style="list-style-type: none"> • Adult head CT • Adult temporal bones • Adult cervical spine 	<ul style="list-style-type: none"> • Adult chest • Adult pulmonary embolus • Adult High-resolution CT of chest (HRCT) • Adult aortic dissection 	<ul style="list-style-type: none"> • Adult Abdomen • Adult Liver • Adult Renal • Adult Pancreas 	<ul style="list-style-type: none"> • Adult Coronary CTA

Facilities may not submit images 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.** Patient images will be returned with the final report if they are submitted by film or CD. *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 per unit
One module	Three examinations are required. If adult and pediatric, at least one of the exams must be pediatric.	Three*
Two modules	Three examinations are required. At least one exam from each module must be selected. If adult and pediatric, at least one of the exams must be pediatric.	Three
Three modules	Three examinations are required. One from each module. If adult and pediatric, at least one of the exams must be pediatric.	Three
Four modules	Four examinations are required. One from each module. The CTA or pediatric cardiac exam is required. If adult and pediatric, at least one of the exams must be pediatric.	Four

- *If the unit performs adult cardiac only, two coronary CTA exams are required.
- *If the unit performs pediatric cardiac only, two pediatric cardiac exams are required.
- *If the unit performs pediatric chest only, two pediatric chest exams are required.

Exam Identification and Labeling

Patient and technical data must be displayed on the images or be readily accessible in the DICOM header. All patient information annotated on clinical examinations will be kept confidential by the ACR, as stated in the Practice Site Accreditation Survey Agreement.

- Patient name (first and last)
- Patient age (or date of birth)
- Gender of patient, date of exam
- Institution Name
- Left/right labeling
- Technical parameters:
 - kV
 - mA (or mAs or effective mAs or mAs/slice, as reported by scanner)
 - Rotation time
 - Pitch (if available)
 - Reconstructed image thickness (slice width)
 - Reconstructed filter/kernel
 - Display field of view (FOV)
- Image number (numbered consecutively based on anatomic location)
- Table position (scan location)
- Presence or absence of IV contrast
- Dose report

Clinical Protocols

The typical scanning protocols for the submitted images will be required for accreditation; the submitted clinical images should reflect use of those protocols. The facility should submit its protocols in the format that it normally uses on site, but they need to be readily understandable by a reviewer charged with correlating those protocols with the submitted images.

A typical protocol should include at least the following elements:

- Indication
- Scanner acquisition settings (routine kV, mA/mAs/Effective mAs, collimation (N x T), pitch, rotation time, usage of radiation dose reduction methods (Automatic Exposure Control such as tube current modulation, settings for dose reduction methods, etc.)
- Phase of respiration
- Reconstruction settings (reconstructed image width (slice thickness), reconstruction interval, reconstruction kernel/filter, reconstructed field of view (FOV)
- Anatomical coverage (i.e. lung apices to lung bases, top of diaphragm to iliac crest, etc.)
- IV contrast (with injection rate and scan delay) if applicable
- EKG gating (cardiac studies) policy

There are many published sources of information on scanning protocols and procedures in ACR documents and in radiological journals and textbooks.

Phantom Testing: Image Quality and Dose

A single ACR phantom (Gammex 464) must be used for all units accredited at a facility. The phantom must be ordered from the manufacturer. The phantom order form is available at <http://www.acraccreditation.org/Modalities/CT>

Specific performance criteria evaluated using the phantom include:

- CT number accuracy
- Low-contrast resolution
- Image uniformity

A complete set of phantom images, along with dose images and measurements, from every CT unit at the facility must be submitted.

For accreditation purposes, it is necessary for your medical physicist to perform CTDI testing on every CT unit at your facility. Using these CTDI measurements, your physicist will be able to calculate various descriptors of dose for your adult head, pediatric head (1 year old), pediatric abdomen (5 year old, ~40 lbs.), and adult abdomen examinations (depending on the modules and patient types performed on that unit). These calculations will use the average technique factors provided by your facility. You can access the appropriate calculation spreadsheet at <http://www.acr.org/Quality-Safety/Accreditation/CT>.

In order to be accredited with the ACR, a CT unit must pass both the clinical and phantom image quality tests. The phantom will fail (and, the unit will fail ACR accreditation) if the dose from the CT unit exceeds the pass/fail criteria. The facility must repeat the entire phantom portion of the accreditation testing, *and pass*, for the unit to be granted accreditation.

The ACR has also updated the dose reference levels for the phantom submission. Reference levels help identify situations where doses are above expected values and should be investigated. Units exceeding these reference levels (but remaining below the pass/fail criteria) will ***not*** fail accreditation. However, even if the unit is granted accreditation, the ACR strongly urges the facility to consult with its medical physicist to determine if it is possible to reduce the examination dose without sacrificing image quality. Corrective action for exceeding dose reference values will be checked by a survey team if your facility is chosen for a validation on site survey.

These pass/fail criteria and reference levels are based on a detailed analysis of the dose data and image quality collected during the first three years of the accreditation program. The requirements and recommendations consider the amount of radiation necessary for adequate image quality. Because multislice CT units are more prevalent since the accreditation program started, the dose criteria and levels incorporate a more appropriate dose descriptor (CTDI_{vol}). This will help facilities reduce unnecessary radiation dose to patients undergoing CT examinations while still maintaining sufficient radiation levels necessary for appropriate diagnoses.

Note: A new pediatric abdomen (40-50 lb) reference value and pass/fail criteria has been implemented based on a 32 cm phantom use and is effective December 9, 2016.

ACR CT Accreditation Dose Pass/Fail Criteria and Reference Levels

Examination	Reference Values	Pass/Fail Criteria
	CTDI _{vol} (mGy)	CTDI _{vol} (mGy)
Adult Head	75	80
Adult Abdomen	25	30
Pediatric Head (1 year old)	35	40
Pediatric Abdomen (40-50 lb.) – 16 cm phantom	15	20
Pediatric Abdomen (40-50 lb.) – 32 cm phantom	7.5	10

Accreditation Fees

Checks should be made payable to the American College of Radiology (include modality accreditation ID#). 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 first unit up to three modules \$3000 for first unit for all four modules \$2800 each additional unit at one site location up to three modules \$2900 for each additional unit for all four 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 three modules \$3000 per unit for all four modules
Add Units (mid cycle) Add Module/Patient Type	\$2100 each unit \$2100 each unit
Replacement Certificate	\$50 per certificate.
Phantom	\$4495 for phantom. \$395 for carrying case and stand (optional).

Note: Fees subject to change without notice.

For Additional Information

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

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ACR Practice Parameters and Technical Standards

The following ACR Practice Guidelines and Technical Standards are available for your reference:

[ACR-SPR Practice Parameter for Imaging Pregnant or Potentially Pregnant Adolescents and Women with Ionizing Radiation](#)

[ACR-SPR Practice Parameter for the Use of Intravascular Contrast Media](#)

[ACR Practice Parameter for Performing and Interpreting Diagnostic Computed Tomography \(CT\)](#)

[ACR-ASNR Practice Parameter for the Performance of Computed Tomography \(CT\) of the Brain](#)

[ACR-ASNR-SPR Practice Parameter for the Performance of Computed Tomography \(CT\) of the Extracranial Head and Neck in Adults and Children](#)

[ACR-ASNR-ASSR-SPR Practice Parameter for the Performance of Computed Tomography \(CT\) of the Spine](#)

[ACR-SPR-STR Practice Parameter for the Performance of High-Resolution Computed Tomography \(HRCT\) of the Lungs in Adults](#)

[ACR-SPR Practice Parameter for the Performance of Computed Tomography \(CT\) of the Abdomen and Computed Tomography \(CT\) of the Pelvis](#)

[ACR-AAPM Technical Standard for Diagnostic Medical Physics Performance Monitoring of Computed Tomography \(CT\) Equipment](#)

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

[ACR-NASCI-SPR Practice Parameter for the Performance and Interpretation of Cardiac Computed Tomography \(CT\)](#)

[ACR-SCBT-MR-SPR Practice Parameter for the Performance of Thoracic Computed Tomography \(CT\)](#)