ACR CT Accreditation
Frequently Asked Questions

Application - General

Q. My facility has never applied for accreditation before, and would like to become ACR Accredited for Computed Tomography. How do we get started?
A. Start by reading the following documents, available on the ACR website:
   • The Diagnostic Modality Accreditation Program Overview
   • The ACR CT Accreditation Program Requirements
   • The ACR CT Accreditation Clinical Image Quality Guide
   • The ACR CT Accreditation Testing Instructions
   • The ACR CT Accreditation Phantom Testing Instructions

After reading these documents, and checking your protocols, you can apply online here:
https://acredit.acr.org

Q. Will CT accreditation become mandatory?
A. Currently, the ACR CT Accreditation Program is a voluntary process. However, effective January 1, 2012 all providers that bill for CT, MRI, breast MRI, nuclear medicine and PET under part B of the Medicare physician fee schedule must be accredited in order to receive reimbursement for the technical component from Medicare.

Q. Is my hospital required to be accredited under the new MIPPA legislation?
A. No. Part B of the Medicare physician fee schedule is for outpatient facilities.

Q. How many people at my facility are involved in the accreditation process?
A. Everyone at your facility is involved somewhat with accreditation, and should at least be aware of your facility’s participation. You should have one person who is “in charge” of organizing the project. You should have a “core team” made up of the following personnel:
   • Your lead CT technologist will be the main person we contact if necessary. This should be the primary person who completes the online accreditation application and testing package, and is the technologist contact listed on your application
   • Your CT supervising physician is the interpreting physician responsible for your CT protocols, and approves all aspects of the application and testing materials before you submit them to ACR for review.
   • Your medical physicist should be responsible for the annual system performance evaluation, supervising your facility’s QC and performing the dosimetry portion of your phantom submission. We also strongly recommend that they are closely involved with the Gammex phantom portion of your testing materials submission, and assist the supervising physician and lead technologist with your routine clinical protocols to help ensure the lowest technique possible while maintaining good image quality.
   • Your administrative contact, such as manager, director, etc. will help organize the members of your “core team” and ensure that everyone on the team has the resources necessary to successfully complete your accreditation process.
Q. How long does the accreditation process take?
A. On average, the process takes 4 to 6 months from start to finish.

Q. How much time do I have to return the testing package to the ACR?
A. The testing materials are due 45 days from the date the testing materials were mailed to your facility. The time frame is based on calendar days. After you apply for accreditation, you will receive all of the testing materials and labels. The due date is printed on the labels you receive. The 45 day timeframe is to make sure your facility gets through the accreditation process in a timely manner. If your facility needs extra time, please call an ACR accreditation representative at (800) 770-0145 and ask for an extension.

Q. Do sites have to submit images within a certain time frame?
A. Sites are given 45 days to complete the testing portion of the accreditation process. (Failure to comply with this time frame will result in your application being made inactive.) Ideally, the clinical and phantom images should be obtained in the same two month period. However, it is understood that this may be difficult in many circumstances. Therefore, images will be acceptable outside of that time frame as long as they do not predate the application by more than 6 months.

Q. Do facilities have to undergo a site survey as part of the accreditation process?
A. The accreditation process is conducted primarily by mail. The ACR and/or CMS will conduct site visits without prior notification to validate maintenance of accreditation criteria within the three year accreditation period.

Q. May we use a model or a volunteer to obtain clinical images to submit for accreditation?
A. No. Any clinical image submitted for accreditation review must be of an actual patient who needed the examination. Use of volunteers or models, including staff from your facility is prohibited and may result in withholding, denial or revocation of accreditation. Attempting to “pass off” images taken from a volunteer or model as clinical images from a patient may constitute fraud.

R. What happens if I fail?
A. You will only have to repeat the examinations that are deficient and not have to repeat the whole entire process again. The fee will be $800/scanner for clinical or phantom images and $1600/scanner if you have to repeat both. You will have 30 days to submit the repeated images.

Q. My facility did not pass accreditation. May we appeal the decision? If so, what's involved?
A. Yes. Facilities that receive a deficiency or a failure may appeal the determination in writing within 15 days of the date of the final report. You must send the original images for all of the submitted cases in the category that did not pass along with a letter describing your reason for appealing. Only those images reviewed for the original determination (and having the original labels) will be considered during the appeal evaluation. These will be forwarded to an arbitrator (a reviewer who did not participate in the initial review) with a copy of the previous reviews and the appeal letter written by the facility. No other images will be sent to the reviewer for consideration in the evaluation. The arbitrator's determination will be final.

Q. We recently appealed an adverse accreditation decision. When should we receive the results of the appeal?
A. You should receive the appeal results within 30 to 45 days of the date all required appeal materials were received by the ACR.

Q. We did not pass accreditation because our technologists selected and submitted the wrong images. May we appeal the decision and submit new cases?
A. Although you may appeal the decision, you may not submit new cases. During accreditation review, the ACR reviewers assume that the submitted cases were reviewed by the modality’s supervising physician (as specified in the Testing Instructions) and are examples of your best work. Consequently, during an appeal, you may only submit the original images with the original ACR labels.

Q. We did not pass accreditation because our technologist did not submit all required images and provided insufficient information with the images that were submitted. May we appeal the decision and submit the rest of the required information?
A. You may appeal the decision; however, you may only submit the original images with the original ACR labels. Please call the Diagnostic Modality Accreditation Information Line at (800) 770-0145 for further guidance on your specific situation.

Q. Can the clinical and phantom images be submitted in a digital format?
A. Sites have the option to submit images by CD or electronic upload. The instructions for submitting the images on CD can be found in the Testing Instructions here on the www.acr.org website under the CT Accreditation page. Instructions for electronic upload can be found in the “User Instructions for Electronic Submission of Images” found under the Program Requirements section of the CT Accreditation page.

Q. Does a physician have to be present during injection of intravascular contrast media?
A. A properly certified and/or licensed healthcare professional may perform the injection so long as a radiologist or his or her physician designee is present and immediately available to furnish assistance and direction throughout the performance of the procedure. The physician need not be in the same room.

Moved Facilities/Adding Units/Adding Modules

Q. How does a facility add a new unit to their existing accreditation?
A. Log on to your ACRedit home page at https://acredit.acr.org, click on “my modalities” and click on “units”.

Q. How do we add a module/patient type to our existing application?
A. Log on to your ACRedit home page at https://acredit.acr.org, click on “my modalities” and click on “units”. Once you click on units, click on the add module/patient type link associated with the unit you wish to add the module/patient type to.

Q. We will be moving our CT facility to a new address. Do I need to provide any information to the ACR?
A. Yes. Log on to your ACRedit home page at https://acredit.acr.org and then click on “my modalities”. Click on the “modality details” link for the site you wish to relocate, and click the “change” button next to the location address. The online accreditation system will prompt you for

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additional information. Please be advised that additional testing and fees may be associated with a relocation.

Phantom Submission, Dose and Physics Topics

Q. Where can I find information regarding reducing doses for pediatric and small adult patients?
A. 
   a. The Alliance for Radiation Safety in Pediatric Imaging has a wonderful website, Image Gently that has information on keeping radiation doses as low as possible for pediatric patients. The website is located here: http://www.pedrad.org/associations/5364/ig/
   b. The FDA sent out a public health notification on "Reducing Radiation Risk from Computed Tomography for Pediatric and Small Adult Patients" on November 2, 2001. This notification can be found on the FDA Web site at http://www.fda.gov/cdrh/safety/110201-ct.html.

Q. Is there an ACR CT Accreditation designated phantom? If so, when should one be ordered?
A. Yes, it is available to purchase through Gammex RMI. You can access the phantom order form from the www.acr.org website under the CT Accreditation page.
   Please make sure that you order your phantom as soon as possible after you receive your CTAP number (assigned to you with your initial application) to allow ample time for shipping and completion of all testing materials within the allotted time frame provided by the ACR.

Q. What will be the requirements for phantom testing?
A. Phantom images and dose measurements will be required from every unit being accredited, depending on the use of the unit. Using the Gammex 464 phantom, and Computed Tomography Dose Index (CTDI) phantoms, a medical physicist must perform dose measurements on every scanner that you will be submitting for accreditation. Using these CTDI measurements, your physicist will be able to calculate various descriptors of dose for your adult head, pediatric head (1 y.o.), pediatric abdomen (5 y.o., approx. 40 lbs) and adult abdomen examinations in correlation to your use of the scanner and your application.

Q. Do you need a Medical Physicist Survey for each scanner?
A. Yes, a Medical Physicist Survey must be done yearly for each scanner being accredited. However, the site does not have to send the report to the ACR.

Q. Can I use “Air kerma” for the dose measurements on the phantom portion of my accreditation submission?
A. No. The dose forms that you will use as part of the online testing package are calculated using exposure readings, not air kerma. If your meter reads out air kerma, you must either change your meter settings or divide by 0.876 before entering the measurements into the data form.

Q. Our scanner has several protocols that are done in a single gantry rotation, with no table movement, and which use collimations greater than 100mm, i.e. the length of my ion chamber. How do I calculate the dose for these protocols?
A. For single rotation protocols with clinical collimations greater than 100mm, e.g. 320 x 0.5mm, make the physical dose measurement in the same way you ordinarily would by centering the phantom/ion chamber and performing an axial rotation using the actual clinical technique and collimation. In this situation the x-ray beam will exceed the length of the chamber but this will be taken in account in the CTDI field on the dose form in your online testing package (and the generic excel form available on the ACR CT Accreditation Testing and QC forms webpage) to avoid an inaccurately low CTDIvol. For collimations that equal or exceed 100mm, the dose index should be determined by using 100mm in lieu of NxT in the calculation.

Q. The Aquilion One in Volume Mode sometimes give me some bleed-through of the CT number module into the low contrast module, how do I address this?
A. This effect can be eliminated by applying VCOR. VCOR lets the reconstruction engine know the object on the table is not a patient, but rather an artificial construct about which no clinical assumptions can be made. VCOR can be activated by your service engineer or via a dropdown menu, depending on software version.

Q. My scanner uses a “flying-focal spot”. How do I enter Nmax in the phantom data form and the N values in the clinical protocols?
A. Nmax is the maximum number of tomographic sections that can be acquired in a single rotation. N = the number of actual data channels used. For example, a Siemens Somatom Sensation 64 scanner utilizes a flying focal spot and has an Nmax = 64. However when a site uses the collimation setting identified on the scanner as “64x0.6” (for example, for the clinical adult abdomen protocol), then N = 32 and T = 0.6 mm. because the 32 actual detectors are used and sampled twice via the flying focal spot. Another example is the Siemens Definition Flash, which also utilizes a flying focal spot. For this scanner, Nmax=128 and the collimation setting on the scanner is identified as “128x0.6”, but the actual number of data channels is 64, so N=64 and T=0.6 in the clinical protocol table (in this scanner, 64 actual detector rows are used and sampled twice via the flying focal spot in a manner similar to the scanner above). Other scanners use “flying focal spot” technology and should be handled similarly.

For dosimetry testing, it is the radiation beam width that is needed for recording in the dosimetry spreadsheet and two possible solutions may arise. (1) If the scanner allows the same detector configuration in both axial (sequential) mode as well as helical scan, then the value of N and T described above should be used. The table increment in the dosimeter spreadsheet must be adjusted to yield the proper clinical pitch as indicated in the phantom data form. Please see the examples below; (2) if the scanner does not allow the same detector configuration in helical and axial (sequential) modes, then please see the discussion in the next FAQ.

Example 1: Siemens Sensation 64 scanner
Adult Abdomen Protocol: 120 kVp, 200 Quality Reference mAs, 64x0.6 mm collimation (using z-flying focal spot), pitch 1.0
In protocol table, use values: N=32, T=0.6 mm, I = 19.2 mm/rotation
However, 32 x 0.6 mm is not allowed in sequential mode on this scanner, so for dosimetry testing, please see the next FAQ

Example 2: Siemens Definition Flash Scanner
Adult Abdomen Protocol: 120 kVp, 200 Quality Reference mAs, 128x0.6 mm collimation (which uses z-flying focal spot), pitch 1.0
N=64, T=0.6 mm, I = 38.4 mm/rotation
In this case, 128x0.6 mm is allowed in sequential mode, so no need to change settings for dosimetry:
N=64, T=0.6 mm, I=38.4 mm/rotation
Q. **How do I make CTDI measurements using a detector configuration that is not available in the axial mode?**

A. This situation arises when a scanner manufacturer limits the available scan modes. For example, some manufacturers simply do not allow an axial 64 x 0.6 mm detector configuration (where the outer images might suffer from considerable cone beam artifacts). This can make it difficult to perform CTDI measurements when 64 x 0.6 mm collimation is used for helical scans.

Now there are fundamentally two options. The first is to use user tools specifically developed to assist in making axial CTDI measurements using clinically relevant parameters and detector configurations that might not be available in an axial (sequential) scan mode. One example is that Siemens has developed a “customer CTDI” measurement tool. This is available on Definition scanner models with software version VA34, VA40, or VA44, and Emotion or Sensation scanners with software version VB40. Instructions for use of the mode are included in the online operator manual (Life Card).

If this option is not available, then the user can perform the axial CTDI measurements using settings (including collimation) that are “as close as possible” to the clinical setting. The site should describe this situation as well as the settings chosen to perform the CTDI measurements. These new settings should be reported in the dosimetry spreadsheet with a note that they are different from those used clinically (and reported in the clinical protocol table). Please note that if collimation is changed for dosimetry testing purposes, then the table increment value (I) should also be changed to yield the same pitch value used clinically. An example is provided below.

**Example 1: Siemens Sensation 64 scanner**

- Adult Abdomen Protocol: 120 kVp, 200 Quality Reference mAs, 64x0.6 mm collimation (using z-flying focal spot), pitch 1.0
- In protocol table, use values: N=32, T=0.6 mm, I = 19.2 mm/rotation
- However, 32 x 0.6 mm is not allowed in sequential mode on this scanner, so for dosimetry testing, there are two choices:
  - Option 1 –use the customer CTDI measurement tool if it is available on your scanner.
  - Option 2 - use settings that are “as close as possible” to the clinical setting, which in this case could be:
    - N=24, T=1.2 mm
    - With a Table feed (I) necessary to give same pitch (Pitch = 1.0), I=28.8 mm/rotation

Q. **My scanner scans with a 420 degree tube rotation (an extra 1/6 of a rotation) for each axial scan for our head protocol. We use 200 mAs with a 1.0 second rotation time, however, the actual time for each scan is 1.167 seconds which makes the mA about 171. How should the scanning parameters be entered on the phantom data form and dose calculator spreadsheets?**

A. If the scan is done in a 420 overscan mode, then record the rotation time as 1.167 seconds and the mA as 171.

Q. **Our protocols include iterative reconstruction to reduce noise and ultimately allow us to use a reduced technique on our patient exams. How should this be used for the phantom scanning for accreditation?**

A. If iterative reconstruction is used clinically, then it can be used on the phantom scanning. Tube current modulation should be turned off and iterative reconstruction should be noted as a “Dose Reduction Method” in the phantom scanning data form.

Q. **When I look at the exposure time tag (0018, 1150) in the DICOM header of an image, I see a number that is some factor greater than the acquisition rotation time and it doesn’t correspond to the time for one complete gantry rotation. How should I report this and will reviewers think we used the wrong rotation time?**
Some manufacturers use a value other than the time for one complete rotation in this particular DICOM tag (0018, 1150). Unfortunately, this is set at the factory and the user does not have control over this. You can check and see if the scanner reports the “revolution time” DICOM tag (0018,9305) as this is reported on an increasing number of scanners. If so, this can be pointed out to in your submission. ACR is making its CT reviewers aware of this potential discrepancy as well.

Q. My scanner passes the manufacturer’s QA specification for water calibration (e.g. water is 0 +/- 5 HU), but the CT number of some of the cylinders in module 1 of the ACR phantom are not within the appropriate range. What can I do to correct this situation without causing a failure due to poor testing procedures?
A. The ACR phantom can be scanned in the opposite direction (from section 4 toward section 1 instead of from section 1 to section 4). This will result in the phantom images appearing in the reverse order on the CD, but this will be acceptable. Alternatively, a water phantom or CTDI phantom can be positioned on the patient table in a manner that effectively extends the ACR phantom somewhat, and fills the air gap that causes the problem (see figure 1). The water or CTDI phantom may have to be raised a bit to match the ACR phantom height; anything that is not a major attenuator will serve as a shim (such as a few towels or folded up bed linens). In this case, the scan acquisition directions could be followed per the original instructions (from section 1 toward section 4). Additionally, phantom reviewers may use an image that is closest to Module 2, further reducing the impact of the helical interpolation. If this is indicated, please put a note to this effect in with the CD so that the reviewer is alerted.