The IAC Standards and Guidelines for CT Accreditation
# Table of Contents

All entries in Table of Contents are linked to the corresponding sections.

## Introduction

Part A: Organization

Section 1A: Personnel and Supervision

Section 2A: Facility

Section 3A: Examination Reports and Records

Section 4A: Facility Safety

Section 5A: Administrative

Section 6A: Multiple Sites (Fixed and/or Mobile)

Part B: Examinations and Procedures

Section 1B: Instrumentation and Equipment

Section 2B: Protocols

---

**Guidelines**

<table>
<thead>
<tr>
<th>Section</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1A: Personnel and Supervision</td>
<td>STANDARDS – Medical Director, Technical Director, Medical Staff, Technical Staff, Medical Physicist or Qualified Expert, Supervising Personnel for Contrast and/or Medication Administration, Support Services</td>
</tr>
<tr>
<td>Section 2A: Facility</td>
<td>Examination Areas, Interpretation Areas, Storage Space</td>
</tr>
<tr>
<td>Section 3A: Examination Reports and Records</td>
<td>Records, Examination Interpretation and Reports</td>
</tr>
<tr>
<td>Section 4A: Facility Safety</td>
<td>Patient and Facility Safety</td>
</tr>
<tr>
<td>Section 5A: Administrative</td>
<td>Patient Confidentiality, Patient or Other Customer Complaints, Primary Source Verification</td>
</tr>
<tr>
<td>Section 6A: Multiple Sites</td>
<td>Multiple Sites</td>
</tr>
<tr>
<td>Section 1B: Instrumentation and Equipment</td>
<td>Instrumentation, Equipment Quality Control, Quality Control Documentation</td>
</tr>
<tr>
<td>Section 2B: Protocols</td>
<td>Procedure Volumes, Indications, Ordering Process and Scheduling, Techniques</td>
</tr>
</tbody>
</table>

---

The IAC Standards and Guidelines for CT Accreditation

Updated 8/2012
Introduction

The Intersocietal Accreditation Commission (IAC) accredits imaging facilities specific to Computed Tomography (CT). IAC accreditation is a means by which facilities can evaluate and demonstrate the level of patient care they provide.

A CT facility (i.e., imaging center, physician office, hospital) is a unit under the overall direction of a Medical Director with a Technical Director who is appointed and responsible for direct supervision of the technical staff members and the daily operations of the facility.

The intent of the accreditation process is two-fold. It is designed to recognize facilities that provide quality CT services. It is also designed to be used as an educational tool to improve the overall quality of the facility.

The following are the specific areas of CT for which accreditation may be obtained:

- coronary calcium scoring CT
- coronary CTA
- neurological CT [brain, spine, CTA]
- sinus and temporal bone CT
- body CT [chest (non-coronary), abdomen, pelvis, extremity]
- vascular/other CTA [chest (non-coronary), abdomen, pelvis, peripheral/extremity]

In addition to all standards listed below, the facility, including all staff, must comply at all times with all federal, state and local laws and regulations, including but not limited to laws relating to licensed scope of practice, facility operations and billing requirements.

These accreditation Standards and Guidelines are the minimum standards for accreditation of CT facilities. Standards are the minimum requirements to which an accredited facility is held accountable. Guidelines are descriptions, examples, or recommendations that elaborate on the Standards. Guidelines are not required, but can assist with interpretation of the Standards.

Standards are printed in regular typeface in outline form. Guidelines are printed in italic typeface in narrative form.
Part A: Organization

Section 1A: Personnel and Supervision

STANDARD – Medical Director

1.1A The Medical Director must be a licensed physician and certified by the American Board of Medical Specialties (ABMS), in a relevant specialty, or board certified in a relevant specialty recognized by the American Osteopathic Association, Royal College of Physicians and Surgeons of Canada or Le College des Medics du Quebec.

1.1.1A Medical Director Required Training and Experience

The Medical Director must demonstrate an appropriate level of training and experience by meeting one or more of the following:

1.1.1.1A Cardiac CT

Completion of Level 2 or equivalent training meeting ACCF/AHA/ACP guidelines [See Appendix] for cardiovascular CT with SCCT letter of verification or a letter of verification from the program director and independent interpretation of at least 50 CT examinations.

OR

Diplomat of the Certification Board of Cardiovascular Computed Tomography (CBCCT) or Certificate of Advanced Proficiency in Cardiac CT offered through the American College of Radiology (ACR).

OR

1.1.1.2A Non-cardiac CT – Interpretation of at least 150 studies (with at least 50 where the candidate is physically present and involved in the acquisition and interpretation of the case) and attendance in at least 20 hours of CT classes relevant to the specialty with a letter of verification from the program director and independent interpretation of at least 50 CT examinations.

OR

1.1.1.3A Established Practice – A physician, who has been interpreting CT studies for at least five years, has acquired a minimum of 150 hours Category I Continuing Medical Education (CME) (obtained over the course of their professional experience) and has interpreted a minimum of 500 CT examinations relative to the organ system(s) with self attestation.

AND for all training and experience pathways listed above 40 hours of CT relevant CME. A minimum of three hours of documented continuing education must be in radiation safety.

(See Guidelines on Page 11 for further recommendations.)
1.1.2A Medical Director Responsibilities

The Medical Director responsibilities include but are not limited to:

1.1.2.1A all clinical services provided and for the determination of the quality and appropriateness of care provided;

1.1.2.2A supervising the entire operation of the facility or delegate specific operations to associate Medical Directors, medical staff and the Technical Director;

1.1.2.3A arranging for qualified providers in the absence of medical staff for contrast administration, drug administration and patient and staff safety;

1.1.2.4A assuring compliance of the medical and technical staff to the standards outlined in this document and the supervision of their work;

1.1.2.5A must be an active participant in the interpretation of exams performed in the facility;

Comment: If not generating final reports, the Medical Director must provide documentation of review and acceptance, or amendment of findings.

1.1.2.6A the Medical Director, in consultation with the medical physicist and/or qualified expert, may delegate the operation of the CT scanner to a qualified physician as outlined in 1.2.1.3A based on potential dose to the patient and technical complexity of the CT system as long as the state permits physicians to operate x-ray producing equipment.

1.1.3A Continuing Medical Education (CME) Requirements

1.1.3.1A The Medical Director must document at least 15 hours of Category I American Medical Association (AMA) or Physician Recognized Award (PRA) CME credits in CT over a period of three years.

i. A minimum of three hours of the documented 15 hours of CME must be related to radiation safety.

ii. Yearly accumulated continuing education must be kept on file and available to the IAC, when requested.

Comment: If the Medical Director has completed training or certification, as specified under 1.1.1A in the past three years, the CME requirement will be considered fulfilled.

STANDARD – Technical Director

1.2A The Technical Director (i.e., supervisor, chief technologist, manager, etc.) designated to the facility must be a qualified CT technologist or a physician as described in 1.2.1.3A. The Technical Director must have appropriate training, technical certification as noted and documented experience in the field of computed CT imaging.

Comment: In a facility with no technologists, the Medical Director or a member of the medical staff may serve as Technical Director. In this case, the Medical Director or Medical staff must meet the requirements of the Technical Director and submit appropriate documentation of radiation safety and scanner training.

1.2.1A Technical Director Required Training and Experience

The Technical Director must meet one of the following criteria:

1.2.1.1A American Registry of Radiologic Technologists (ARRT) or the Canadian Association of Medical Radiation Technologists (CAMRT) certification in computed tomography imaging (i.e., RT (CT)).
1.2.1.2A An appropriate nationally recognized credential in another medical imaging field to include radiation safety training (i.e., CNMT, RT (MR), RT).

AND

One year of full-time equivalent experience as a CT technologist and performance of a minimum of 100 CT examinations.

OR

1.2.1.3A A qualified licensed physician may operate a volume or cone beam CT scanner (for sinus and temporal bone imaging only) if that person has received a minimum of at least three hours of documented, specific training in radiation safety provided by a medical physicist or qualified expert and received a 100% score on a written examination administered by the provider of the radiation safety training program.

AND

Received a minimum of at least four hours of documented, specific training in the operation of the scanner.

1.2.2A Technical Director Responsibilities

1.2.2.1A The Technical Director reports directly to the Medical Director or his/her delegate. Responsibilities include, but are not limited to:

i. all facility duties delegated by the Medical Director;
ii. performance of CT examinations in the facility;
iii. supervision of the technical staff and/or ancillary staff (if applicable);
iv. the delegation, when warranted, of specific responsibilities to the technical staff and/or the ancillary staff;
v. daily technical operation of the facility (i.e., facility record keeping, calibration log, quality assurance, scanning protocols, etc.);
vi. operation and maintenance of facility equipment;
vii. the compliance of the technical staff to the IAC CT Standards outlined within this document;
viii. working with the Medical Director, medical staff and technical staff to ensure quality patient care;
ix. technical training (if applicable); and
x. monitoring radiation exposure for both patients and staff.

1.2.3A Continuing Education (CE) Requirements

1.2.3.1A The Technical Director must document at least 15 hours of Category IAMA or Recognized Continuing Education Evaluation Mechanism (RCEEM) approved CT-related CE over a period of three years.

i. A minimum of three hours of the documented 15 hours of CE must be related to radiation safety.

ii. Yearly accumulated CE must be kept on file and available to IAC, when requested.

Comment: If the Technical Director has successfully acquired an appropriate CT credential within the past three years, the continuing education requirement will be considered fulfilled.
STANDARD – Medical Staff

1.3A All members of the medical staff must be licensed physicians and American Board of Medical Specialties (ABMS) board certified in a relevant specialty or board certified in a relevant specialty recognized by the American Osteopathic Association, Royal College of Physicians and Surgeons of Canada or Le College des Medicins du Quebec.

1.3.1A Medical Staff Required Training and Experience

The medical staff must meet one of the following criteria:

1.3.1.1A Cardiac CT

Completion of Level 2 or equivalent training meeting ACCF/AHA/ACP guidelines for cardiovascular CT (which includes attendance in at least 20 hours of CT classes relevant to the specialty, a portion of which are in radiation safety) with SCCT letter of verification or a letter of verification from the program director. (See Appendix)

OR

Diplomat of the Certification Board of Cardiovascular Computed Tomography (CBCCT) or Certificate of Advanced Proficiency in Cardiac CT offered through the American College of Radiology (ACR).

OR

1.3.1.2A Non-cardiac CT – Interpretation of at least 150 studies (with at least 50 where the candidate is physically present and involved in the acquisition and interpretation of the case) and attendance in at least 20 hours of CT classes relevant to the specialty, a portion of which are in radiation safety, with a letter of verification from program director.

OR

1.3.1.3A Established Practice – A physician who has been interpreting CT studies for at least five years, has acquired a minimum of 150 hours Category I CME (obtained over the course of their professional experience) and has interpreted a minimum of 500 CT examinations relative to the organ system(s) with self attestation.

AND

40 hours of CT relevant CME. A minimum of three hours of documented continuing education must be in radiation safety.

(See Guidelines on Page 11 for further recommendations.)

1.3.2A Medical Staff Responsibilities

Medical staff responsibilities include but are not limited to:

1.3.2.1A The medical staff interprets and/or performs clinical CT examinations in compliance with the requirements established by the Medical Director. If not generating final reports, the medical staff member must provide documentation of review and acceptance or amendment of findings.
1.3.3A Continuing Medical Education (CME) Requirements

1.3.3.1A The medical staff must document at least 15 hours of Category I AMA or PRA CME credits in CT over a period of three years.

i. A minimum of three hours of the documented 15 hours of CME must be related to radiation safety.

ii. Yearly accumulated continuing education must be kept on file and available to the IAC CT, when requested.

Comment: If the medical staff has completed training or certification as specified 1.3.1.1A or 1.3.1.2A in the past three years, the CME requirement will be considered fulfilled.

STANDARD – Technical Staff

1.4A All members of the technical staff must be qualified imaging technologists or a qualified physician (as outlined) for cone beam CT performing sinus and temporal bone CT imaging only.

1.4.1A Technical Staff Required Training and Experience

All members of the technical staff must meet one or more of the following criteria:

1.4.1.1A American Registry of Radiologic Technologists (ARRT) or the Canadian Association of Medical Radiation Technologists (CAMRT) certification in CT imaging (i.e., RT (CT)).

OR

1.4.1.2A An appropriate nationally recognized credential in another medical imaging field (i.e., CNMT, RT (MR), RT).

OR

1.4.1.3A Completion of 12 months full-time (35 hours/week) clinical CT experience under direct supervision of a credentialed technologist plus ONE of the following:

i. Completion of a formal two-year program or equivalent in another medical imaging profession, with concentration in radiation physics.

ii. Completion of a bachelor’s degree in another medical imaging specialty, with concentration in radiation physics.

OR

1.4.1.4A In a facility with no technologists, a qualified licensed physician may operate a volume or cone beam CT scanner (for sinus and temporal bone imaging only) if that person has received a minimum of at least three hours of documented, specific training in radiation safety provided by a medical physicist or qualified expert and received a 100% score on a written examination administered by the provider of the radiation safety training program. AND

Received a minimum of at least four hours of documented, specific training in the operation of the scanner.

1.4.2A Technical Staff Responsibilities

Technical staff responsibilities include but are not limited to:
1.4.2.1A reports to the Technical Director; and

1.4.2.2A assumes the responsibilities specified by the Technical Director and, in general, is responsible for the performance of clinical CT examinations and other tasks assigned.

1.4.3A Continuing Education (CE) Requirements

1.4.3.1A The technical staff must document at least 15 hours of Category I AMA or RCEEM approved CT-related CE over a period of three years.

i. A minimum of three hours of the documented 15 hours of CE must be related to radiation safety.

ii. Yearly accumulated continuing education must be kept on file and available to IAC CT, when requested.

Comment: If the technical staff member has successfully acquired an appropriate CT credential within the past three years the continuing education requirement will be considered fulfilled.

STANDARD – Medical Physicist or Qualified Expert

1.5A The medical physicist must be board certified by the American Board of Radiology, the American Board of Medical Physics, or the Canadian College of Medical Physics in a discipline that includes diagnostic imaging.

Comment: In states where medical physicists or qualified experts are licensed, registered or otherwise state-approved to measure dose and evaluate image quality at CT scanning facilities, these credentials are acceptable.

1.5.1A Responsibilities

1.5.1.1A Other personnel, deemed by the medical physicist as competent to perform the assigned tasks, are permitted to assist the medical physicist or qualified expert in data collection.

1.5.2A Continuing Education (CE) Requirements

1.5.2.1A The medical physicist must document at least 15 hours of Category I AMA, Commission on Accreditation of Medical Physicists Educational Programs (CAMPEP) or the American College of Radiology (ACR) Medical Education for Physicists (MEP) approved physics related CE over a period of three years.

i. A minimum of three hours of the documented 15 hours of CE must be related to radiation safety.

ii. Yearly accumulated continuing education must be kept on file and available to IAC CT, when requested.

STANDARD – Supervising Personnel for Contrast and/or Medication Administration

1.6A If the Medical Director or medical staff are not present during the CT examination, delegation of contrast and/or medication administration supervision and safety duties may be relegated to alternative licensed providers (i.e., RN, NP, or PA) that meet the following criteria:

1.6.1A Are knowledgeable of patient preparation, and training in the recognition/treatment of adverse effects of contrast materials for these studies.

1.6.2A Are responsible for supervising the use, dosage, and rate of administration of contrast agents, per the facility’s protocol.
1.6.3A Possess familiarity with radiation safety, and the conscious sedation policies and procedures (if used) that are performed relative to CT.

1.6.4A Are responsible for supervising the administration of beta-blockers, nitrates, and/or other cardio active and/or other medications per the facility’s protocol.

STANDARD – Support Services

1.7A Ancillary personnel (i.e., clerical, nursing, transport, etc.) necessary for safe and efficient patient care are provided.

1.7.1A Clerical and administrative support must be sufficient to ensure efficient operation and record keeping.

1.7.2A Nursing and ancillary services must be sufficient to ensure quality patient care and are available when necessary.

1.7.3A Supervision: The Medical Director must ensure that appropriate support services are provided in the best interest of patient care.

(See Guidelines on Page 11 for further recommendations.)

Section 1A: Personnel and Supervision Guidelines

1.1.1A Medical Director required training and experience: The majority of the 40 required CME hours should be Category I.

1.3.1A Medical staff required training and experience: The majority of the 40 required CME hours should be Category I.

1.6A The use of a qualified medical physicist is encouraged for initial acceptance testing, to establish and monitor the quality control program and radiation safety policies and procedures.
Section 2A: Facility

STANDARD – Examination Areas

2.1A Examinations must be performed in a setting providing patient and technical staff safety, comfort and privacy.

2.1.1A The adequate performance of a CT examination requires the proper positioning of the patient. For this reason, adequate spacing is required for inclusion of a CT imaging system and patient privacy.

2.1.1.1A Patient privacy must be assured with the use of appropriate curtains or doors.

2.1.1.2A A sink and antiseptic soap must be readily available and used for hand washing in accordance with the infection control policy of the facility.

2.1.1.3A Direct visualization and audible monitoring of the patient must be available through a leaded glass window, while protecting the personnel from radiation exposure.

2.1.1.4A Post testing area must be available for patient observation, as indicated clinically.

STANDARD – Interpretation Areas

2.2A Adequate designated space must be provided for the interpretation of the CT examination and the preparation of reports.

(See Guidelines on Page 12 for further recommendations.)

STANDARD – Storage Space

2.3A Space permitted for storage of records and supplies must be sufficient for the patient volume of the facility.

Section 2A: Facility

Guidelines

2.2A Space should be provided for data evaluation, interpretation, and discussion of the study with the technologist and/or referring physician.
Section 3A: Examination Reports and Records

STANDARD – Records

3.1A Provisions must exist for the generation and retention of examination data for all CT examinations performed.

3.1.1A A system for recording and archiving CT data (images, measurements and final reports) obtained for diagnostic purposes must be in place.

3.1.2A A permanent record of the images and interpretation must be made and retained in accordance with applicable state or federal guidelines for medical records. Critical reconstructed CT data should be readily retrievable for comparison with new examinations. A complete series of digital axial images, reconstructed in at least one phase for gated studies, must be permanently stored in a format that will allow future multi-planar reformatting.

3.1.3A Archiving media must include loss-less digital storage and a system for long-term, offline digital storage.

STANDARD – Examination Interpretation and Reports

3.2A Provisions must exist for the timely reporting of examination data.

3.2.1A All CT examinations must be reviewed promptly after the study is completed, as appropriate for the risk of clinically significant results at least within one working day. Results of examinations with critical findings must be communicated to the referring physician as quickly as clinically indicated.

3.2.2A A mechanism for communicating any significant changes must be defined for those situations in which the final interpretation differs significantly from the preliminary report.

3.2.3A CT examinations must be interpreted and reported by the Medical Director or by a member of the medical staff of the CT facility. Final physician interpretations of routine CT examinations must be available within two working days. An interpretation can be in the form of paper, digital storage or an accessible voice system.

3.2.4A The final verified, signed report must be available in a timely fashion, generally within four working days.

(See Guidelines on Page 14 for further recommendations.)

3.3A CT examination reporting must be standardized in the facility. All physicians interpreting CT examinations in the facility must agree on a standardized report format.

3.3.1A The final report must accurately reflect the content and results of the study. The report must include, but is not limited to:

3.3.1.1A date of the examination;

3.3.1.2A clinical indications leading to the performance of the examination; and

3.3.1.3A an adequate description of the test performed including the:

i. patient date of birth or age;

ii. patient ID or name;
iii. name of the examination;
iv. protocol used in the examination;
v. quality of the study;
vi. details of drug and/or medication administration (include the name, dose administered and route); and
vii. administration of contrast, if used (include the name, type, and amount of IV contrast administered).

(See Guidelines on Page 14 for further recommendations.)

3.3.1.4A an overview of the results of the examination including pertinent findings;

Comment: This must include localization and quantification of abnormal findings (where appropriate).

3.3.1.5A appropriate recommendation for follow up of incidental findings;

3.3.1.6A the reasons for limited examinations (if performed);

3.3.1.7A a summary of the test findings;

3.3.1.8A comparison with previous studies (if available);

3.3.1.9A reports must be typewritten;

3.3.1.10A physician signature line (the printed name of the interpreting physician);

3.3.1.11A manual and/or electronic interpreting physician signature; and

3.3.1.12A date of interpreting physician signature and/or verification.

(See Guidelines on Page 14 for further recommendations.)

Section 3A: Examination Reports and Records

Guidelines

3.2.1A A record of the communication should be maintained.

3.2.2A If preliminary results are provided by an interpreting physician, the final report should be generated within two working days.

3.3.1A Documentation of dose reduction technique if used (e.g., prospective gating, low energy and/or dose modulation) is recommended in the report.

3.3.1.3A Details of any non-standard patient preparation or treatment, if required, should be included in the final report.
Section 4A: Facility Safety

STANDARD – Patient and Facility Safety

4.1A Written policies and procedures must exist to ensure patient and personnel safety. Safety policies must be enforced, reviewed and documented annually by the Quality Improvement (QI) Committee or the Medical Director.

Comment: If a facility performs CT imaging for patients presenting with acute stroke symptoms, refer to the Acute Stroke Appendix for details.

(See Guidelines on Page 17 for further recommendations.)

4.1.1A Patient Identification Policy – For all clinical procedures there must be a process that assures accurate patient identification prior to initiating the procedure. Two independent patient-specific identifiers must be used.

(See Guidelines on Page 17 for further recommendations.)

4.1.2A There must be at least one BLS certified staff member on site for all CT exams.

4.1.3A Standard CT examinations must be safe to both patients and technologists. The facility must have a written procedure in place for handling acute medical emergencies.

4.1.4A Radiation Safety

4.1.4.1A All CT facility professionals must have an understanding of the radiation exposure involved in CT to advise patients undergoing CT imaging.

4.1.4.2A A separate, radiation shielded control room or area must be used by staff during acquisitions. No staff should routinely enter the CT room or area when the x-ray tube is active.

4.1.4.3A Staff radiation exposure must be monitored, and reviewed by the Quality Improvement (QI) Committee. The results must be communicated to the staff member. The facility must comply with the currently published ALARA recommendations for personnel.

4.1.4.4A There must be restriction of the public to radiation areas.

4.1.4.5A Separate pediatric protocols must be established based on patient age or weight. Pediatric protocols must be modified to reduce radiation exposure where appropriate or possible. The use of higher than recommended radiation doses must be justified.

4.1.4.6A Use of appropriate radiation dose reduction devices OR techniques for appropriate moderation of exposure must be documented or their lack of use justified when applicable. Dose reduction techniques include but are not limited to prospective gating, tube modulation (kVp and/or mAs), manufacturer dose reduction protocol and/or dose modulation.

i. The facility must subscribe to dose optimization to patients.
ii. Radiation dose for CT acquisition must be set at the lowest values that are consistent with satisfactory image quality for the study ordered.
iii. Modifications to the manufacturer's default protocols that increase patient dose above the site appointed physicist recommendation must be reviewed by a medical physicist prior to implementation of the proposed change(s) in order to assess impact on radiation dose and image quality.
iv. If the physicist deems that the proposed change(s) is appropriate, the facility must maintain documentation of the protocol change(s) that includes the rationale for the change, including the details of the change (exactly what changes were made to the technical parameters for the scans), and the physicist review of impact on dose and image quality.

4.1.5A Incident Report/Adverse Events Policy – A policy for documentation of adverse events (i.e., contrast reactions, patient falls, emergencies) must be in place.

4.1.6A Patient Pregnancy Screening Policy – For all clinical procedures there must be a process that assures that patients who could be pregnant are identified. This must be documented and contain the signature/initials of the patient and/or technologist verifying the information. This procedure must include an explanation of the proper steps to be taken if a patient may be or is pregnant.

4.1.6.1A If a diagnostic CT examination is needed for a patient who is pregnant, knowledgeable staff (i.e., Medical Director or other designee) must discuss the potential risk to the fetus and document the general content of the discussion.

4.1.6.2A If determined that the study will not be performed, then the patient must receive options for alternative care.

4.1.7A Patient Pre-test Preparation Policy – There must be a policy in place for determining and administering any necessary pre-test preparations including:

4.1.7.1A education/instructions such as dietary or medication restrictions, examination specific preparation or other relevant information;

4.1.7.2A sufficient time must be allowed for adequate patient preparation; and

4.1.7.3A any other types of necessary pre-test preparation must be assessed prior to the start of the examination.

4.1.8A Contrast/Medication Administration and Supervision Policy

4.1.8.1A A CT facility providing CT procedures that require the administration of contrast, drug administration and/or exams requiring sedation, must have the following emergency supplies readily available:

i. posting of emergency phone number(s);
ii. an Automated External Defibrillator (AED) or a fully-equipped cardiac arrest cart (crash cart);
iii. equipment for starting and maintaining intravenous access;
iv. oxygen tank or wall-mounted oxygen sources with appropriate cannulae and/or masks; and
v. personnel trained and available to use the above emergency equipment.

4.1.8.2A The policy must address the steps taken to identify patients with documented or possible sensitivity to contrast and/or at increased risk for renal toxicity.

4.1.8.3A The policy must address medication and contrast administration procedures and the oversight of the contrast/medication administration and must include, but is not limited to:

i. IV access including location of insertion site and size of catheter;
ii. medications, including contrast, used in the procedure (i.e., beta blockers, conscious sedation);
iii. dosage, timing, route of administration;
iv. patient instruction;
v. patient monitoring;
vi. any precautions or restrictions needed;
vii. treatment of adverse reactions; and
viii. consent form (if required);

4.1.8.4A The Medical Director or delegated qualified personnel must administer medications and contrast and meet the Standards as listed in 1.6A to 1.6.4A.

(See Guidelines on Page 17 for further recommendations.)

Section 4A: Facility Safety Guidelines

4.1A Imminent life threatening situations may override the patient preparation and identification at the discretion of the treating physician.

4.1.1A Examples of patient-specific identifiers include the patient’s identification bracelet, hospital identification card, driver’s license, or asking the patient to state his or her full name or birth date avoiding procedures in which the patient can answer “yes” or “no.”

4.1.8A All facilities conducting contrast-enhanced studies should be equipped with remote infusion devices.

4.1.8.2A If contrast is used serum creatinine and BUN should be obtained if clinically indicated and the results reviewed prior to the CT examination.
Section 5A: Administrative

STANDARD – Patient Confidentiality

5.1A All facility personnel must ascribe to professional principles of patient-physician confidentiality as legally required by federal, state, local or institutional policy or regulation.

STANDARD – Patient or Other Customer Complaints

5.2A There must be a policy in place outlining the process for patients or other customers to issue a complaint/grievance in reference to the care/services they received at the facility and how the facility handles complaints/grievances.

STANDARD – Primary Source Verification

5.3A There must be a policy in place identifying how the facility verifies the medical education, training, appropriate licenses and certifications of all physicians as well as, the certification and training of all technical staff members and any other direct patient care providers.

Section 5A: Administrative Guidelines

Sample documents are available for each of the required policies listed in Section 5A on the IAC CT website at www.intersocietal.org/ct/seeking/sample_documents.htm.
Section 6A: Multiple Sites (Fixed and/or Mobile)

STANDARD – Multiple Sites

6.1A When testing is performed at more than one physical facility, the facility may be eligible to apply for a single accreditation as a multiple site facility if the following criteria are met:

6.1.1A all facilities have the same Medical Director;

6.1.2A all facilities have the same Technical Director;

6.1.3A all CT examinations are interpreted by medical staff included in the application;

6.1.4A all facilities utilize the same medical physicist or qualified expert;

6.1.5A all CT examinations are performed by technical staff included in the application; and

6.1.6A technical and interpretive quality assessment, as outlined in Section 2C: QI Measures must be evaluated for all CT testing sites.

Section 6A: Multiple Sites (Fixed and/or Mobile)

Guidelines

Facilities needing complete details on adding a multiple site should review the current IAC Policies and Procedures available on the IAC website at www.intersocietal.org/iac/legal/policies.htm.
Part B:
Examinations and Procedures

Section 1B: Instrumentation and Equipment

STANDARD – Instrumentation

1.1B All CT imaging devices in use must be appropriate for the organ systems being imaged, and must be FDA approved for the specific imaging task.

1.1.1B Equipment specifications and performance must meet all state, federal and local requirements, as well as the manufacturer’s published performance specifications and current standards of medical practice for the types of examinations performed.

1.1.2B The CT systems utilized for diagnostic studies must include, at a minimum, adequate hardware and software to perform and store organ specific procedures.

1.1.2.1B Coronary Calcium Scoring – CT scanners that will be used for coronary calcium scoring must meet the following minimum specifications:
   i. Electron Beam CT Systems
      • ≤ 100msec
   OR
   ii. Multi-detector CT Systems
      • 4 slice system or greater
      Comment: ≤ 0.5 sec rotation speed is recommended.

1.1.2.2B Coronary Computed Tomography Angiography (CTA) – CT scanners used for coronary arteries and coronary bypass grafts must meet the following minimum specifications:
   i. Multi-detector CT Systems
      • 64 slice system or greater
      • ≤ 0.5 sec rotation speed
      • Dual auto injector system

1.1.2.3B Vascular or Other CTA – CT scanners that will be used for CTA (abdomen; pelvis; chest (non coronary); neurovascular (including carotids); and peripheral vascular) and meet the following minimum specifications:
   i. Multi-detector CT Systems:
      • 16 slice system or greater is recommended
      • Automatic infusion injector system
      Comment: ≤ 0.5 sec rotation speed is recommended.
   ii. Electron Beam CT
1.1.2.4B **Neurological CT (excluding CTA)** – CT scanners that will be used for neurological imaging must meet the following minimum specifications:

i. Single or Multi-detector CT Systems

Comment: ≤ 0.5 sec rotation speed is recommended.

1.1.2.5B **Sinus and Temporal Bone CT** – CT scanners that will be used for dedicated sinus and temporal bone imaging must meet the following minimum specifications:

i. Volume or Cone Beam CT System

ii. Single or Multi-detector CT Systems

Comment: ≤ 2 sec rotation speed is recommended.

1.1.2.6B **Body CT (Chest, Abdomen, Pelvis, Extremities, excluding CTA)** – CT scanners that will be used for body imaging (excluding CTA), must meet the following minimum specifications:

i. Single, Electron Beam or Multi-detector CT Systems

Comment: ≤ 2 sec rotation speed is recommended.

1.1.3B The computer software and reconstruction systems used for CT procedures must be appropriate for the study performed and meet the following minimum specifications:

1.1.3.1B **Coronary Calcium Scoring:**

i. must be capable of providing a visual representation of coronary calcium exceeding protocol thresholds;

ii. must be capable of quantitating coronary calcium using Agatston, mass and/or volume scoring methodologies; and

iii. must be capable of providing user interaction with quantitative program to allow for selecting or de-selecting coronary calcifications based on visual inspection.

1.1.3.2B **Coronary CTA:**

i. must be capable of displaying data as Maximum Intensity Projection (MIP), thick or thin slices;

ii. must be able to display data as multi-planar reformat;

iii. must be able to display data in a curve plane reformat;

iv. must be able to present data in a three dimension format with the ability to display data rotated about all three axes;

v. must be able to extract relevant measurements as described in facility specific protocol;

vi. must be able to load simultaneously multiple phases; and

vii. must be able to perform quantification of coronary calcium.

1.1.3.3B **Vascular or Other CTA (Abdomen, Pelvis, Chest (non-coronary), Neurovascular (including carotids) and Peripheral Vascular):**

i. must be capable of displaying data as Maximum Intensity Projection (MIP), thick or thin slice;

ii. must be able to display data as multi-planar reformat data;

iii. ability to present data in a three dimension fashion to display data rotated about all three axes; and

iv. must be able to extract relevant measurements as described in the facility specific protocol.
1.1.3.4B Neurological CT (excluding CTA):
   i. must be capable of image processing appropriate to the imaging task.

1.1.3.5B Sinus and Temporal Bone CT:
   i. must be capable of image processing appropriate to the imaging task.

1.1.3.6B Body CT (Chest, Abdomen, Pelvis, Extremities, excluding CTA):
   i. must be capable of image processing appropriate to the imaging task.

1.1.4B For all systems:

1.1.4.1B all data are to be reviewed in a digital, on-screen medium;

1.1.4.2B monitor specifications must be sufficient to prevent any loss of resolution of CT images and to display the thinnest reconstructed images available;

1.1.4.3B must have capability to display data in standard contrast settings (lung field, bone, chest, etc.);

1.1.4.4B must have capability to adjust brightness and contrast settings manually;

1.1.4.5B datasets used for archiving must be DICOM compatible; and

1.1.4.6B must have the capability to optimize the field of view based on patient size and protocol implemented.

(See Guidelines on Page 24 for further recommendations.)

STANDARD – Equipment Quality Control

1.2B The Quality Improvement (QI) Program must consist of equipment quality control (QC) testing, CT system installation acceptance testing, and acceptance testing after a major upgrade to include: image quality, dose assessment and post installation shielding verification. (Refer to Physicist Guidance Document in Appendix)

1.2.1B Acceptance testing must include a comprehensive evaluation of the system components, the QC parameters included in 1.3B and 1.4B, image performance, and system performance as outlined in 21 CFR and applicable FDA guidance documents and performance of a radiation survey to verify the adequacy of installed lead shielding, if applicable.

1.2.2B The system parameters must be compared to the manufacturer’s system specifications and reviewed by the QI Committee and/or the Medical Director.

1.2.3B The medical physicist or qualified expert must perform the shielding design to ensure that occupational workers and members of the public are shielded according to NCRP Report 147, state regulation, or other equivalent industry standards.

1.2.3.1B This must be performed prior to installation of each new scanner.

1.2.3.2B A post installation survey must be performed by a medical physicist or qualified expert to verify the shielding.
1.2.4B Dose and image quality review of representative exams as compared to professional standards must be performed.

*(See Guidelines on Page 24 for further recommendations.)*

1.3B Routine (daily and periodic) QC tests are to be conducted according to performance measurements as outlined by the manufacturer. Federal standards require that CT manufacturers provide QC testing instructions, recommended testing frequency, a QC test phantom appropriate for the scanner and acceptable variations in parameter measurements.

1.3.1B Daily QC tests must include (where appropriate to the scanner):

1.3.1.1B mean CT number for water of representative components;
1.3.1.2B mean CT number of other reference material;
1.3.1.3B image noise;
1.3.1.4B artifact assessment; and
1.3.1.5B proper function of audible and visual patient safety equipment.

1.3.2B Periodic QC tests must include all from Section 1.3B and the following (where appropriate to the scanner):

1.3.2.1B spatial resolution for high and low contrast objects;
1.3.2.2B image uniformity;
1.3.2.3B slice thickness;
1.3.2.4B alignment light accuracy;
1.3.2.5B image display and storage devices; and
1.3.2.6B air calibration, if required.

1.4B Annual system performance measures must be evaluated using an appropriate phantom(s), determined by the medical physicist or qualified expert. *(Refer to Physicist Guidance Document in Appendix.)*

1.4.1B Annual system performance by a medical physicist or qualified expert must include the measurement and assessment of patient dose for representative examinations using CT dosimetry phantom(s) and instrumentation, in accordance with current professional standards and regulatory guidelines.

1.4.2B The annual system performance QC measures must include (where appropriate to the scanner):

1.4.2.1B contrast scale;
1.4.2.2B mean CT number of water and reference materials;
1.4.2.3B linearity;
1.4.2.4B internal and external laser light alignment;
1.4.2.5B gantry tilt (tilt gantry systems only);
1.4.2.6B slice localization;
1.4.2.7B table incrementation accuracy;
1.4.2.8B slice thickness;
1.4.2.9B image quality (as noted in 1.3B);
1.4.2.10B image display and storage devices; and
1.4.2.11B safety analysis including an inspection of audible and visual equipment.

1.5B The QI Committee and/or the Medical Director must evaluate the medical physicist or qualified expert’s recommendations for which quality control tests should be performed on the CT scanner and ancillary equipment, the frequency of the testing, and designate personnel to perform the test(s).

1.5.1B Preventive maintenance (PM) service is required per the manufacturers’ recommendations but not less than annually for each CT scanner at the facility.

(See Guidelines on Page 24 for further recommendations.)

STANDARD – Quality Control Documentation

1.6B All QC results must be documented and reviewed.

1.6.1B A written report of the acceptance tests must be maintained at the CT facility. The report must be signed and dated by the person performing the tests.

1.6.2B A complete log of PM, quality control tests and service records for all CT scanners and ancillary equipment must be maintained at the CT facility. The reports must be signed and dated by the person(s) performing the tests.

1.6.3B Results of all QC tests must be documented, archived and stored on film, in digital format, or on other suitable media according to state requirements if applicable.

(See Guidelines on Page 24 for further recommendations.)

Section 1B: Instrumentation and Equipment Guidelines

1.2B The CT site-appointed medical physicist or qualified expert should perform the acceptance testing.

1.1.4B If images are transmitted to another location for interpretation, the original resolution should be maintained.

1.5B Scanner ancillary equipment inspection (e.g., ECG gating, other monitoring equipment, injectors, processors, workstations, PACS, etc.) should also be included in the PM.

1.6B Quality control tests, standards, thresholds, timelines and results should be reviewed and discussed on a quarterly basis by the QI Committee and/or the Medical Director.
Section 2B: Protocols

STANDARD – Procedure Volumes

2.1B The annual procedure volume must be sufficient to maintain proficiency in examination performance and interpretation.

(See Guidelines on Page 27 for further recommendations.)

STANDARD – Indications, Ordering Process and Scheduling

2.2B CT testing is performed for appropriate indications.

2.2.1B Verification of the Indication – A process must be in place in the facility for obtaining and recording the indication. Before a CT study is performed, the indication must be verified and any additional information needed to direct the examination must be obtained.

Comment: For patients presenting with acute stroke symptoms refer to the Acute Stroke Appendix.

2.3B CT testing is appropriately ordered and scheduled.

2.3.1B Ordering Process – The CT order and requisition must clearly indicate the type of study to be performed, the reason(s) for the study and the clinical question(s) to be answered. The order/requisition must be present in the medical record of the patient.

2.3.2B Sufficient time for patient assessment, preparation and testing must be allotted for each study according to the procedure type.

STANDARD – Techniques

2.4B Examination performance must include proper technique.

2.4.1B All procedures must be explained to the patient and/or parents or guardian and informed consent obtained, if required.

2.4.2B Elements of examination performance include as appropriate, but are not limited to:

2.4.2.1B proper patient positioning;

2.4.2.2B optimization of image acquisition parameters inclusive of dose reduction techniques, if appropriate;

2.4.2.3B utilization of the appropriate protocol; and

2.4.2.4B appropriate protocol selection based on:

i. clinical diagnosis;
ii. patient age;
iii. body habitus/weight;
iv. surgical history;
v. patient clinical presentation; and
vi. contraindications.
2.4.3B The facility must have a complete, written description of each protocol that is being utilized for each CT examination and the protocol(s) must include (as appropriate):

2.4.3.1B indication for the study;

2.4.3.2B anatomical region(s) to be imaged;

2.4.3.3B utilization of the correct scanner for the indication;

2.4.3.4B clear criteria for deviating from protocols;

2.4.3.5B adherence to established practice guidelines (there may be allowance for exceptions if validated);

2.4.3.6B all orientations/views that will be displayed;

2.4.3.7B filming instructions to include window level and contrast settings, views, format, magnification;

2.4.3.8B reconstruction algorithm and filter;

2.4.3.9B reconstruction interval;

2.4.3.10B phase(s) of cardiac cycle reconstructed;

2.4.3.11B indication for IV contrast to include: type of contrast, amount, injection rate and scan delay protocol;

2.4.3.12B other medications used including dose and route of administration;

2.4.3.13B instruction on data archiving and transmission of images including what files are to be stored/transmitted; and

2.4.3.14B scanner settings or acquisition parameters to include (where appropriate to the scanner):

i. acquisition mode;

ii. patient orientation;

iii. KV;

iv. mA/mAs;

v. dose modulation, if used;

vi. collimation;

vii. rotation time;

viii. slice thickness;

ix. increment;

x. table speed/pitch;

xi. FOV;

xii. gantry angle; and

xiii. representative exposure or dose as recorded by the CT system.
Section 2B: Protocols
Guidelines

2.1B A facility should perform a minimum of 300 CT examinations annually. Each member of the medical staff should interpret a minimum of 300 CT examinations annually. Each member of the technical staff should perform a minimum of 300 CT examinations annually. The total volume of studies interpreted and performed by each staff member may be combined from sources other than the applicant facility. Lower volumes than those recommended here, however, should not dissuade a facility that is otherwise compliant with the IAC CT Standards from applying for accreditation.
Part C: Quality Improvement

Section 1C: Quality Improvement Program

STANDARD – QI Program

1.1C A Quality Improvement (QI) Program must be in place in the CT facility.

1.1.1C QI procedures must be designed to provide a standard of measurement of the technical and interpretive components of facility performance and the documentation of any variance thereof. A QI Committee and/or the Medical Director must provide oversight to these procedures.

1.1.2C The use of a site appointed medical physicist or qualified expert is required for an annual survey to include: image quality evaluation, representative patient dose assessment and for oversight of the QI Program.

(See Guidelines on Page 28 for further recommendations.)

STANDARD – QI Documentation

1.2C QI documentation (policies, reports, records, etc.) must be maintained at the CT facility and made available to all personnel.

1.2.1C QI Record Keeping

1.2.1.1C Records must be maintained of the QI process.

1.2.1.2C The records must include a description of how the information is used to improve quality in the CT facility.

(See Guidelines on Page 28 for further recommendations.)

Section 1C: Quality Improvement Program Guidelines

1.1C The QI Committee should, at minimum, consist of the Technical Director, Medical Director, service engineer and/or site-appointed medical physicist.

The QI Program should also include a process for evaluating indicators such as backlog for scheduled examinations, late reporting, long patient waiting times and utilization review.

1.2C QI records should include, but not be limited to, image quality evaluation, dose assessment, peer review, correlation data and information gained from the areas outlined in Section 2C.
Section 2C: Quality Improvement Measures

STANDARD – QI Measures

2.1C The QI Program must include:

(See Guidelines on Page 30 for further recommendations.)

2.1.1C Technical Quality Assessment – Under the supervision of the Medical Director and the Technical Director, and with the guidance of the Medical Physicist or qualified expert, the facility must have a defined QI program that evaluates the ongoing technical quality and radiation dose information (i.e., Computed Tomography Dose Index (CTDI), Dose Length Product (DLP)), of the CT procedures performed in the facility.

2.1.1.1C Each facility must document the available dose reduction techniques and clinical indications/contraindications for their use.

2.1.1.2C Technical indicators must include, but are not limited to:

i. image quality (i.e., field of view; contrast enhancement; artifacts; extent of coverage; adherence to protocol); and

ii. documentation of dosimetry data ranges (DLP; CTDIvol or dose (mGy) per sequence or cumulative per examination) for protocols used in the facility based on patient age and habitus.

2.1.1.3C Radiation dose review and assessment (patients and staff) must be included in the program.

2.1.1.4C Thresholds are determined for each indicator.

(See Guidelines on Page 30 for further recommendations.)

2.1.2C Interpretive Quality Assessment – Under the supervision of the Medical Director, the facility must have a defined QI Program that evaluates the ongoing quality of the interpretation of the CT examinations.

2.1.2.1C Correlation and Confirmation of Results: For those patients who have undergone cardiac CT examinations and other diagnostic procedures (such as cardiac catheterization, invasive angiography, nuclear perfusion examinations or other diagnostic imaging) or surgical intervention, the results of CT examination and other procedures must be routinely compared. A process for reviewing variations between CT examination results and results of other procedures must be in place.

(See Guidelines on Page 30 for further recommendations.)
Section 2C: Quality Improvement Measures Guidelines

2.1C Appropriate Use Criteria (AUC): As part of the ongoing QI Program, facilities providing computed tomography should incorporate the measurement of the appropriate use of this diagnostic imaging examination based on criteria published and/or endorsed by professional medical organization(s).

- Overall results should be documented. The percentage of appropriate, inappropriate and uncertain indications for testing should be measured.
- A program for education and reporting should be developed and may include but is not limited to:
  - Patterns of adherence to AUC
  - Baseline rates of adherence
  - Goals for improvement of adherence to appropriate use criteria
  - Measurement of improvement rate
  - Confidential comparison reports on patterns of adherence in aggregate by ordering physician, ordering practice, and interpreting practice.

2.1.1C Technical Quality Assessment: The program should have predefined indicators of technical quality and predefined thresholds that indicate the need for corrective action. The facility should maintain reports of quality assessment evaluations and corrective actions taken. Technical indicators may include, but not limited to:

- Adverse effects (i.e., contrast reactions, repeat exams, patient incidents)
- Reproducibility of image quality and computer processing (i.e., reformats; electronic transfers)

2.1.3C Interpretive Quality Assessment: This program should have predefined indicators of quality and predefined thresholds that indicate the need for corrective action. The Medical Director should maintain reports, as necessary, of quality assessment evaluations and document, if applicable, corrective measures taken.

- Peer review: Intermittent peer review of both the performance and interpretation of examinations should be performed to determine the quality, accuracy and appropriateness of the examination. Peer review may also be used to compare reproducibility of interpretation with previous interpretation, or with interpretation of the same study by other qualified interpreting physicians. Both physicians and technologists should be involved in the peer review process in order to achieve standardized protocols and reporting. Results of peer review should be discussed in an appropriate manner to assure correction of negative results as well as to preserve physician, technologist and patient confidentiality. (Strict attention must be paid to physician, staff and patient confidentiality as required by federal, state, local or institutional policy or regulation).
Section 3C: Quality Improvement Meetings

STANDARD – QI Meetings

3.1C Quality Improvement (QI) meetings must be documented.

3.1.1C QI Review and Documentation – The results of the technical and interpretive quality assessments must be reviewed and disseminated to the medical and technical staff at a minimum of two times per year.
Bibliography


6. American Association of Physicists in Medicine report No.3. Assessment of display for medical imaging systems. Website: www.aapm.org/pubs/reports/OR_03.pdf


15. International Commission on Radiation Protection (ICRP) Report 87. CT Dose Management. Website: www.icrp.org/docs/ICRP_87_CT_s.pps


Appendix

Table 3. Requirements for CCT Study Performance and Interpretation to Achieve Level 1, 2, and 3 Clinical Competence

<table>
<thead>
<tr>
<th>Level</th>
<th>Cumulative Duration of Training</th>
<th>Minimum Number of Mentored Examinations Performed</th>
<th>Minimum Number of Mentored Examinations Interpreted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>4 weeks*</td>
<td>—</td>
<td>50‡</td>
</tr>
<tr>
<td>Level 2—non-contrast</td>
<td>4 weeks*</td>
<td>50</td>
<td>150‡</td>
</tr>
<tr>
<td>Level 2—contrast</td>
<td>8 weeks*</td>
<td>50</td>
<td>150‡</td>
</tr>
<tr>
<td>Level 3</td>
<td>6 months*</td>
<td>100</td>
<td>300‡</td>
</tr>
</tbody>
</table>

*This represents cumulative time spent interpreting, performing, and learning about CCT, and need not be a consecutive block of time, but at least 30% of the time should represent supervised laboratory experience. In-lab training time is defined as a minimum of 35 h/weeks. The case load recommendations may include studies from an established teaching file, previous CCT cases, journals and/or textbooks, or electronic/on-line courses/CME.

Table 5. Documentation and Maintenance of Clinical Competence in CCT

<table>
<thead>
<tr>
<th>Documentation of Competence</th>
<th>Training Guidelines</th>
<th>Proof of Competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training completed after July 1, 2008</td>
<td>Level 2 or Level 3 training as outlined</td>
<td>Letter of certification from training supervisor OR letter attesting to competence from Level 2- or 3-trained physician</td>
</tr>
<tr>
<td>Training completed before July 1, 2008</td>
<td>Level 2 training OR interpretation of at least 150 studies (in which 50 where the candidate is physically present, involved in the acquisition and interpretation of the case) and attendance in at least 20 h of devoted CCT classes Level 3 training OR interpretation of at least 300 studies (in which 100 where the candidate is physically present, involved in the acquisition and interpretation of the case) and attendance in at least 40 h of classes devoted to CCT</td>
<td></td>
</tr>
</tbody>
</table>

Maintenance of competence | Contrast CCT examinations per year be performed and interpreted: Level 2: 50 Level 3: 100 |
Acute Stroke Appendix

Requirements for Emergent CT Studies for Patients Presenting With Acute Stroke Symptoms

The following criteria are required for those facilities performing CT studies for patients presenting with acute stroke symptoms:

1. Qualified board certified physicians are required to interpret the study.

2. A written procedure must be available outlining the identification of these emergent CT studies (i.e., code stroke) on the study request so that a timely interpretation is done.

3. A written preliminary report of the CT head should be sent to the treating physician within 45 minutes of the patient’s arrival to the facility. Alternatively, a direct verbal report to the treating physician can be done within 45 minutes of the patient’s arrival to the facility with a follow up written preliminary report documenting the time of this verbal report exchange. A goal of reading the CT head within 15 minutes of the completion of the study is recommended. If the interpreting and treating physician is the same, a preliminary written report should be noted within the medical record.

4. The written preliminary report should include comments on major CT head findings (at a minimum, presence or absence of hemorrhage, mass lesion, or acute infarction must be mentioned) as well as whether this study fulfills neurological imaging criteria for inclusion or exclusion of acute stroke therapies based on available published neurological imaging guidelines.

5. The physician providing the preliminary interpretation must be the same person providing the final official interpretation of the CT study.

6. When the CT interpreter and the treating physician are different individuals who both render written opinions regarding neurological imaging criteria for inclusion or exclusion of acute stroke therapies, the CT facility must track this information as a part of quality improvement.

7. The final CT interpretation must conform to available published acute stroke neurological imaging guidelines (at a minimum for head CT’s, presence or absence of hemorrhage, mass lesion, or acute infarction must be mentioned and the inclusion or exclusion of acute stroke therapies based on neurological imaging criteria).

8. The final CT study interpretation must be dictated within 24 hours of completion of the study.

** The above guidelines are applicable to any CT study used to guide emergent treatment decisions.
Acute Stroke Bibliography


Medical Physicist or Qualified
Expert Report Guidance Document

IAC CT Guidance for Radiation Protection Survey, Image Quality and Dose Assessment

1. Radiation Protection Surveys (RPS) must be performed upon installation of new equipment, or after major changes in room configuration, equipment location, or usage of areas adjacent to the CT scanner. These are typically done upon acceptance, and are not required annually thereafter. Hence, it may be necessary to locate the original acceptance test report of the CT scanner to find the RPS. IAC CT requires that a RPS be submitted, to demonstrate that the safety of the installation and the surrounding areas has been assessed. A complete RPS must include:

a. A sketch showing the layout of the equipment in the room, and identifying the surrounding areas (e.g., toilet, corridor, outside wall, exam room, office, etc.).

b. Measurements of exposure (or exposure rate) obtained with an appropriately sensitive radiation measurement system.

c. Calculations to demonstrate compliance with weekly or annual exposure limits, which must include a determination of workload, identification of occupancy of each adjacent area, and identification of the applicable exposure limit (controlled and non-controlled areas).

d. Note that shielding designs are not required to be submitted.

2. CT Dosimetry Reports for all scanners, including volume CT (VCT) or cone-beam CT (CBCT) scanners, must include:

a. Measurements of exposure, and calculations of dose or dose index (or other appropriate dosimetry metric) which include comparison with some applicable reference standard, using the same units as the reference standard. The report must be clear about whether the results are acceptable, and identify corrective actions if the results are not acceptable.

b. Dosimetry should be in units of pitch-corrected CTDI, point dose at the central ray, or MSAD for typical clinical protocols. The clinical protocol factors must be listed.

c. Although CTDI is not rigorously defined for VCT or CBCT scanners, CTDI is also not rigorously defined for multislice CT scanner with beam thickness more than 1.0 cm. While imperfect, CTDI is the only metric for which reference standards currently exist. If possible, VCT or CBCT systems should be configured to use a z-axis collimation that is less than the length of the pencil chamber (if such a chamber is used). For example, temporal bone imaging protocols found on ENT scanners often meet this criterion. As new techniques for CT dosimetry are published, more rigorous methods should be used.

d. The report must identify the phantom and radiation detection system used.
1. Report must be signed and dated by the medical physicist or qualified expert:

   IAC CT Standards for medical physicist or qualified expert:
   Board certified medical physicist or qualified expert.
   Is the medical physicist or qualified expert licensed by the state or otherwise authorized to perform dose measurements and evaluate CT image quality?

2. Report must indicate if acceptance test

3. Report must indicate if annual survey

4. Report must document recommended corrective actions

5. Dose report to include:
   a. Dose reported for typical clinical protocols
   b. Comparison of measured dose with some reference standard, using the same dose units. Report must include if results acceptable.
   c. Dose should be in units of pitch corrected CTDI (preferably) or point dose at the central ray for cone-beam systems or MSAD.(or IAC approved acceptable methodology)
   d. The ion chamber/electrometer manufacturer/model must be documented
   e. Phantom used for dose analysis must be documented on report.

6. Image quality report to include:
   a. Low-contrast resolution (n/a cone beam CT)
   b. High-contrast spatial resolution
   c. Reconstructed slice thickness accuracy (n/a cone beam CT)
   d. Alignment of laser light (if available on system)
   e. CT number accuracy
   f. Noise (not CBCT)
   g. Are parameters compared with a reference standard or manufacturer’s specification? (Some may be N/A.)
   h. QC phantom for quality analysis must be documented on the report

7. Confirmation of Shielding Plan or completion at installation:
   The Radiation Protection Survey at installation should include:
   a. Layout showing equipment location in the room and type of occupancy for adjacent areas (i.e., office, toilet, outside, corridor, etc.)
   b. Exposure (mR, mSV or uR, uSV) or exposure rate (mR/hr or mSv/hr) measurements at multiple locations including at least the

---

IAC CT Standards Reference
Section 1.2B – 1.6B

Refer to Standard 1.4B

Refer to page 36

Refer to Standard 1.2B
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>operator position and areas adjacent to (but outside of) the scanner room. Measurements outside may be omitted under some situations.</td>
<td></td>
</tr>
<tr>
<td>c. Determination of weekly workload (mAs per scan x # patients per week) or some other accept methodology</td>
<td></td>
</tr>
<tr>
<td>d. Occupancy factors specified for surrounding areas</td>
<td></td>
</tr>
<tr>
<td>e. Calculation weekly exposure to persons inside and outside the room, corrected for occupancy factor</td>
<td></td>
</tr>
<tr>
<td>f. Final assessment of results as “Acceptable,” “ALARA,” within restricted vs. unrestricted guidelines</td>
<td></td>
</tr>
<tr>
<td>g. Report is signed and dated by the qualified medical physicist</td>
<td></td>
</tr>
<tr>
<td>h. Recommendations, actions needed, or issues to be addressed to the facility must be included on the report, if applicable</td>
<td></td>
</tr>
<tr>
<td>Comment: The IAC CT accreditation program outlines the training and experience requirements that the medical physicist/qualified expert must meet in order to perform CT quality assurance testing. The analysis and evaluation of the quality control testing is left to the judgment of the qualified medical physicist. The primary purpose of the submission of the phantom images with the results is to verify/document the image quality analysis.</td>
<td></td>
</tr>
</tbody>
</table>