The Complete

IAC CT Standards for Dental/Maxillofacial Computed Tomography (CT) Practice Accreditation Using Cone Beam Technology

Parts I and II
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Introduction

The IAC Dental CT Standards lists the requirements and recommendations for the dental practice and/or dental specialty practice performing diagnostic and/or treatment planning maxillofacial computed tomography (CT) examinations using a cone beam CT system. For any practice using a conventional CT system, accreditation may be obtained through the non-dental IAC CT program at [www.intersocietal.org/ct/main/ct_standards.htm](http://www.intersocietal.org/ct/main/ct_standards.htm).

All absolute requirements appear in bolded text. A dental facility, dental practice or dental specialty practice is defined as any dental institution or practice setting or hospital that provides diagnostic and/or treatment planning maxillofacial CT services.

In addition to all standards listed below, the practice and the Dental or Medical Director 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.
Part I:
Organization

Section 1:
Personnel and Supervision

STANDARD – Dental or Medical Director(s)

1.1 The Dental or Medical Director must be a licensed dentist or specialty dentist, board certified in a dental specialty recognized by the American Dental Association (ADA) or by the Royal College of Dentists of Canada, or a licensed physician 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 Medicins du Quebec.

1.1.1 Dental or Medical Director required training and experience:
The Dental or Medical Director must have a license in good standing from one or more United States or Canadian Board of Dentistry or Medicine and meet at least one of the following criteria:

1.1.1.1 Formal training
   a. Completion of a residency in a dental specialty that included advanced radiology /imaging training as part of the curriculum approved by the ADA Commission on Dental Accreditation (CODA) or the Commission on Dental Accreditation of Canada (CDAC), with a letter from the program director.

   OR

   b. Board certified by an ADA-Recognized Dental Specialty Certifying Board that includes advanced radiology/imaging training and is recognized by CODA or CDAC.

   OR

   c. Board certified (or Board eligible but within two years of finishing training) in a medical specialty recognized by the American Board of Medical Specialties, American Osteopathic Association, Royal College of Physicians and Surgeons of Canada or Le College des Medicins du Quebec Board certified (or Board eligible but within two years of finishing training) and completion of a minimum of a four-month formal training program in CT and/or at least one year (full-time equivalent) of CT experience with independent interpretation of at least 150 maxillofacial CT studies.

   OR

1.1.1.2 Informal training
   a. Documented interpretation of at least 150 mentored* maxillofacial CT examinations

   AND

   b. Attendance in at least 20 hours of CT training with a letter of verification from the program director. Such training should be certified for ADA Continuing Education
Recognition Program (CERP), and/or Academy of General Dentistry (AGD) Program Approval for Continuing Education (PACE), and/or Category I continuing medical education credit. The 20 hours of CT training must include at least 3 hours of relevant radiation safety instruction provided by a medical physicist or qualified expert and must be validated by a 100% score on a written examination administered by the course provider.

*The case load recommendation may include studies from established teaching files or electronic online CE courses that include a post test or course competency.

OR

1.1.3 Established practice

a. A dentist, specialty dentist or physician, who has been interpreting CT studies for at least three years.

AND

b. Has acquired 50 hours ADA CERP and/or AGD PACE continuing dental education and/or Category I medical education (at least 15 hours of the CE must be CT training and include at least 3 hours of relevant radiation safety instruction by a medical physicist or qualified expert and must be validated by a 100% score on a written examination administered by the course provider.)

AND

c. Has interpreted a minimum of 150 documented maxillofacial CT examinations with self attestation.

AND for all pathways (other than for a radiology interpreting physician) listed above (1.1.1.1; 1.1.1.2; 1.1.1.3): At least four (4) hours of documented, manufacturer training in the operation of the CT scanner and a minimum of three (3) hours of radiation safety training.

1.1.2 Dental or Medical Director responsibilities:

1.1.2.1 The Dental or Medical Director is responsible for all clinical services provided and for the determination of the quality and appropriateness of care provided.

a. The Dental or Medical Director may supervise the entire operation of the dental practice or may delegate specific operations to associate Dental or Medical Directors or dental or medical staff.

b. The Dental or Medical Director is responsible for assuring compliance of the dental or medical and technical staff to the standards outlined in this document and the supervision of their work.

c. The Dental or Medical Director must be an active participant in the interpretation of CT examinations performed in the practice. If not generating final reports, the Dental or Medical Director must provide documentation of review and acceptance, or amendment of findings.

d. The Dental or Medical Director, in consultation with the medical physicist and/or qualified expert, may delegate the operation of the CT scanner to a dental specialist or dentist or qualified physician, as outlined in 1.2 based on potential dose to the patient and technical complexity of the CT system as long
as the state permits physicians and dentists to operate x-ray producing equipment.

c. The Dental or Medical Director is responsible for overseeing technical staff.

1.1.3 Continuing Education (CE) requirements for reaccreditation:

1.1.3.1 The Dental or Medical Director must document at least 15 hours of ADA continuing dental and/or Category I continuing medical education credits in maxillofacial CT over a period of three years.

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

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

Comment: If the Dental or Medical Director has completed training or certification, as specified under 1.1.1.1 in the past three years, the CE requirement will be considered fulfilled.

STANDARD – Dental or Medical Staff

1.2 The dental or medical staff must have a license in good standing from one or more United States or Canadian Board of Dentistry or Medicine and meet at least one of the following criteria:

1.2.1 Dental or medical staff required training and experience:

1.2.1.1 Formal training

a. Completion of a residency in a dental specialty that included advanced radiology/imaging training and radiation safety as part of the curriculum approved by ADA Commission on Dental Accreditation (CODA) or Commission on Dental Accreditation of Canada (CDAC), with a letter from the program director.

OR

b. Board certified by an ADA-Recognized Dental Specialty Certifying Board that includes advanced radiology/imaging training and radiation safety and is recognized by CODA or CDAC.

OR

c. Board certified (or Board eligible but within two years of finishing training) in a medical specialty recognized by the American Board of Medical Specialties, American Osteopathic Association, Royal College of Physicians and Surgeons of Canada or Le College des Medicins du Quebec Board certified (or Board eligible but within two years of finishing training) and completion of a minimum of a 4-month formal training program with radiation safety training as part of the curriculum in CT and/or at least one year (full time equivalent) of CT experience with independent interpretation of at least 150 maxillofacial CT studies.

OR

1.2.1.2 Informal training

a. Documented interpretation of at least 150 mentored* maxillofacial CT examinations.
AND

b. Attendance in at least 20 hours of CT training with a letter of verification from the program director. Such training should be certified for ADA Continuing Education Recognition Program (CERP), and/or AGD Program Approval for Continuing Education (PACE), and/or Category I continuing medical education credit. The 20 hours of CT training must include at least 3 hours of relevant radiation safety instruction provided by a medical physicist or qualified expert and must be validated by a 100% score on a written examination administered by the course provider.

*The case load recommendation may include studies from established teaching files or electronic online CE courses that include a post test or course competency.

OR

1.2.1.3 Established practice

a. A dentist, specialty dentist or physician, who has been interpreting CT studies for at least three years.

AND

b. Has acquired 50 hours ADA CERP and/or AGD PACE continuing dental education and/or Category I medical education (at least 15 hours of the CE must be CT training and include at least 3 hours of relevant radiation safety instruction by a medical physicist or qualified expert and must be validated by a 100% score on a written examination administered by the course provider).

AND

c. Has interpreted a minimum of 150 documented maxillofacial CT examinations with self attestation.

AND for all pathways listed above (1.2.1.1; 1.2.1.2; 1.2.1.3) other than radiology interpreting physicians: At least four (4) hours of documented, manufacturer training in the operation of the CT scanner and a minimum of three (3) hours of radiation safety training.

1.2.2 Dental or medical staff responsibilities:

1.2.2.1 The dental or medical staff interprets and/or performs diagnostic and/or treatment planning CT examinations in compliance with the requirements established by the Dental Medical Director. If not generating final reports, the dental medical staff member must provide documentation of review and acceptance or amendment of findings.

1.2.3 Continuing Education (CE) requirements for reaccreditation:

1.2.3.1 The Dental or Medical Director must document at least 15 hours of ADA CERP or AGD PACE continuing dental and/or Category I medical education credits in maxillofacial CT over a period of three years.

1.2.3.2 A minimum of three hours of the documented 15 hours of CE must be related to radiation safety.
1.2.3.3 Yearly accumulated continuing education must be kept on file and available to the IAC CT, when requested.

Comment: If the Dental or Medical staff member has completed training or certification, as specified under 1.2.1.1 in the past three years, the CME requirement will be considered fulfilled.

STANDARD – Technical Staff

1.3 The technical staff must have appropriate training, technical certification as noted below and documented experience in the use of dental/maxillofacial CT using a cone beam scanner.

1.3.1 Technical staff required training and experience

The technical staff must meet ONE of the following criteria:

1.3.1.1 A state licensed dentist or specialty dentist, board certified in a dental specialty recognized by the American Dental Association (ADA) or by the Royal College of Dentists of Canada, or a licensed physician Board certified (or Board eligible but within two years of finishing training) in a medical specialty recognized by the American Board of Medical Specialties, American Osteopathic Association, Royal College of Physicians and Surgeons of Canada or Le College des Medicins du Quebec.

OR

1.3.1.2 A licensed dental hygienist with radiation safety training as part of the curriculum.

OR

1.3.1.3 A dental assistant state licensed or authorized by the state radiation control/protection department and in compliance with the state dental board regulations.

OR

1.3.1.4 A radiologic technologist with certification by the American Registry of Radiologic Technologists (ARRT), or the Canadian Association of Medical Radiation Technologists (CAMRT) (i.e., RT).

a. AND for all pathways listed above (1.3.1.1; 1.3.1.2; 1.3.1.3; 1.3.1.4):

- At least three (3) hours of documented, specific training in radiation safety relevant to CT testing. This may be provided by an accredited dental training program or by a medical physicist/qualified expert. A 100% score on a written examination administered by the provider of the radiation safety training program must be obtained.

AND

- Received at least four (4) hours of documented, manufacturer training in the operation of each CT scanning system employed.

1.3.2 Technical staff responsibilities:

1.3.2.1 The technical staff member(s) reports to the Dental or Medical Director.
1.3.2.2 The technical staff member(s) assumes the responsibilities specified by the Dental or Medical Director and, in general, is responsible for the performance of clinical CT examinations and other tasks assigned.

1.3.3 Continuing Education requirements for reaccreditation:

1.3.3.1 The technical staff member must document at least 15 hours of ADA CERP or AGD PACE continuing dental education credits, Category 1 Medical continuing education credit, or ARRT Category A continuing education credit half of which must be relevant to dental/maxillofacial CT or dental imaging over a period of three years.

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

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

Comment: If the technical staff member has completed training or certification, as specified under 1.1.1.1 in the past three years, the CE requirement will be considered fulfilled.

STANDARD – Medical Physicist or Qualified Expert

1.4 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. 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.

1.4.1 Other personnel, deemed by the medical physicist as competent to perform the assigned tasks, may assist the medical physicist or qualified expert in the collection of data.

1.4.2 Continuing Education (CE) requirements:

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

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

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

STANDARD – Support Services

1.5 Ancillary personnel (i.e., clerical, clinical, etc.) necessary for safe and efficient patient care are provided.

1.5.1 Supervision:

1.5.1.1 The Dental or Medical Director must ensure that appropriate support services are provided in the best interest of patient care.
1.5.2 **Support Services:**

1.5.2.1 *Clerical and administrative support must be sufficient to ensure efficient operation and record keeping.*

1.5.2.2 *The use of a qualified medical physicist or qualified expert is encouraged for initial acceptance testing, to establish and monitor the quality control program and radiation safety policies and procedures.*

**STANDARD – Primary Source Verification**

1.6 *There must be a policy in place identifying how the laboratory/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 2:
Physical Facilities

STANDARD – Examination Areas

2.1 Diagnostic and/or treatment planning maxillofacial CT examinations must be performed in a setting providing patient and technical staff safety, comfort and privacy.

2.1.1 The adequate performance of a diagnostic and/or treatment planning maxillofacial CT examination requires the proper positioning of the patient. For this reason, adequate spacing is required for inclusion of a cone beam CT imaging system and patient privacy.

2.1.1.1 Patient privacy should be assured with the use of appropriate curtains or doors and must be in compliance with state regulations.

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

2.1.1.3 Direct visualization and audible monitoring of the patient should be available while protecting personnel from radiation exposure.

2.1.1.4 The medical physicist or qualified expert must assess the safety at installation and the facility is responsible for implementing the medical physicist or qualified expert’s recommendations to keep exposures as low as reasonably achievable (ALARA).
Section 3: Examination Data Archiving, Examination Reports and Dental Practice CT Records

STANDARD – CT Examination Data

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

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

3.1.2 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.

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

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

3.2.1 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 dentist or physician as quickly as clinically indicated. A record of the communication should be maintained.

3.2.2 If preliminary results are provided by an interpreting dentist or physician, the final report should be generated within two working days. A mechanism for communicating any significant changes must be defined for those situations in which the final interpretation differs significantly from the preliminary report.

3.2.3 CT examinations must be interpreted and reported by the Dental or Medical Director or by a member of the dental or medical staff of the CT dental practice.

3.2.3.1 Final dentist or 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. The final verified, signed report must be available in a timely fashion, generally within four working days.
Section 4: Dental Practice Safety and Patient Confidentiality

STANDARD – Dental Practice Safety

4.1  Patient and employee safety is ensured by written policies and procedures, approved by the Dental or Medical Director.

4.1.1  Radiation dose for CT acquisition should be set at the lowest values that are consistent with satisfactory image quality for the study ordered.

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

4.1.3  The dental practice must have a written procedure in place for handling acute medical emergencies.

4.1.4  The dental practice should comply with the currently published ALARA recommendations for personnel and subscribe to dose optimization for patients. The use of higher than recommended radiation doses must be justified. For pediatric patients, protocols must be modified to reduce radiation exposure, where appropriate or possible.

4.1.5  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.

4.1.6  Staff radiation exposure must be monitored per state requirements and reviewed by the quality assurance (QA) Committee. The results must be communicated to the staff member.

4.1.7  There must be restriction of the public to radiation areas.

4.1.8  A policy for documentation of adverse events (i.e., falls, injuries, complaints) must be in place.

STANDARD – Patient Confidentiality

4.2  All dental practice personnel must ascribe to professional principles of patient-dentist/physician confidentiality, as legally required by federal, state, local or institutional policy or regulation.

STANDARD – Patient or Other Customer Complaints

4.3  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 laboratory/facility and how the facility handles complaints/grievances.
Section 5: Multiple Sites (Fixed and/or Mobile)

STANDARD – Multiple Sites

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

5.1.1 All facilities have the same Dental or Medical Director.

5.1.2 All CT examinations are interpreted by dental or medical staff included in the application.

5.1.3 All dental practices utilize the same medical physicist or qualified expert.

5.1.4 All CT examinations are performed by dental technical staff included in the application.

5.1.5 Technical and interpretive quality assessment, as outlined in Part II, Section 7, must be evaluated for all CT testing sites.
Part II:
CT TESTING

Section 1: Instrumentation

STANDARD – Instrumentation

1.1 All cone beam CT imaging devices in use must be appropriate for the maxillofacial region being imaged, and must be FDA approved for the specific imaging task.

1.2 The cone beam CT 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 and/or dental practice for maxillofacial examinations performed.

1.3 The cone beam CT systems utilized for maxillofacial diagnostic and/or treatment planning studies must include, at a minimum, adequate hardware and software to perform and store all maxillofacial examinations.

1.4 The computer software and reconstruction systems used for cone beam CT maxillofacial examinations must be appropriate for the study performed and must be capable of image processing appropriate to the imaging task.

1.5 For all cone beam systems:

1.5.1 All data are to be reviewed in a digital, on-screen medium.

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

1.5.3 Monitor specifications must be sufficient to prevent any loss of resolution of CT images and to display the thinnest reconstructed images available.

1.5.4 Must have capability to display data in standard contrast/scale settings.

1.5.5 Must have capability to adjust brightness and contrast settings manually.

1.5.6 Datasets used for archiving must be DICOM compatible.

1.5.7 Should have the capability to optimize the field of view based on the anatomy of interest.
Section 2: Instrument Quality Assurance

STANDARD – Quality Assurance (QA)

2.1 There must be a written comprehensive quality assurance program to provide a standard of measurement for cone beam CT system performance and the documentation of any variance thereof. A Quality Assurance Committee and or the Dental or Medical Director must provide oversight to these procedures.

2.1.1 The Quality Assurance Committee should, at minimum, consist of the Dental or Medical Director, service engineer and/or site-appointed medical physicist. The use of a site appointed medical physicist or qualified expert is required for an annual survey of the scanner image quality and patient dose, and for oversight of the quality control (QC) program.

2.1.2 Quality control (QC) tests, standards, thresholds, timelines and results should be reviewed and discussed on a quarterly basis by the Quality Assurance Committee and or the Dental or Medical Director. 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.

2.2 The quality assurance program must consist of cone beam CT system installation acceptance testing and major upgrade acceptance testing.

2.2.1 Acceptance testing must include a comprehensive evaluation of the system components, the QC parameters included in sections 2.3 and 2.4, 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.

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

2.2.3 The system parameters must be compared to the manufacturer’s system specifications and reviewed by the Quality Assurance Committee and or the Dental or Medical Director.

2.2.4 A written report of the acceptance tests must be maintained at the CT dental practice. The report must be signed and dated by the person performing the tests.

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

2.2.6 Patient dose measurements and image quality assessment of representative exams as compared to professional standards must be performed.

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

2.3.1 Daily quality control tests should include, at a minimum:

2.3.1.1 Mean CT number for water of representative components;

2.3.1.2 Mean CT number of other reference material;

2.3.1.3 Image noise;
2.3.1.4 Artifact assessment;

2.3.1.5 Proper function of audible and visual patient safety equipment.

2.3.2 Periodic quality assurance tests should include all from Section 2.3.1 and:

2.3.2.1 Spatial resolution for high and low contrast objects;

2.3.2.2 Image uniformity;

2.3.2.3 Image display and storage devices;

2.3.2.4 Air calibration, if required.

2.4 Annual system performance measures must be evaluated using an appropriate phantom(s), determined by the medical physicist or qualified expert. The QC tests performed should include (as appropriate to the scanner) and will be required for any mid-cycle audits/site visits and at reaccreditation:

2.4.1 Contrast scale;

2.4.2 Mean CT number of water and reference materials;

2.4.3 Linearity;

2.4.4 Slice thickness;

2.4.5 Image quality as noted in 2.3;

2.4.6 Image display and storage devices;

2.4.7 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;

2.4.8 Safety analysis including an inspection of audible and visual equipment.

2.5 The Quality Assurance Committee and/or the Dental or Medical Director must evaluate the medical physicist or qualified expert’s recommendations and determine the quality control tests to be performed on the CT scanner and ancillary equipment, the frequency of the testing, and designate personnel to perform the test(s). Any corrective actions recommended by the medical physicist or qualified expert must be reviewed by the QC committee and/or the Dental or Medical Director. If corrective actions are performed by the dental facility they must be reviewed and documented in the QC Committee minutes.

2.5.1 Preventive maintenance (PM) service is required per the manufacturers’ recommendations. If there are no manufacturer recommendations, PMs should be performed at least annually for each CT scanner at the dental practice.

2.5.2 Scanner ancillary equipment inspection (i.e., workstations, PACS, etc.) should also be included in the PM.

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

2.6 All QC and QA results must be documented.

2.6.1 Quality assurance documentation (policies, reports, records, etc.) must be maintained at the CT dental practice and made available to all personnel.
Section 3: Indications, Ordering Process, Scheduling and Patient Identification

STANDARD – Indications

3.1 CT testing is performed for appropriate indications.

3.1.1 Verification of the indication: A process must be in place in the dental practice 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.

STANDARD – Ordering Process and Scheduling

3.2 CT testing is appropriately ordered and scheduled.

3.2.1 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 treatment plan or clinical question(s) to be answered. The order/requisition must be present in the medical record of the patient.

3.2.2 Sufficient time for patient assessment and testing must be allotted.

STANDARD – Patient Identification

3.3 Patient identification – For all clinical procedures there must be a process that assures accurate patient identification prior to initiating the procedure. It is preferable that this be done using at least two pieces of information that are provided by the patient and compared with existing documents.

3.4 Pregnancy screening – For all clinical procedures there must be a process that assures that patients who could be pregnant are identified. This must be documented and should contain the signature initials of the patient and/or technical staff member verifying the information. This procedure must include an explanation of the proper steps to be taken if a patient may be or is pregnant.

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

3.4.2 If determined that the study will not be performed, then the patient must receive options for alternative care.
Section 4: Elements and Components of CT Examination Performance

STANDARD – Elements of CT Examination Performance

4.1 Examination performance must include proper technique. All procedures must be explained to the patient and/or parents or guardian and informed consent obtained, if required.

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

4.1.1.1 Proper patient positioning.

4.1.1.2 Appropriate protocol selection based on:
   a. Clinical diagnosis;
   b. Patient age;
   c. Patient clinical presentation;
   d. Contraindications.

4.1.2 The dental practice 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:

4.1.2.1 The indication for the study.

4.1.2.2 Anatomical region(s) to be imaged.

4.1.2.3 Utilization of the correct technique for the indication.

4.1.2.4 Clear criteria for deviating from protocols.
   a. 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.
   b. If the physicist deems that the proposed change(s) is appropriate, the dental practice 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.

4.1.2.5 Adherence to established practice guidelines. There may be allowance for exceptions if validated.

4.1.2.6 All orientations/views that will be displayed.

4.1.2.7 Scanner settings to include, as appropriate:
   a. Field of view;
   b. Resolution;
   c. Time;
   d. KV;
   e. mA/mAs.

4.1.2.8 Instruction on data archiving and transmission of images including what files are to be stored/transmitted.
Section 5: Examination Interpretation

STANDARD – Examination Interpretation

5.1 CT examination reporting must be standardized in the dental practice. All dentists and physicians interpreting CT examinations in the dental practice must agree on a standardized report format for diagnostic and/or treatment planning CT examinations.

5.1.1 The final report must accurately reflect the content and results of the study. The report must include, but may not be limited to the:

5.1.1.1 patient name or ID;
5.1.1.2 age or date of birth;
5.1.1.3 date of the examination;
5.1.1.4 clinical indications leading to the performance of the examination;
5.1.1.5 an adequate description of the test performed including the:
   a. name of the examination;
   b. protocol used in the examination; and
   c. quality of the study.
5.1.1.6 an overview of the pertinent results of the examination;
5.1.1.7 whether the scan was adequate for treatment planning (if applicable);
5.1.1.8 appropriate recommendation for follow up of incidental findings;
5.1.1.9 the reasons for limited examinations (if applicable);
5.1.1.10 a summary of the pertinent test findings or treatment plan parameters;
5.1.1.11 comparison with previous studies (if applicable and available);
5.1.1.12 reports must be typewritten;
5.1.1.13 dentist/physician signature line (the printed name of the interpreting dentist or physician) and is manually or electronically signed by the interpreting dentist or physician; and
5.1.1.14 date of signature and/or verification (within four working days). Refer to section 3.2.3.1 on page 12.
Section 6: Procedure Volumes

STANDARD – Procedure Volumes

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

A dental practice should perform a minimum of 300 CT examinations annually. Each member of the dental 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 dental practice. Lower volumes than those recommended here, however, should not dissuade a dental practice that is otherwise compliant with the IAC CT Standards from applying for accreditation.
Section 7: Technical and Interpretive Quality Assessment (QA)

A quality assessment (QA) program must be in place and implemented to provide a standard of measurement of the technical and interpretive components of dental practice CT performance and the documentation of any variance.

STANDARD – Technical Quality Assessment

7.1 Under the supervision of the Dental Medical Director, and with the guidance of the Medical Physicist or qualified expert, the dental practice must have a defined quality assessment program that evaluates the ongoing technical quality and radiation dose information for the cone beam CT scans performed in the dental practice. Evaluations should be conducted on a periodic basis and include the review of examinations and reports. The selection may be random and determined by a percentage of the volume of cone beam CT scans performed or a fixed number.

7.2 The program should have predefined indicators of technical quality and predefined thresholds that indicate the need for corrective action. The dental practice should maintain reports of quality assessment evaluations and corrective actions taken.

7.2.1 Indicators should include, but are not limited to:

7.2.1.1 Adverse effects (i.e., repeat exams, patient incidents)

7.2.1.2 Image quality (i.e., field of view; artifacts; extent of coverage; adherence to protocol) required

7.2.1.3 Reproducibility of image quality and computer processing (i.e., reformats; electronic transfers)

7.2.2 Patient radiation dose review and assessment must be included in the program.

7.2.3 Documentation of the patient radiation exposure for each protocol in relevant dose units as determined by the medical physicist or qualified expert.

7.2.4 Review and monitoring of staff radiation exposure according to state regulations.

7.2.5 Thresholds are determined for each indicator. (i.e., for image quality, threshold for the percentage of scans that should be free from motion artifact = 90%)

7.2.6 Corrective actions (when identified) should be taken to improve the operation of the dental practice. (i.e., securing the patient’s head)

7.3 Appropriate Use Criteria (AUC)

7.3.1 As part of the ongoing quality improvement program, facilities providing computed tomography should incorporate the measurement of the appropriate use of this diagnostic imaging and treatment planning examination based on criteria published and/or endorsed by professional dental/medical organization(s), if available.

7.3.2 Overall results should be documented. The percentage of appropriate, inappropriate and uncertain indications for testing and/or treatment planning should be measured.

7.3.3 A program for education and reporting should be developed and may include but is not limited to:
7.3.3.1 Patterns of adherence to AUC
7.3.3.2 Baseline rates of adherence
7.3.3.3 Goals for improvement of adherence to appropriate use criteria
7.3.3.4 Measurement of improvement rate
7.3.3.5 Confidential comparison reports on patterns of adherence in aggregate by ordering dentist or physician, ordering practice, and interpreting practice.

STANDARD – Interpretive Quality Assessment

7.4 Under the supervision of the Dental Medical Director, the dental practice must have a defined quality assessment program that evaluates the ongoing quality of the interpretation of the CT examinations.

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

7.5.1 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 dentists or interpreting physicians. Dentists and 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 dentist, physician, technologist and patient confidentiality. (Strict attention must be paid to dentist, physician, staff and patient confidentiality as required by federal, state, local or institutional policy or regulation).

7.5.2 Correlation and confirmation of results

For those patients who have undergone CT examinations and surgical intervention or treatment, the results of CT examination and other procedures should be routinely compared. A process for reviewing variations between CT examination results and results of other procedures should be in place.

7.6 Quality Assessment review and documentation

The results of the technical and interpretive quality assessments must be reviewed and disseminated to the dental medical and technical staff at a minimum of two times per year.

7.7 Quality Assurance record keeping

Records must be maintained of the quality assessment process. These 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 7. The records must include a description of how the information is used to improve quality in the CT dental practice.
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