Computed Tomography

Candidates applying for certification and registration are required to meet the Professional Requirements specified in the *ARRT Rules and Regulations*. ARRT's *Computed Tomography Clinical Experience Requirements* describe the specific eligibility requirements that candidates must document as part of the application for certification and registration.

The purpose of the clinical experience requirements is to document that candidates have performed a subset of the clinical procedures within a discipline. Successful performance of these fundamental procedures, in combination with mastery of the cognitive knowledge and skills as documented by the examination requirement, provides the basis for the acquisition of the full range of clinical skills required in a variety of settings.

ARRT periodically updates the requirements based on a practice analysis, which is a systematic process to delineate the job responsibilities typically required of computed tomography (CT) technologists. The result of this process is a task inventory. A practice analysis committee then determines the number of clinical procedures required to demonstrate adequate candidate experience in performing the tasks on the inventory.

Candidates for CT certification and registration must document independent completion of CT clinical procedures according to the criteria noted below. Procedures are documented, verified, and submitted when complete via an online worksheet accessible through the candidate's ARRT account on www.arrt.org. ARRT encourages individuals to obtain education and experience beyond these minimum requirements.

A certified and registered technologist (postprimary certification not required) or an interpreting physician must verify completion of each procedure. The online worksheet describes the verification process.

A candidate can document up to 9 CT procedures per day in the online worksheet.

Remote scanning is not acceptable for completion of ARRT Clinical Requirements. The candidate must complete the examination or procedure at the facility where the patient and equipment are located. The candidate must be physically present during the examination or procedure.

For postprimary clinical experience requirement procedures, clinical verifiers are responsible for verifying the candidate's completion of procedures in accordance with ARRT requirements. Clinical verifiers are not required to directly observe the candidate performing the procedure and may perform their verification responsibilities remotely.

Specific Requirements for CT Procedures

The clinical experience requirements for CT consist of 67 procedures in 6 different categories:

A. Head, Spine, and Musculoskeletal
B. Neck and Chest
C. Abdomen and Pelvis
D. Additional Procedures
E. Image Display and Postprocessing
F. Quality Assurance

Candidates must document the performance of complete, diagnostic quality procedures according to the following requirements:

- Choose a minimum of 25 different procedures out of the 67 procedures on the following pages.
- Complete and document a minimum of 3 and a maximum of 5 repetitions of each chosen procedure; fewer than 3 will not count toward the total.
- A minimum of 125 repetitions is required.
- A minimum of 30 repetitions must be done with iodinated IV contrast media.
- No more than 1 procedure may be documented per patient per day. For example, if an order requests CT chest, abdomen, and pelvis scans for a patient, only 1 of these may be used for clinical experience documentation.
- CT procedures performed for the purpose of a PET/SPECT attenuation correction or radiation therapy planning are not eligible for CT clinical experience documentation.
- Any non-cone-beam CT scanner may be used to fulfill ARRT's clinical experience requirements (e.g., *hybrid scanner, therapy planning scanner).

Examples

Candidate A: This technologist works in a specialized setting and completes 25 different procedures (the minimum). To complete 125 repetitions, each of the 25 different procedures was performed 5 times.

Candidate B: This technologist works in a facility that does most types of CT scans, so completing a wide variety of procedures is feasible. A total of 35 different procedures were completed and documented. Although most of these procedures were performed 3 times (the minimum), some were performed 4 or 5 times (the maximum) until the candidate reached at least 125 repetitions.

General Guidelines

To qualify as a complete, diagnostic quality CT procedure, the candidate must independently demonstrate appropriate:

- evaluation of the requisition and/or medical record
- preparation of the examination room
- patient identification
- patient assessment and education concerning the procedure
- documentation of the patient's history, including allergies
- preparation and/or administration of contrast media, when indicated
- patient positioning
- protocol selection
- parameter selection
- scan initiation
- image display and archiving
- documentation of the procedure and patient data in appropriate record
- patient discharge with postprocedure instructions
- CDC Standard Precautions
- radiation safety

*"e.g." indicates examples of the topics covered, but is not a complete list

and evaluate the resulting images for:

- technical image quality (e.g., motion, artifacts, noise)
- optimal demonstration of anatomic region (e.g., delayed imaging, reconstruction algorithm, slice thickness)
- recognition of relevant pathology
- procedure completeness

Attention: Your certification and registration process has requirements to complete clinical procedures including activating actual CT scans, known as “initiating the scan” or “making the exposure.” You are responsible for ensuring state laws allow you to complete this requirement.

Procedures

A. Head, Spine, and Musculoskeletal
   1. head without contrast
   2. head with contrast**
   3. head trauma
   4. head arteriography (CTA)**
   5. head venography (CTV)**
   6. brain perfusion**
   7. temporal bones / IACs
   8. orbits
   9. sinuses
   10. maxillofacial bones
   11. dedicated mandible
   12. cervical spine
   13. thoracic spine
   14. lumbosacral spine
   15. postmyelogram
   16. spine trauma
   17. upper extremity
   18. lower extremity
   19. postarthrogram
   20. shoulder
   21. bony pelvis
   22. hip
   23. extremity trauma
   24. extremity arteriography/runoff (CTA)**
   25. extremity venography (CTV)**

B. Neck and Chest
   1. larynx/airway without contrast
   2. soft tissue neck**
   3. neck arteriography (CTA)**
   4. neck venography (CTV)**
   5. chest without contrast
   6. chest with contrast**
   7. chest trauma**
   8. vascular chest (CTA, CTV, aorta, SVC)**
   9. pulmonary angiography / PE study (CTPA)**
   10. cardiac** (e.g., coronary angiography, gating, TAVR)
   11. coronary artery calcium scoring
   12. lungs (e.g., HRCT, ILD, nodule)
   13. low-dose lung screening
   14. esophagram with oral contrast

C. Abdomen and Pelvis
   1. abdomen/pelvis without contrast
   2. abdomen/pelvis with contrast**
   3. abdomen trauma**
   4. multiphase liver**
   5. multiphase pancreas**
   6. multiphase adrenals**
   7. multiphase kidneys**
   8. urogram/IVU**
   9. renal stone
   10. enterography
   11. appendicitis**
   12. abdomen/pelvis arteriography (CTA)**
   13. abdomen/pelvis venography (CTV)**
   14. pelvis trauma**
   15. retrograde cystogram
   16. colorectal (rectal contrast)
   17. colonography (“virtual”)

D. Additional Procedures
   1. biopsy
   2. drainage
   3. aspiration
   4. infant / young child (6 and under)
   5. surgical planning

E. Image Display and Postprocessing
   1. distance measurement or region of interest (ROI)
   2. multiplanar reconstruction (MPR)
   3. 3D rendering (e.g., MIP, SSD, volume rendering)
   4. retrospective reconstruction with different parameters (e.g., DFOV, algorithm, slice thickness)

F. Quality Assurance
   1. X-ray tube warmup and calibration checks
   2. CT number and standard deviation (water phantom)

** The use of iodinated IV contrast is mandatory to document this procedure.