



Radiography

Certification and registration requirements for radiography are based, in part, on the results of a comprehensive practice analysis conducted by The American Registry of Radiologic Technologists® (ARRT®) staff and the Practice Analysis & Continuing Qualification Requirements (CQR) Advisory Committee. The purpose of the practice analysis is to identify job responsibilities typically required of staff radiographers at entry into the profession. In 2015 the ARRT surveyed a large, national sample of radiographers who perform radiography. The results of the practice analysis are reflected in this document. The purpose of the task inventory is to list or delineate those responsibilities. The task inventory is the foundation for both the clinical requirements and the content specifications.

Basis of Task Inventory

The practice analysis survey was used to identify the responsibilities typically required of staff radiographers. When evaluating survey results, the advisory committee applied a 40% guideline. That is, to be included on the task inventory an activity must have been the responsibility of at least 40% of staff radiographers. The advisory committee could include an activity that did not meet the 40% criterion if there was a compelling rationale to do so (e.g., a task that falls below the 40% guideline but is expected to rise above the 40% guideline in the near future, a task below 40% that is especially critical in some settings).

Application to Clinical Competency Requirements

The purpose of the clinical requirements is to verify that candidates have completed fundamental clinical procedures in radiography. Successful performance of these fundamental procedures, in combination with mastery of the cognitive knowledge and skills covered by the radiography examination, provides the basis for acquisition of the full range of clinical skills required in a variety of settings. An activity must appear on the task inventory to be considered for inclusion in the clinical competency requirements. For an activity to be designated as a mandatory requirement, survey results had to indicate that the vast majority of radiographers performed that activity. The advisory committee designated clinical activities performed by fewer radiographers, or which are carried out only in selected settings, as elective. Alternatively, the advisory committee sometimes stipulated that such procedures could be simulated rather than performed on actual patients. The clinical competency requirements are available at arrt.org and appear in the *Radiography Certification and Registration Handbook*.

Application to Content Specifications

The primary purpose of the ARRT Examination in Radiography is to assess the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required of staff radiographers. The content specifications identify the knowledge areas underlying performance of the tasks on the task inventory. Every content category can be linked to one or more activities on the task inventory. Note that each activity on the task inventory is followed by a content category that identifies the section of the content specifications corresponding to that activity. The content specifications are available at arrt.org and appear in the *Radiography Certification and Registration Handbook*.



Activity	Content Categories
	Legend: PC = Patient Care, S = Safety, IP = Image Production, P = Procedures
1. Confirm patient's identity.	PC.1.A.2.A., PC.1.B.
2. Evaluate patient's ability to understand and comply with requirements for the requested examination.	PC.1.B.
3. Obtain pertinent medical history.	PC.1.A.2.A., PC.1.B., PC.1.G.1.A.
4. Manage complex interpersonal interactions within the workplace in an effective manner.	PC.1.B.2.
5. Explain and confirm patient's preparation (e.g., diet restrictions, preparatory medications) prior to beginning imaging examinations.	PC.1.B.3.C.
6. Review imaging examination request to verify accuracy and completeness of information (e.g., patient history, clinical diagnosis, physician's orders).	PC.1.A.2.A.
7. Respond as appropriate to imaging study inquiries from patients.	PC.1.B.
8. Sequence imaging procedures to avoid residual contrast material affecting future exams.	PC.1.G.1.D.
9. Assume responsibility for medical equipment attached to patients (e.g., IVs, oxygen) during the imaging procedures.	PC.1.C.2.
10. Follow environmental protection standards for handling and disposing of bio-hazardous materials (e.g., sharps, blood and body fluids).	PC.1.E.3.E.
11. Provide for patient safety, comfort, and modesty.	PC.1.A., PC.1.C.
12. Notify appropriate personnel of adverse events or incidents (e.g., patient fall, wrong patient imaged).	PC.1.A.2.A., PC.1.C.3., PC.1.G.6.D., IP.1.E.
13. Communicate scheduling delays to waiting patients.	PC.1.B.
14. Demonstrate and promote professional and ethical behavior.	PC.1.A., PC.1.B.
15. Verify informed consent as necessary.	PC.1.A.1.A., PC.1.B.3.B.
16. Recognize abnormal lab values relative to the imaging study ordered.	PC.1.G.5.C.
17. Communicate relevant information to others (e.g., MDs, RNs, other radiology personnel).	PC.1.A., A.1.B., PC.1.C.3.D., PC.1.G.
18. Explain procedure instructions to patient or patient's family.	PC.1.B.3.A
19. Practice Standard Precautions.	PC.1.E.3.
20. Follow appropriate procedures when caring for patients with communicable diseases.	PC.1.E.3., PC.1.E.4., PC.1.E.5.
21. Use immobilization devices, as needed, to prevent patient movement and/or ensure patient safety.	PC.1.A.2.D., P.
22. Use proper body mechanics when assisting a patient.	PC.1.C.1.A



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23. Use patient transfer devices when needed.	PC.1.C.1.B	
24. Prior to administration of a medication other than a contrast agent, review information to prepare appropriate type and dosage.	PC.1.G.1.	
25. Prior to administration of a contrast agent, review information to prepare appropriate type and dosage.	PC.1.G.4., PC.1.G.5.	
26. Prior to administration of a contrast agent, determine if patient is at risk for an adverse reaction.	PC.1.G.1., PC.1.G.5.	
27. Use sterile or aseptic technique when indicated.	PC.1.E.2., PC.1.G.3.	
28. Perform venipuncture.	PC.1.E.3.C., PC.1.G.3	
29. Administer IV contrast agents.	PC.1.G.2., PC.1.G.4.	
30. Observe patient after administration of a contrast agent to detect adverse reactions.	PC.1.G.6.	
31. Follow environmental protection standards for handling hazardous materials (e.g., chemotherapy IV, radioactive implant).	PC.1.F., S.2.B.6.	
32. Obtain vital signs.	PC.1.C.3.A.	
33. Recognize and communicate the need for prompt medical attention.	PC.1.C.3., PC.1.D., PC.1.G.6.	
34. Administer emergency care.	PC.1.C.2., PC.1.C.3., PC.1.D., PC.1.G.6.	
35. Explain post-procedural instructions to patient or patient's family.	PC.1.B.3.C.	
36. Maintain confidentiality of patient information.	PC.1.A.1.B., PC.1.A.3.	
37. Clean, disinfect, or sterilize facilities and equipment, and dispose of contaminated items in preparation for next examination.	PC.1.E.2, PC.1.E.3.	
38. Document required information on patient's medical record (e.g., imaging procedure documentation, images). a. On paper b. Electronically	PC.1.B.1.A., PC.1.C.3.D., PC.1.G.6.D., IP.1.E., IP.2.B.6.	
39. Evaluate the need for and use of protective shielding.	S.2.A.2., S.2.B.	
40. Take appropriate precautions to minimize radiation exposure to the patient.	S.2.A.	
41. Question female patient of child-bearing age about date of last menstrual period or possible pregnancy and take appropriate action (e.g., document response, contact physician).	PC.1.B., S.1.B.5., S.1.B.6.	
42. Restrict beam to the anatomical area of interest.	S.2.A.3., S.1.A.1.H., S.1.A.2.H.	



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43. Set technical factors to produce diagnostic images and adhere to ALARA.	S.2.A., IP.1.A, IP.1.B., IP.1.C.
44. Document radiographic procedure dose.	S.2.A.6., IP.2.B.6.E
45. Select continuous or pulsed fluoroscopy.	S.2.A.9.A.
46. Document fluoroscopy time.	S.2.A.9.L., IP.2.A.3
47. Document fluoroscopy dose.	S.2.A.9.L., IP.2.A.3
48. Prevent all unnecessary persons from remaining in area during x-ray exposure.	S.2.B.5.B.
49. Take appropriate precautions to minimize occupational radiation exposure.	S.2.B.
50. Advocate radiation safety and protection.	S.1.B., S.2.A., S.2.B.5.B.
51. Describe the potential risk of radiation exposure when asked.	PC.1.B.3., S.1.B.
52. Wear a personnel monitoring device while on duty.	S.2.B.5.A.
53. Evaluate individual occupational exposure reports to determine if values for the reporting period are within established limits.	S.2.B.5.B.
54. Determine appropriate exposure factors using the following: a. Fixed kVp technique chart b. Variable kVp technique chart c. Calipers (to determine patient thickness for exposure) d. Anatomically programmed technique	IP.1.A., IP.1.B.
55. Select radiographic exposure factors: a. Automatic Exposure Control (AEC) b. kVp and mAs (manual)	IP.1.A., IP.1.B., IP.1.C.
56. Operate radiographic unit and accessories including: a. Fixed unit b. Mobile unit (portable)	IP.2.A.1., IP.2.A.2., IP.2.A.4., IP.2.A.5.
57. Operate fluoroscopic unit and accessories including: a. Fixed fluoroscopic unit b. Mobile fluoroscopic unit (C-arm)	IP.2.A.3.
58. Operate electronic imaging and record keeping devices including: a. Computed radiography (CR) with photostimulable storage phosphor (PSP) plates b. Direct radiography (DR) c. Picture archiving and communication system (PACS) d. Hospital information system (HIS) e. Radiology information system (RIS) f. Electronic medical record (EMR) system	IP.2.A.4., IP.2.B.
59. Modify technical factors to correct for noise in a digital image.	IP.1.D.3.B., IP.2.C.



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60.	Remove all radiopaque materials from patient or table that could interfere with the image (e.g., clothing removal, jewelry removal).	PC.1.B.3.A., IP.2.C.8.
61.	Perform post-processing on digital images in preparation for interpretation.	IP.2.B.4.
62.	Use radiopaque anatomical side markers at the time of image acquisition.	IP.1.F., IP.2.C.7.
63.	Add electronic annotations on digital images to indicate position or other relevant information (e.g., time, upright, decubitus, post-void).	PC.1.A.2.E., IP.1.E., IP.2.C.7.
64.	Select equipment and accessories (e.g., grid, compensating filter, shielding) for the examination requested.	S.2.A.2., IP.1.A.1.F., IP.1.A.2.F., IP.2.A.5.
65.	Explain breathing instructions prior to making the exposure.	PC.1.B.3.A., IP.1.A.3.I., P.
66.	Position patient to demonstrate the desired anatomy using anatomical landmarks.	P.
67.	Modify exposure factors for circumstances such as involuntary motion, casts and splints, pathological conditions, contrast agent, or patient's inability to cooperate.	IP.1.A.3.I., IP.1.A.3.K., IP.1.B., IP.1.C.
68.	Verify accuracy of patient identification on image.	IP.1.E., IP.2.C.6.
69.	Evaluate images for diagnostic quality.	IP.2.C., IP.2.D., P.
70.	Respond appropriately to digital exposure indicator values.	IP.2.C.2.
71.	Determine corrective measures if image is not of diagnostic quality and take appropriate action.	IP.2.C., P.
72.	Identify image artifacts and make appropriate corrections as needed.	IP.2.C.8.
73.	Store and handle image receptor in a manner which will reduce the possibility of artifact production.	IP.2.C.8., IP.2.C.9., IP.2.D.3.
74.	Visually inspect, recognize, and report malfunctions in the imaging unit and accessories.	IP.2.C.8., IP.2.D.2.
75.	Recognize the need for periodic maintenance and evaluation of radiographic equipment affecting image quality and radiation safety (e.g., shielding, image display monitor, light field, central ray detector calibration).	IP.2.D.
76.	Perform routine maintenance on digital equipment including: a. Detector calibration b. CR plate erasure c. Equipment cleanliness d. Test images	IP.2.D.3.



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77.	Adapt radiographic and fluoroscopic procedures for patient condition (e.g., age, size, trauma, pathology) and location (e.g., mobile, surgical, isolation).	PC.1.C., PC.1.E., S.2.A.5., S.2.A.9., IC.1., P.
78.	Select appropriate geometric factors (e.g., SID, OID, focal spot size, tube angle). Position patient, x-ray tube, and image receptor to perform the following diagnostic examinations:	IP.1.A.
79.	Chest	P.2.A.1.
80.	Ribs	P.2.A.2.
81.	Sternum	P.2.A.3.
82.	Abdomen	P.2.B.1.
83.	Esophagus	P.2.B.2.
84.	Swallowing dysfunction study	P.2.B.3.
85.	Upper GI series, single or double contrast	P.2.B.4.
86.	Small bowel series	P.2.B.5.
87.	Contrast enema (e.g., barium, iodinated), single or double contrast	P.2.B.6.
88.	Surgical cholangiography	P.2.B.7.
89.	ERCP	P.2.B.8.
90.	Cystography	P.2.C.1.
91.	Cystourethrography	P.2.C.2.
92.	Intravenous urography	P.2.C.3.
93.	Retrograde urography	P.2.C.4.
94.	Hysterosalpingography	P.1.B.9.
95.	Cervical spine/soft tissue neck	P.1.B.1., P.2.A.4.
96.	Thoracic spine	P.1.B.2.
97.	Scoliosis series	P.1.B.3.
98.	Lumbar spine	P.1.B.4.
99.	Sacrum/coccyx	P.1.B.5.
100.	Sacroiliac joints	P.1.B.7.
101.	Pelvis/hip	P.1.B.8.
102.	Skull	P.1.A.1.
103.	Facial bones	P.1.A.2.
104.	Mandible	P.1.A.3.



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105.	Zygomatic arch	P.1.A.4.
106.	Temporomandibular joints	P.1.A.5.
107.	Nasal bones	P.1.A.6.
108.	Orbits	P.1.A.7.
109.	Paranasal sinuses	P.1.A.8.
110.	Toes	P.3.B.1.
111.	Foot	P.3.B.2.
112.	Calcaneus	P.3.B.3.
113.	Ankle	P.3.B.4.
114.	Tibia/fibula	P.3.B.5.
115.	Knee/patella	P.3.B.6.
116.	Femur	P.3.B.7.
117.	Fingers	P.3.A.1.
118.	Hand	P.3.A.2.
119.	Wrist	P.3.A.3.
120.	Forearm	P.3.A.4.
121.	Elbow	P.3.A.5.
122.	Humerus	P.3.A.6.
123.	Shoulder	P.3.A.7.
124.	Scapula	P.3.A.8.
125.	Clavicle	P.3.A.9.
126.	Acromioclavicular joints	P.3.A.10.
127.	Bone survey	P.1.C.2.
128.	Long bone measurement	P.3.B.8.
129.	Bone age	P.3.C.1.
	Assist radiologist with the following invasive procedures:	
130.	Joint injection (arthrography)-fluoroscopic guided contrast injection	P.3.C.3.
131.	Myelography-fluoroscopic guided contrast injection	P.1.B.6.