Radiography

Certification and registration requirements for radiography are based on the results of a comprehensive practice analysis conducted by The American Registry of Radiologic Technologists (ARRT) staff and the Radiography Practice Analysis Committee. The purpose of the practice analysis is to identify job responsibilities typically required of radiographers at entry into the profession. The results of the practice analysis are reflected in this document. The attached task inventory is the foundation for ARRT's clinical competency requirements and content outline which in turn is the foundation for the examination content specifications and CQR SSA content specifications.

Basis of Task Inventory

In 2019, the ARRT surveyed a large, national sample of radiographers to identify their responsibilities. When evaluating survey results, the committee applied a 40% criterion. That is, to be included on the task inventory, an activity must have been performed by at least 40% of radiographers. The 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% criterion but is expected to rise above the 40% criterion in the near future).

Application to Clinical Competency Requirements

The purpose of the clinical requirements is to verify that individuals certified by the ARRT have demonstrated competence performing the clinical activities fundamental to a particular discipline. Competent performance of these fundamental activities, in conjunction with mastery of the cognitive knowledge and skills covered by the certification examination, provides the basis for the acquisition of the full range of procedures typically required in a variety of settings. Demonstration of clinical competence means that the candidate has performed the procedure independently, consistently, and effectively during the course of his or her formal education. 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 radiographers performed that activity. The committee designated clinical activities performed by fewer radiographers or which are carried out only in selected settings, as elective. The *Radiography Didactic and Clinical Competency Requirements* are available from ARRT's website (www.arrt.org).

Application to Content Specifications

The purpose of the exam is to assess the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required of the staff technologist at entry into the profession. 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 *Radiography Content Specifications* are available from ARRT's website (www.arrt.org).

* The abbreviation "e.g.," is used to indicate that examples are listed in parentheses, but that it is not a complete list of all possibilities.

Activity			**Content Categories** Legend: PC = Patient Care, S = Safety, IP = Image Production, P = Procedures
	1.	Sequence imaging procedures to avoid affecting subsequent examinations (e.g., residual contrast material).	PC.1.B.3.C, PC.1.G.1.D, PC.1.G.4
	2.	Verify the patient's identity.	PC.1.A.2.A
	3.	Evaluate the patient's ability to understand and comply with requirements for the requested examination.	PC.1.B, S.2.A.4.B
	4.	Obtain pertinent medical history.	PC.1.A.2.A, PC.1.C.3.B, PC.1.G.1
	5.	Manage interpersonal interactions in an effective manner.	PC.1.B.2
	6.	Explain and confirm the patient's preparation (e.g., diet restrictions, preparatory medications).	PC.1.B.3.B
	7.	Review the examination request to verify information is accurate, appropriate, and complete (e.g., patient history, clinical diagnosis, physician's orders).	PC.1.A.2.A
	8.	Explain the procedure instructions to patient, patient's family, or authorized representative (e.g., pre-procedure, post procedure).	PC.1.B.3.A
	9.	Respond as appropriate to procedure inquiries from the patient, patient's family, or authorized representative (e.g., scheduling delays, exam duration).	PC.1.B.3.A
	10.	Monitor the patient's auxiliary medical equipment (e.g., IVs, oxygen) during a procedure.	PC.1.C.2
	11.	Follow environmental protection standards for handling and disposing of bio-hazardous materials (e.g., sharps, blood, body fluids).	PC.1.E.3.D, PC.1.F.2
	12.	Follow environmental protection standards for handling and disposing of hazardous materials (e.g., disinfectant, chemotherapy IV, radioactive implant).	PC.1.F
	13.	Provide for the patient's safety, comfort, and modesty.	PC.1.A, PC.1.C
	14.	Notify appropriate personnel of adverse events or incidents (e.g. patient fall, wrong patient imaged).	PC.1.A.2.F, PC.1.C.3, PC.1.G.6.D, IP.1.E
	15.	Demonstrate and promote professional and ethical behavior (e.g., confidentiality, regulation compliance).	PC.1.A, PC.1.B
	16.	Verify informed consent as necessary.	PC.1.A.1.A
	17.	Recognize abnormal or missing lab values relative to the procedure ordered.	PC.1.G.5.C
	18.	Handle, label, and submit laboratory specimens (e.g., cerebrospinal fluid, synovial fluid).	P.1.B.6, P.3.C.3

Activity			**Content Categories** Legend: PC = Patient Care, S = Safety, IP = Image Production, P = Procedures
	19.	Communicate relevant information to appropriate members of the care team.	PC.1.A, PC.1.B, PC.1.G
	20.	Practice Standard Precautions.	PC.1.E.3
	21.	Follow appropriate procedures when caring for patients with communicable diseases.	PC.1.E.3, PC.1.E.4, PC.1.E.5
	22.	Use positioning aids, as needed, to reduce patient movement, and/or promote patient safety.	PC.1.A.2.D, P.
	23.	Use proper body mechanics and/or ergonomic devices to promote personnel safety.	PC.1.C.1
	24.	Prior to administration of a medication other than a contrast agent, review pertinent information to prepare appropriate type and dosage.	PC.1.G.1, PC.1.G.2
	25.	Prior to administration of a contrast agent, review pertinent information to prepare appropriate type and dosage.	PC.1.G.1, 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.2.C
	28.	Perform venipuncture.	PC.1.G.2.C
	29.	Administer contrast agents as required by the procedure.	PC.1.G..2, PC.1.G.4, PC.1.G.5
	30.	Assess the patient after administration of a contrast agent to detect adverse reactions.	PC.1.C.3, PC.1.G.6
	31.	Obtain vital signs.	PC.1.C.3.A
	32.	Recognize and communicate the need for prompt medical attention.	PC.1.C.3, PC.1.D, PC.1.G.6
	33.	Assist with providing emergency care (e.g., CPR).	PC.1.C.3, PC.1.D, PC.1.G.6
	34.	Clean and disinfect or sterilize facilities and equipment.	PC.1.E.2.A, PC.1.E.2.B
	35.	Document required information on the patient's medical record (e.g., imaging procedure documentation, images, adverse events).	PC.1.A.2.F, PC.1.B.1.A, PC.1.C.3, PC.1.G.6.D, IP.1.E, IP.2.B.6
	36.	Evaluate the need for and use of protective shielding.	S.2.B
	37.	Take appropriate precautions to minimize radiation exposure to the patient.	S.2.A
	38.	Screen female patients of childbearing age for the possibility of pregnancy and take appropriate action (e.g., document response, contact physician).	PC.1.B, S.2.A.4

Activity			**Content Categories** Legend: PC = Patient Care, S = Safety, IP = Image Production, P = Procedures
	39.	Restrict beam to the anatomical area of interest.	S.2.A.3, IP.1.A.1.H, IP.2.A.2.F
	40.	Set technical factors to produce optimal images and minimize patient dose.	S.2.A.1, IP.1.A, IP.1.B, IP.1.C
	41.	Document radiographic procedure dose.	S.2.A.6, S.2.A.9.K
	42.	Take appropriate action to minimize fluoroscopy dose.	S.2.A.9
	43.	Document fluoroscopy time.	S.2.A.9.K, IP.2.A.4
	44.	Document fluoroscopy dose.	S.2.A.9.K, IP.2.A.4
	45.	Keep all unnecessary persons out of the immediate area during radiation exposure.	S.2.B.5.B
	46.	Take appropriate precautions to minimize occupational radiation exposure.	S.2.B
	47.	Advocate radiation safety and protection.	S.2.A, S.2.B
	48.	Describe the potential risk of radiation exposure when asked.	PC.1.B.3, S.1.B
	49.	Wear a radiation monitoring device while on duty.	S.2.B.5
	50.	Evaluate individual occupational exposure reports to determine if values for the reporting period are within established limits.	S.2.B.5.B
	51.	Select appropriate radiographic exposure factors using the following: a. Fixed kVp technique chart b. Variable kVp technique chart c. Automatic Exposure Control (AEC) d. Anatomically programmed technique	IP.1.A, IP.1.B, IP.1.C
	52.	Operate radiographic unit and accessories including: a. Fixed unit b. Mobile unit	IP.2.A.1, IP.2.A.2, IP.2.A.3, IP.2.A.4
	53.	Operate fluoroscopic unit and accessories including: a. Fixed fluoroscopic unit b. Mobile fluoroscopic unit (e.g., C-arm, O-arm)	IP.2.A.4
	54.	Operate digital imaging devices and information technology systems including: a. Computed radiography (CR) b. Digital radiography (DR) c. Picture archiving and communication systems (PACS) d. Medical information systems (e.g., HIS, RIS, EMR, EHR)	IP.2.A.2.E, IP.2.A.3, IP.2.B
	55.	Recognize and report malfunctions in the information technology systems (e.g., downtime procedures).	IP.2.B.6.C

Activity			**Content Categories** Legend: PC = Patient Care, S = Safety, IP = Image Production, P = Procedures
	56.	Remove radiopaque materials that could interfere with the image from the exposure field (e.g., clothing, jewelry).	PC.1.B.3.A, IP.1.F.8
	57.	Use radiopaque anatomical side markers at the time of image acquisition.	IP.1.F.7
	58.	Select imaging accessories (e.g., grid, compensating filter) for the examination requested.	IP.1.A, IP.1.B.4.F, IP.2.A.3
	59.	Align central ray to body part and image receptor to demonstrate the desired anatomy.	P.
	60.	Explain breathing instructions prior to making the exposure.	PC.1.B.3.A, IP.1.A.3.I, P.
	61.	Position patient to demonstrate the desired anatomy using anatomical landmarks.	P.
	62.	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.4, IP.1.C
	63.	Adapt procedures for: a. Patient condition (e.g., age, size, trauma, pathology) b. Location (e.g., mobile, surgical, isolation)	PC.1.C, PC.1.E, S.2.A.4, S.2.A.9, IP.1.A, IP.1.B, IP.1.C, P.
	64.	Select appropriate geometric factors (e.g., SID, OID, focal spot size, tube angle).	IP.1.A
	65.	Evaluate images for diagnostic quality.	IP.1.F, IP.12.C, P.
	66.	Respond appropriately to exposure indicator values.	IP.1.F.1
	67.	Verify accuracy of patient identification associated with images.	IP.1.E, IP.1.F.7
	68.	Add electronic annotations on images to indicate position or other relevant information (e.g., time, upright, decubitus, post-void).	PC.1.A.2.E, IP.1.E, IP.1.F.7
	69.	Perform post-processing on images in preparation for interpretation.	IP.2.B.4
	70.	Determine corrective measures if image is not of diagnostic quality and take appropriate action.	IP.1.F, P.
	71.	Identify image artifacts and make appropriate corrections as needed.	IP.1.F.8, P.
	72.	Store and handle image receptor in a manner which will reduce the possibility of artifact production.	IP.1.F.8, IP.1.F.9, IP.2.C.3
	73.	Recognize and report malfunctions in the imaging unit and accessories.	IP.1.F.8, IP.2.C.2

Activity			Content Categories Legend: PC = Patient Care, S = Safety, IP = Image Production, P = Procedures
	74.	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.C
	75.	Perform routine maintenance on digital equipment including: a. Detector calibration b. CR plate erasure c. Equipment cleanliness d. Test images	IP.2.C.3
		Perform the following diagnostic examinations:	
	76.	Chest	P.2.A.1
	77.	Ribs	P.2.A.2
	78.	Soft tissue neck	P.2.A.4
	79.	Sternum	P.2.A.3
	80.	Sternoclavicular joints	P.2.A.5
	81.	Abdomen	P.2.B.1
	82.	Esophagus	P.2.B.2
	83.	Swallowing dysfunction study	P.2.B.3
	84.	Foreign body, airway or ingested	P.2.A.1, P.2.A.4, P.2.B.1
	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.2.C.5
	95.	Cervical spine	P.1.B.1
	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

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