Mammography

Certification and registration requirements for mammography are based on the results of a comprehensive practice analysis conducted by The American Registry of Radiologic Technologists (ARRT) staff and the Mammography Practice Analysis and Continuing Qualification Requirements (CQR) Advisory Committee. The purpose of the practice analysis is to identify job responsibilities typically required of mammographers at entry into the profession. 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 attached task inventory is the foundation for both the clinical experience requirements and the content specifications.

Basis of Task Inventory

In 2018, the ARRT surveyed a large, national sample of mammographers to identify their responsibilities. When evaluating survey results, the advisory committee applied a 40% criterion. That is, to be included on the task inventory, an activity must have been the responsibility of at least 40% of mammographers. 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% criterion but is expected to rise above the 40% criterion in the near future).

Application to Clinical Experience Requirements

The purpose of the clinical experience requirements is to verify that candidates have completed fundamental clinical procedures in mammography. Successful performance of these fundamental procedures, in combination with mastery of the knowledge and cognitive skills covered by the mammography 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 experience requirements. For an activity to be designated as a mandatory requirement, survey results had to indicate that the vast majority of mammographers performed that activity. The advisory committee designated clinical activities performed by fewer mammographers or which are carried out only in selected settings, as elective. The clinical experience requirements are available from ARRT's website (www.arrt.org).

Application to Content Specifications

The purpose of the ARRT Mammography Examination is to assess the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required of mammographers 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 content specifications are available from ARRT's website (www.arrt.org).

Activity		Content Categories Legend: PC = Patient Care, IP = Image Production, P = Procedures
1.	Provide premammographic instructions such as changing clothes or removal of deodorant, jewelry, etc.	PC.1.A.1.
2.	Explain mammography procedure to patient (*e.g., positioning, compression).	PC.1.A.2.
3.	Evaluate patient's ability to understand and comply with the requirements for the requested examination.	PC.1.A.2.B., PC.1.A.2.C.
4.	Explain the importance of having prior images, if available.	PC.1.B.4.A.
5.	Review previous mammograms prior to exam, if available.	PC.1.B.4.B.
6.	Verify previous mammograms are available for interpreting physician.	PC.1.B.4.A., PC.1.B.4.B.
7.	Obtain pertinent clinical and family history.	PC.1.A.2.
8.	Ask patient about prior breast surgery, including surgery related to breast augmentation or reduction.	PC.1.B.1., PC.1.B.2.
9.	Document required information on patient's medical record (e.g., family and surgical history, pathology).	PC.1.B.3.
	Respond as appropriate to questions from patient or patient's family about:	
10.	benefits and risks of mammography screening, including typical patient dose	PC.1.A.D.
11.	guidelines for mammography screening (ACS, ACR)	PC.1.A.3.A.
12.	breast self-examination	PC.1.A.3.B.
13.	clinical breast examination	PC.1.A.3.B.
14.	incidence and risk factors for breast cancer	PC.1.A.3.C.
15.	gene mutations (e.g., BRCA1 and BRCA2)	PC.1.B.1.B.6.
16.	hormone receptor status (e.g., ER+/-, PR+/-, HER2/neu)	PC.1.C.2.C., PC.1.B.1.B.3
17.	hormone replacement therapy	PC.1.B.1.B.15.
18.	breast density	PC.1.B.1.B.16
19.	surgical treatment options for breast cancer (e.g., breast-conserving surgery, mastectomy)	PC.1.C.1.
20.	sentinel lymph node biopsy and axillary lymph node dissection	PC.1.C.1.B., P.2.C.4.
21.	nonsurgical treatment options for breast cancer a. radiation therapy b. chemotherapy c. hormonal therapy	PC.1.C.2.
22.	breast reconstructive surgery a. breast implants b. TRAM flap c. latissimus dorsi flap	PC.1.C.3.

* 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, IP = Image Production, P = Procedures
	Respond as appropriate to questions from patient or patient's family about: (continued)	
23.	external and internal anatomy, histology, and pathology of the breast	P.1.
24.	benign, high risk, and malignant conditions of the breast	P.1.E.
25.	BI-RADS® categories	P.1.E.1.D.
26.	other breast imaging examinations a. breast ultrasound b. sentinel node mapping c. breast MRI	P.1.E.1.D.
27.	accreditation of mammography facilities and personnel	IP.1.C.
28.	timeliness of receiving results	IP.1.C.2.B.
29.	Follow MQSA process for documenting and resolving patient complaints.	IP.1.C.2.D.
30.	Refer questions about diagnosis or prognosis to referring physician.	IP.1.C.2.B.
31.	Review imaging request to verify information is accurate, appropriate, and complete (e.g., patient history, clinical diagnosis, physician's orders).	PC.1.B.3., IP.1.C.2.D.
32.	Perform visual breast exam based on patient communication documenting location of lumps, scars, moles, breast changes, etc., per protocol.	PC.1.B.3., PC.1.B.2.
33.	Select equipment appropriate to the patient and the examination to be performed (e.g., magnification stand, compression paddle).	IP.1.A.3., P.2.B.
34.	Position patients with special situations (e.g., males, kyphotic patients) to obtain appropriate mammographic images.	P.2.B.
35.	Instruct patient in proper breathing prior to exposure.	PC.1.A.2.
36.	Acquire the digital 2D or 3D (digital breast tomosynthesis) image.	IP.1.B.1.
37.	Interact with digital image display and informatics (e.g., HIS/RIS, PACS).	IP.1.B.4.
38.	Verify CAD has been applied per protocol.	IP.1.B.5.
39.	Comply with MQSA regulations.	IP.1.C.2.
40.	Identify and document mammographic unit malfunctions.	IP.1.A., IP.1.B., IP.1.D.
	Perform and evaluate the results of the following QC tests:	
41.	phantom image quality	IP.1.D.1.A.
42.	visual checklist	IP.1.D.1.C.
43.	repeat analysis	IP.1.D.1.E.
44.	monitor cleanliness	IP.1.D.1.D.1.
45.	viewing conditions (e.g., room lighting)	IP.1.D.1.F.
46.	compression force	IP.1.D.1.G.
47.	compression thickness indicator	IP.1.D.1.B.

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	Perform and evaluate the results of the following QC tests: (continued)	
48.	manufacturer detector calibration (e.g., artifact evaluation)	IP.1.D.1.H.
49.	system resolution test a. spatial resolution (e.g., line pair pattern) b. modulation transfer function (MTF) c. signal-to-noise ratio (SNR) d. contrast-to-noise ratio (CNR)	IP.1.D.2.C.
50.	radiologist workstation monitor QC a. SMPTE b. TG18	IP.1.D.1.D.2.
51.	Recognize frequency and purpose of QC tests performed by the physicist.	IP.1.D.2.
52.	Review physicist's mammography annual survey report.	IP.1.C.2.B., IP.1.D.2.
53.	Confirm exposure factors, target/filter combination, and AEC mode based upon breast tissue density, compressed thickness, and patient characteristics.	IP.1.E.
54.	Consult with an MQSA qualified interpreting physician to review image quality and positioning and establish corrective procedures per EQUIP regulations.	IP.1.C.2.E.
55.	Verify mammographic image identification according to ACR guidelines.	IP.1.E.1.J.
56.	Verify image is of diagnostic quality, and take corrective action as needed.	IP.1.E.2.
57.	Locate an area of interest using triangulation.	P.1.A.3.
	Position patient and equipment to obtain the following mammographic views:	
58.	craniocaudal (CC)	P.2.A.1.
59.	mediolateral oblique (MLO)	P.2.A.2.
60.	90° mediolateral (ML)	P.2.A.3.
61.	90° lateromedial (LM)	P.2.A.4.
62.	exaggerated craniocaudal lateral (XCCL)	P.2.A.5.
63.	exaggerated craniocaudal medial (XCCM)	P.2.A.5.
64.	cleavage (CV)	P.2.A.6.
65.	axillary tail (AT)	P.2.A.7.
66.	tangential (TAN)	P.2.A.8.
67.	rolled views (RL, RM, RI, RS)	P.2.A..9.
68.	implant displaced views (CCID, MLOID)	P.2.A.10.
	Position patient and equipment to obtain the following mammographic views: (continued)	

Activity		Content Categories Legend: PC = Patient Care, IP = Image Production, P = Procedures
69.	nipple in profile	P.2.A.11.
70.	anterior compression	P.2.A.12.
71.	spot compression	P.2.A.13.
72.	magnification	P.2.A.14.
73.	Verify informed consent as necessary.	P.2.D.1.
74.	Use sterile or aseptic technique when indicated.	P.2.D.2.
75.	Follow environmental protection standards for handling and disposing of biohazardous materials (e.g., sharps, blood, body fluids).	P.2.D.3.
	Assist with the following interventional procedures and associated imaging:	
76.	ultrasound core biopsy with clip placement	P.2.D.2.A.1.
77.	stereotactic core biopsy with clip placement	P.2.D.2.A.2.
78.	cyst aspiration	P.2.D.2.B.
79.	fine needle aspiration biopsy	P.2.D.2.C.
80.	needle/wire localization	P.2.D.2.D.
	Perform the following interventional imaging:	
81.	breast specimen imaging	P.2.D.2.E.1.
82.	tissue marker clip placement imaging	P.2.D.2.E.3.
	Educate (e.g., purpose) patients about the following breast imaging modalities:	
83.	digital breast tomosynthesis (DBT/3D)	P.2.C.
84.	breast ultrasound	P.2.C.2.
85.	breast MRI	P.2.C.3.