

**American College of Radiology
ACR Appropriateness Criteria®**

Breast Implant Evaluation

Variant 1: Adult of any age. Female or transfeminine. Evaluation of saline breast implants. Asymptomatic. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Mammography screening	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	12	0	1	0	0	0	1	0	1
		References		Study Quality											
		15 (34794604)		4											
		14 (29101979)		4											
MRI breast without IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	13	1	0	1	0	0	0	0	0
		References		Study Quality											
		16 (24792659)		4											
MRI breast without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	0	1	0	0	0	0	1
		References		Study Quality											
		16 (24792659)		4											
US breast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	12	1	0	0	0	0	0	0	0
Digital breast tomosynthesis screening	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	11	0	2	1	0	0	0	0	1
		References		Study Quality											
		15 (34794604)		4											
		14 (29101979)		4											

Variant 2: Adult younger than 30 years of age. Female or transfeminine. Evaluation of saline breast implants. Clinical examination equivocal for implant rupture. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US breast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	8	8	0	1	0	1	1	0	2	4	6
		References		Study Quality											
		18 (28186859)		4											
Mammography diagnostic	Usually not appropriate	Limited	☼☼ 0.1-1mSv		3	3	7	0	4	0	3	0	0	0	1
		References		Study Quality											
		16 (24792659)		4											
		17 (16579024)		4											
MRI breast without IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	0	0	2	0	0	0	0
		References		Study Quality											
		16 (24792659)		4											
MRI breast without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	0	0	2	0	0	0	0
		References		Study Quality											
		16 (24792659)		4											
Digital breast tomosynthesis diagnostic	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	9	0	3	0	1	0	0	0	0
		References		Study Quality											
		16 (24792659)		4											
		17 (16579024)		4											

Variant 3: Adult 30 to 39 years of age. Female or transfeminine. Evaluation of saline breast implants. Clinical examination equivocal for implant rupture. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
US breast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	8	8	0	1	0	0	2	0	3	4	5	
		References	Study Quality													
		18 (28186859)	4													
Mammography diagnostic	May be appropriate (Disagreement)	Expert Opinion	☼☼ 0.1-1mSv		5	5	0	0	2	0	3	2	0	6	0	
		References	Study Quality													
		16 (24792659)	4													
		17 (16579024)	4													
Digital breast tomosynthesis diagnostic	May be appropriate (Disagreement)	Expert Opinion	☼☼ 0.1-1mSv		5	5	0	0	2	0	3	2	0	6	0	
		References	Study Quality													
		16 (24792659)	4													
		17 (16579024)	4													
MRI breast without IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	12	0	1	0	2	0	0	0	0	
		References	Study Quality													
		16 (24792659)	4													
MRI breast without and with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	13	0	0	0	2	0	0	0	0	
		References	Study Quality													
		16 (24792659)	4													

Variant 4: Adult age 40 years or older. Female or transfeminine. Evaluation of saline breast implants. Clinical examination equivocal for implant rupture. Initial imaging.

			20 (23928244)		4													
			19 (15900139)		4													
			18 (28186859)		4													
			15 (34794604)		4													
			14 (29101979)		4													
MRI breast without IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	12	0	1	0	0	0	0	0	0	0	0	0
		References	Study Quality															
		1 (-3195188)	4															
MRI breast without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	13	0	0	0	0	0	0	0	0	0	0	0
US breast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	11	0	1	0	0	0	0	0	0	1	0	0
		References	Study Quality															
		1 (-3195188)	4															
Digital breast tomosynthesis diagnostic	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	12	0	0	0	0	0	0	0	1	0	0	0
		References	Study Quality															
		20 (23928244)	4															
		19 (15900139)	4															
		18 (28186859)	4															
		15 (34794604)	4															
		14 (29101979)	4															

Variant 6: Adult of any age. Female or transfeminine. Evaluation of silicone breast implants. Asymptomatic. Initial imaging at 5 to 6 years after implant placement and follow-up imaging every 2 to 3 years after initial negative imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations												
							1	2	3	4	5	6	7	8	9				
MRI breast without IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	9	9	1	0	0	0	1	1	0	1	9				

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations												
							1	2	3	4	5	6	7	8	9				

References	Study Quality
28 (15664285)	2
27 (25028829)	3
26 (15257358)	2
25 (22751081)	1
24 (16874191)	3
23 (17051096)	3
22 (17898620)	2
21 (18349629)	4
16 (24792659)	4
1 (-3195188)	4

US breast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	3	2	3	2	3
-----------	---------------------	--------	---------	---------------	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
34 (19054000)	3
33 (23668948)	3
32 (22328687)	2
31 (21427311)	4
30 (23623260)	4
29 (18090814)	4
27 (25028829)	3
26 (15257358)	2
18 (28186859)	4
1 (-3195188)	4
14 (29101979)	4
15 (34794604)	4

16 (24792659)	4
38 (22430679)	3
29 (18090814)	4
31 (21427311)	4
32 (22328687)	2
27 (25028829)	3
26 (15257358)	2
28 (15664285)	2
37 (21364405)	M
35 (23622796)	4
1 (-3195188)	4

US breast	May be appropriate (Disagreement)	Expert Opinion	0 0 mSv	0 0 mSv [ped]	5	5	1	1	0	1	7	1	1	1	1
-----------	-----------------------------------	----------------	---------	---------------	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
29 (18090814)	4
30 (23623260)	4
31 (21427311)	4
32 (22328687)	2
33 (23668948)	3
34 (19054000)	3
27 (25028829)	3
26 (15257358)	2
20 (23928244)	4
35 (23622796)	4
39 (34063687)	2
18 (28186859)	4
36 (-3112870)	4
15 (34794604)	4
14 (29101979)	4
1 (-3195188)	4

Mammography diagnostic	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	12	0	1	0	0	0	0	0	0
------------------------	-------------------------	---------	-------------	--	---	---	----	---	---	---	---	---	---	---	---

References	Study Quality
29 (18090814)	4
31 (21427311)	4
20 (23928244)	4
35 (23622796)	4
19 (15900139)	4
36 (-3112870)	4
15 (34794604)	4
14 (29101979)	4
1 (-3195188)	4

MRI breast without and with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	11	1	1	0	0	0	0	0	0
---	-------------------------	---------	---------	---------------	---	---	----	---	---	---	---	---	---	---	---

References	Study Quality
36 (-3112870)	4
15 (34794604)	4
14 (29101979)	4
1 (-3195188)	4

Digital breast tomosynthesis diagnostic	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	12	0	1	0	0	0	0	0	0
---	-------------------------	---------	-------------	--	---	---	----	---	---	---	---	---	---	---	---

References	Study Quality
29 (18090814)	4
31 (21427311)	4
20 (23928244)	4
35 (23622796)	4
19 (15900139)	4
1 (-3195188)	4
36 (-3112870)	4
15 (34794604)	4
14 (29101979)	4

		36 (-3112870)		4														
US breast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	5	5	0	1	0	1	7	1	2	2	0			

References	Study Quality
29 (18090814)	4
30 (23623260)	4
31 (21427311)	4
32 (22328687)	2
33 (23668948)	3
34 (19054000)	3
27 (25028829)	3
26 (15257358)	2
20 (23928244)	4
35 (23622796)	4
39 (34063687)	2
18 (28186859)	4
36 (-3112870)	4
15 (34794604)	4
14 (29101979)	4
1 (-3195188)	4

Digital breast tomosynthesis diagnostic	May be appropriate (Disagreement)	Expert Opinion	☼☼ 0.1-1mSv		5	5	2	0	2	1	4	1	1	1	1			
---	-----------------------------------	----------------	-------------	--	---	---	---	---	---	---	---	---	---	---	---	--	--	--

References	Study Quality
19 (15900139)	4
1 (-3195188)	4
14 (29101979)	4
15 (34794604)	4
36 (-3112870)	4

MRI breast without and with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	12	0	1	0	1	0	1	0	0			
---	-------------------------	---------	---------	---------------	---	---	----	---	---	---	---	---	---	---	---	--	--	--

References	Study Quality
------------	---------------

1 (-3195188)	4
14 (29101979)	4
15 (34794604)	4
36 (-3112870)	4

Variant 9: Adult age 40 years or older. Female or transfeminine. Evaluation of silicone breast implants. Suspected implant complication. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI breast without IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	9	9	1	0	0	0	1	0	1	4	8

References	Study Quality
16 (24792659)	4
38 (22430679)	3
29 (18090814)	4
31 (21427311)	4
32 (22328687)	2
37 (21364405)	M
35 (23622796)	4
28 (15664285)	2
27 (25028829)	3
26 (15257358)	2
1 (-3195188)	4

Mammography diagnostic	May be appropriate (Disagreement)	Expert Opinion	⊕⊕ 0.1-1mSv		5	5	2	0	1	1	2	1	3	1	2
------------------------	-----------------------------------	----------------	-------------	--	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
29 (18090814)	4
30 (23623260)	4
31 (21427311)	4
20 (23928244)	4

35 (23622796)	4
19 (15900139)	4
36 (-3112870)	4
15 (34794604)	4
14 (29101979)	4
1 (-3195188)	4

US breast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	5	5	0	1	0	1	7	1	2	2	0
-----------	--------------------	--------	---------	---------------	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
29 (18090814)	4
30 (23623260)	4
31 (21427311)	4
32 (22328687)	2
33 (23668948)	3
34 (19054000)	3
27 (25028829)	3
26 (15257358)	2
20 (23928244)	4
35 (23622796)	4
39 (34063687)	2
36 (-3112870)	4
15 (34794604)	4
14 (29101979)	4
1 (-3195188)	4

Digital breast tomosynthesis diagnostic	May be appropriate (Disagreement)	Expert Opinion	⊕⊕ 0.1-1mSv		5	5	2	0	1	1	2	1	3	1	2
---	-----------------------------------	----------------	-------------	--	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
29 (18090814)	4
30 (23623260)	4
31 (21427311)	4
20 (23928244)	4

		35 (23622796)		4														
		19 (15900139)		4														
		36 (-3112870)		4														
		15 (34794604)		4														
		14 (29101979)		4														
		1 (-3195188)		4														
MRI breast without and with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	12	0	1	0	1	0	1	0	1	0	0	
		References		Study Quality														
		36 (-3112870)		4														
		15 (34794604)		4														
		14 (29101979)		4														
		1 (-3195188)		4														

Variant 10: Adult younger than 30 years of age. Female or transfeminine. Evaluation of unexplained axillary adenopathy. Silicone breast implants (current or prior). Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations											
							1	2	3	4	5	6	7	8	9			
US breast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	9	9	0	1	0	0	1	0	1	2	10			
		References		Study Quality														
		30 (23623260)		4														
Digital breast tomosynthesis diagnostic	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		2	2	7	3	1	2	1	0	0	0	1			
Mammography diagnostic	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	8	2	1	2	2	0	0	0	0			
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	10	2	1	0	0	0	0	0	0			

MRI breast without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	10	1	1	0	1	0	0	0	0
---	-------------------------	------------------	---------	---------------	---	---	----	---	---	---	---	---	---	---	---

Variant 11: Adult 30 to 39 years of age. Female or transfeminine. Evaluation of unexplained axillary adenopathy. Silicone breast implants (current or prior). Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US breast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	9	9	0	1	0	0	1	0	2	3	8

References	Study Quality
30 (23623260)	4
39 (34063687)	2

Mammography diagnostic	Usually appropriate	Expert Consensus	☼☼ 0.1-1mSv		8	8	0	0	0	0	0	0	3	6	4
Digital breast tomosynthesis diagnostic	Usually appropriate	Expert Consensus	☼☼ 0.1-1mSv		8	8	0	0	0	0	0	0	3	6	4
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	2	2	5	6	1	0	0	0	1	0	0
MRI breast without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	7	4	0	1	1	0	0	0	0

Variant 12: Adult age 40 years or older. Female or transfeminine. Evaluation of unexplained axillary adenopathy. Silicone breast implants (current or prior). Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Mammography diagnostic	Usually appropriate	Expert Consensus	☼☼ 0.1-1mSv		9	9	0	0	0	0	0	0	3	2	8
US breast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	9	9	0	1	0	0	2	0	2	2	8

References	Study Quality
30 (23623260)	4
39 (34063687)	2

Digital breast tomosynthesis diagnostic	Usually appropriate	Expert Consensus	⊕⊕ 0.1-1mSv		9	9	0	0	0	0	0	0	3	2	8
MRI breast without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	6	4	0	1	2	0	0	0	0
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	7	4	1	0	0	0	1	0	0

Variant 13: Adult of any age. Female or transfeminine. Suspected breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) (delayed seroma, swelling, mass, pain, but no erythema, warmth, or skin changes that would raise concern for inflammatory breast cancer or mastitis). Breast implant of any type. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US breast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	9	9	0	1	0	0	0	0	1	2	11

References	Study Quality
11 (25073777)	3
49 (26598546)	3
48 (25490539)	4
47 (28402426)	4
46 (26936251)	4
45 (-3195205)	4
44 (21441845)	4
43 (33554880)	4
13 (32302264)	4
9 (33234792)	4
8 (28184418)	4
4 (28918365)	4

Appendix Key

A more complete discussion of the items presented below can be found by accessing the supporting documents at the designated hyperlinks.

Appropriateness Category: The panel's recommendation for a procedure based on the assessment of the risks and benefits of performing the procedure for the specified clinical scenario.

SOE: Strength of Evidence. The assessment of the amount and quality of evidence found in the peer reviewed medical literature for an appropriateness recommendation.

- **References:** The citation number and PMID for the reference(s) associated with the recommendation.
- **Study Quality:** The assessment of the quality of an individual reference based on the number of study quality elements described in the reference.

RRL: Relative Radiation Level. A population based assessment of the amount of radiation a typical patient may be exposed to during the specified procedure.

Rating: The final rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Median: The median rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Final tabulations: A histogram showing the number of panel members who rated the procedure as noted in the column heading (ie, 1, 2, 3, etc.).

Additional supporting documents about the AC methodology and processes can be found at www.acr.org/ac.