

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

**Female Breast Cancer Screening**

**Variant 1: Adult female. Breast cancer screening. Average risk.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Mammography screening	Usually appropriate	Strong	⊕⊕ 0.1-1mSv		9	9	0	0	0	0	0	0	3	4	15

References	Study Quality
40 (33223001)	4
39 (28411671)	4
37 (27754936)	4
36 (29267146)	4
35 (25413699)	Inadequate
34 (33650900)	3
33 (33141657)	3
32 (21257850)	4
31 (25415718)	4
27 (16775176)	Good
26 (29571797)	2
8 (34154984)	4
6 (-3196037)	4
5 (26501536)	4
2 (24450666)	3
3 (37150275)	4
28 (20868890)	4
1 (21712474)	1

7 (26757170)	4
41 (26204111)	4
38 (28648873)	4

Digital breast tomosynthesis screening	Usually appropriate	Strong	☹☹ 0.1-1mSv		9	9	0	0	0	0	0	0	3	1	18
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References	Study Quality
34 (33650900)	3
33 (33141657)	3
32 (21257850)	4
31 (25415718)	4
30 (33706172)	Good
29 (28516226)	Good
27 (16775176)	Good
26 (29571797)	2
25 (32721031)	3
24 (28083822)	1
23 (25599513)	2
22 (30777808)	3
20 (29869961)	1
18 (30107542)	Good
17 (31078459)	1
8 (34154984)	4
6 (-3196037)	4
5 (26501536)	4
28 (20868890)	4
35 (25413699)	Inadequate
14 (25058084)	3
15 (24918774)	3
16 (23901124)	3
19 (25313245)	2
21 (23297332)	1

MRI breast without and with IV contrast	May be appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	5	5	0	0	3	4	12	2	0	0	0
		References	Study Quality												
		10 (34794600)	4												
		44 (3528677)	4												
		43 (31774954)	Good												
		42 (28221097)	1												
		28 (20868890)	4												
US breast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	5	5	0	1	2	3	10	5	0	0	1
		References	Study Quality												
		49 (22723501)	2												
		10 (34794600)	4												
		56 (24951614)	3												
		55 (34406400)	2												
		54 (29736009)	Good												
		53 (33434108)	3												
		52 (34134531)	4												
		51 (27501888)	1												
		50 (30316869)	1												
		40 (33223001)	4												
		27 (16775176)	Good												
		26 (29571797)	2												
MRI breast without and with IV contrast abbreviated	May be appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	5	5	0	0	2	4	13	2	0	0	0
		References	Study Quality												
		10 (34794600)	4												
		45 (32096852)	1												
		28 (20868890)	4												
Mammography with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		3	3	3	3	8	1	6	0	1	0	0

		References	Study Quality											
		10 (34794600)	4											
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	19	0	1	2	0	0	0	0
Sestamibi MBI	Usually not appropriate	Limited	⊗⊗⊗ 1-10 mSv		1	1	12	1	5	3	0	0	1	0
		References	Study Quality											
		48 (32524221)	2											
		47 (31880677)	4											
		46 (27186635)	3											
		40 (33223001)	4											
MRI breast without IV contrast abbreviated	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	19	0	1	2	0	0	0	0

**Variant 2: Adult female. Breast cancer screening. Intermediate risk.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Mammography screening	Usually appropriate	Strong	⊗⊗ 0.1-1mSv		9	9	0	0	0	0	0	0	3	3	16
		References	Study Quality												
		41 (26204111)	4												
		40 (33223001)	4												
		39 (28411671)	4												
		37 (27754936)	4												
		36 (29267146)	4												
		35 (25413699)	Inadequate												
		34 (33650900)	3												
		33 (33141657)	3												
		32 (21257850)	4												

31 (25415718)	4
27 (16775176)	Good
26 (29571797)	2
8 (34154984)	4
7 (26757170)	4
5 (26501536)	4
2 (24450666)	3
1 (21712474)	1
6 (-3196037)	4
3 (37150275)	4
28 (20868890)	4
38 (28648873)	4

Digital breast tomosynthesis screening	Usually appropriate	Strong	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	0	2	2	18
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References	Study Quality
40 (33223001)	4
35 (25413699)	Inadequate
34 (33650900)	3
33 (33141657)	3
32 (21257850)	4
31 (25415718)	4
30 (33706172)	Good
29 (28516226)	Good
27 (16775176)	Good
26 (29571797)	2
25 (32721031)	3
24 (28083822)	1
23 (25599513)	2
22 (30777808)	3
20 (29869961)	1
18 (30107542)	Good

17 (31078459)	1
8 (34154984)	4
6 (-3196037)	4
5 (26501536)	4
3 (37150275)	4
14 (25058084)	3
15 (24918774)	3
16 (23901124)	3
19 (25313245)	2
21 (23297332)	1
38 (28648873)	4

MRI breast without and with IV contrast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	0	8	11	2	0	0
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References	Study Quality
69 (27097237)	4
68 (31221620)	3
67 (32303988)	Inadequate
66 (28655029)	3
65 (31063080)	3
64 (19884532)	1
63 (25794083)	4
62 (20177029)	1
61 (22474203)	1
70 (24934793)	3

MRI breast without and with IV contrast abbreviated	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	0	8	12	1	0	0
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References	Study Quality
45 (32096852)	1
53 (33434108)	3
75 (28506511)	4
74 (25454099)	2



MRI breast without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	19	0	2	0	1	0	0	0	0	
MRI breast without IV contrast abbreviated	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	19	0	2	0	1	0	0	0	0	

**Variant 3: Adult female. Breast cancer screening. High risk.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Mammography screening	Usually appropriate	Strong	⊕⊕ 0.1-1mSv		9	9	0	0	0	0	0	0	3	2	17

References	Study Quality
81 (28886475)	Inadequate
80 (27444927)	4
79 (26908327)	Inadequate
41 (26204111)	4
40 (33223001)	4
39 (28411671)	4
37 (27754936)	4
36 (29267146)	4
35 (25413699)	Inadequate
34 (33650900)	3
33 (33141657)	3
32 (21257850)	4
31 (25415718)	4
27 (16775176)	Good
26 (29571797)	2
8 (34154984)	4



7 (26757170)	4
5 (26501536)	4
2 (24450666)	3
1 (21712474)	1
6 (-3196037)	4
3 (37150275)	4
38 (28648873)	4

MRI breast without and with IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	9	9	0	0	1	0	0	1	4	1	15
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References	Study Quality
61 (22474203)	1
62 (20177029)	1
64 (19884532)	1
4 (17392385)	4
81 (28886475)	Inadequate
70 (24934793)	3
69 (27097237)	4
68 (31221620)	3
67 (32303988)	Inadequate
66 (28655029)	3
65 (31063080)	3
63 (25794083)	4
40 (33223001)	4
3 (37150275)	4

Digital breast tomosynthesis screening	Usually appropriate	Strong	☼☼ 0.1-1mSv		9	9	0	0	0	0	0	0	2	1	19
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References	Study Quality
80 (27444927)	4
79 (26908327)	Inadequate
40 (33223001)	4
35 (25413699)	Inadequate

34 (33650900)	3
33 (33141657)	3
32 (21257850)	4
31 (25415718)	4
30 (33706172)	Good
29 (28516226)	Good
27 (16775176)	Good
26 (29571797)	2
25 (32721031)	3
24 (28083822)	1
23 (25599513)	2
22 (30777808)	3
20 (29869961)	1
18 (30107542)	Good
17 (31078459)	1
8 (34154984)	4
6 (-3196037)	4
5 (26501536)	4
3 (37150275)	4
14 (25058084)	3
15 (24918774)	3
16 (23901124)	3
19 (25313245)	2
21 (23297332)	1

MRI breast without and with IV contrast abbreviated	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	4	5	10	1	1
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References	Study Quality
4 (17392385)	4
75 (28506511)	4
74 (25454099)	2
73 (31206889)	3

			72 (33620293)		3													
			3 (37150275)		4													
US breast	May be appropriate (Disagreement)	Expert Opinion	0 0 mSv	0 0 mSv [ped]	5	5	1	1	3	1	9	3	3	0	0			
			References		Study Quality													
			61 (22474203)		1													
			82 (16293877)		2													
			76 (30098212)		3													
			66 (28655029)		3													
			64 (19884532)		1													
			63 (25794083)		4													
			62 (20177029)		1													
			10 (34794600)		4													
Mammography with IV contrast	May be appropriate (Disagreement)	Expert Opinion	☼☼ 0.1-1mSv		5	5	0	1	2	1	3	6	7	0	1			
			References		Study Quality													
			60 (31453765)		2													
			59 (30240292)		2													
			58 (31092346)		2													
			57 (33787291)		3													
Sestamibi MBI	Usually not appropriate	Limited	☼☼☼ 1-10 mSv		2	2	11	1	4	1	3	1	0	0	1			
			References		Study Quality													
			40 (33223001)		4													
			47 (31880677)		4													
			48 (32524221)		2													
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	19	0	2	0	0	1	0	0	0			
MRI breast without IV contrast abbreviated	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	19	0	2	0	0	1	0	0	0			

## **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](http://www.acr.org/ac).