American College of Radiology
ACR Appropriateness Criteria®

Imaging after Breast Surgery

Variant 1: Female. Age 40 years or older. Postsurgical excision with nonmalignant pathology. 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 appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	0	0	0	17

References	Study Quality
1 (28648873)	4
18 (20601590)	3
17 (-3194409)	4

Digital breast tomosynthesis screening	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	0	0	0	17

References	Study Quality
1 (28648873)	4
18 (20601590)	3
17 (-3194409)	4

MRI breast without and with IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	3	0	1	0	12	1	0	0	0
Mammography diagnostic	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	12	4	1	0	0	0	0	0	0

References	Study Quality
11 (30172804)	4
13 (29299726)	4
12 (25423143)	3

15 (26492902)	4
20 (31825261)	4
16 (24639339)	4
14 (27425222)	4
42 (-3194411)	4

MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
FDG-PET breast dedicated	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	17	0	0	0	0	0	0	0	0
US breast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	4	0	1	1	0	0	0	0
Digital breast tomosynthesis diagnostic	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	9	6	2	0	0	0	0	0	0

References	Study Quality
11 (30172804)	4
13 (29299726)	4
12 (25423143)	3
15 (26492902)	4
16 (24639339)	4
14 (27425222)	4
42 (-3194411)	4

Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	17	0	0	0	0	0	0	0	0

Variant 2: Female. Age 30 to 39 years. Postsurgical excision with nonmalignant pathology. Asymptomatic. 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 and with IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	4	1	1	2	9	0	0	0	0

Mammography screening	May be appropriate	Limited	☢☢ 0.1-1mSv		4	4	4	1	2	5	5	0	0	0	0

References	Study Quality
1 (28648873)	4
17 (-3194409)	4

Digital breast tomosynthesis screening	May be appropriate	Limited	☢☢ 0.1-1mSv		4	4	5	1	1	4	6	0	0	0	0

References	Study Quality
1 (28648873)	4
17 (-3194409)	4

Mammography diagnostic	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	14	3	0	0	0	0	0	0	0
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
FDG-PET breast dedicated	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	17	0	0	0	0	0	0	0	0
US breast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	3	2	2	0	0	0	0	0
Digital breast tomosynthesis diagnostic	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	13	4	0	0	0	0	0	0	0
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	17	0	0	0	0	0	0	0	0

Variant 3: Adult female younger than 30 years of age. Postsurgical excision with nonmalignant pathology. 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 diagnostic	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	17	0	0	0	0	0	0	0	0

Mammography screening	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	17	0	0	0	0	0	0	0	0
	References		Study Quality												
	1 (28648873)		4												
	17 (-3194409)		4												
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
MRI breast without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	3	1	0	0	0	0	0
FDG-PET breast dedicated	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	17	0	0	0	0	0	0	0	0
US breast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	1	0	0	0	1	0	0	0
Digital breast tomosynthesis diagnostic	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	17	0	0	0	0	0	0	0	0
Digital breast tomosynthesis screening	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	17	0	0	0	0	0	0	0	0
	References		Study Quality												
	1 (28648873)		4												
	17 (-3194409)		4												
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	17	0	0	0	0	0	0	0	0

Variant 4: Adult female. Postsurgical excision for breast cancer. Positive margins. 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 diagnostic	May be appropriate	Strong	☢☢ 0.1-1mSv		5	5	0	0	0	0	9	5	2	1	0

References	Study Quality
25 (24674371)	2
24 (31182403)	2

MRI breast without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	1	9	5	1	0	1

References	Study Quality
26 (25091598)	3
27 (20545940)	4
24 (31182403)	2

Digital breast tomosynthesis diagnostic	May be appropriate (Disagreement)	Expert Opinion	☢☢ 0.1-1mSv		5	5	6	0	0	1	5	4	0	1	0
Mammography screening	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	14	0	0	0	0	0	1	1	0
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	2	0	0	0	0	0	0	0
FDG-PET breast dedicated	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	12	2	1	0	0	0	0	0	1
US breast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	1	1	3	1	0	0	0	0
Digital breast tomosynthesis screening	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	12	1	1	0	0	1	1	0	0
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	1	1	0	0	0	0	0	0

Variant 5: Adult female. Surveillance following completion of breast conservation therapy for breast cancer. Negative margins. With or without radiation. Asymptomatic.

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	Limited	☢☢ 0.1-1mSv		9	9	0	0	1	0	1	0	2	3	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
36 (25904721)	3
40 (24113745)	3
57 (22692036)	3
34 (29748762)	3
43 (29064749)	4
59 (27163158)	3
44 (31685110)	4
45 (29450753)	4
53 (28822394)	4
37 (28341031)	4
46 (22005943)	4
47 (20091247)	4
48 (28749724)	3
23 (27810132)	4
30 (22872291)	3
58 (31313678)	3
54 (29102277)	4
49 (29353367)	4
33 (23860534)	4
35 (29718790)	4
50 (23408106)	4
55 (21951942)	4
41 (24106867)	3
22 (20956827)	4
56 (28675577)	4
28 (30207076)	4

Mammography screening	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	1	0	0	0	0	0	2	14

References	Study Quality
61 (32529566)	3
60 (33350890)	3
52 (-3194403)	4
51 (-3194405)	4
42 (-3194411)	4
36 (25904721)	3
40 (24113745)	3
57 (22692036)	3
34 (29748762)	3
43 (29064749)	4
59 (27163158)	3
44 (31685110)	4
45 (29450753)	4
53 (28822394)	4
37 (28341031)	4
46 (22005943)	4
47 (20091247)	4
48 (28749724)	3
23 (27810132)	4
30 (22872291)	3
58 (31313678)	3
54 (29102277)	4
49 (29353367)	4
33 (23860534)	4
35 (29718790)	4
50 (23408106)	4
55 (21951942)	4
41 (24106867)	3

Digital breast tomosynthesis screening	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	1	0	0	0	0	1	5	10

References	Study Quality
22 (20956827)	4
56 (28675577)	4
28 (30207076)	4
61 (32529566)	3
60 (33350890)	3
52 (-3194403)	4
51 (-3194405)	4
36 (25904721)	3
40 (24113745)	3
57 (22692036)	3
34 (29748762)	3
43 (29064749)	4
59 (27163158)	3
44 (31685110)	4
67 (31161975)	4
45 (29450753)	4
53 (28822394)	4
37 (28341031)	4
46 (22005943)	4
47 (20091247)	4
48 (28749724)	3
23 (27810132)	4
30 (22872291)	3
58 (31313678)	3
54 (29102277)	4
49 (29353367)	4
33 (23860534)	4
35 (29718790)	4

Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		8	8	1	0	0	0	2	0	2	4	7

References	Study Quality
50 (23408106)	4
55 (21951942)	4
41 (24106867)	3
22 (20956827)	4
56 (28675577)	4
28 (30207076)	4
61 (32529566)	3
60 (33350890)	3
52 (-3194403)	4
51 (-3194405)	4
36 (25904721)	3
40 (24113745)	3
57 (22692036)	3
34 (29748762)	3
43 (29064749)	4
59 (27163158)	3
44 (31685110)	4
45 (29450753)	4
53 (28822394)	4
37 (28341031)	4
46 (22005943)	4
47 (20091247)	4
48 (28749724)	3
23 (27810132)	4
30 (22872291)	3
58 (31313678)	3
54 (29102277)	4
49 (29353367)	4

33 (23860534)	4
35 (29718790)	4
50 (23408106)	4
55 (21951942)	4
41 (24106867)	3
22 (20956827)	4
56 (28675577)	4
28 (30207076)	4
61 (32529566)	3
60 (33350890)	3
52 (-3194403)	4
51 (-3194405)	4
42 (-3194411)	4

MRI breast without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	1	8	3	4	0	0

References	Study Quality
69 (29357842)	3
65 (28700966)	4
70 (26142951)	3
67 (31161975)	4
71 (20605594)	3
68 (31738203)	3
62 (26400412)	3

US breast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	4	4	5	2	1	1	5	1	1	0	0

References	Study Quality
75 (26663035)	3
77 (23695431)	3
73 (28786298)	4
74 (27184247)	3
72 (31038406)	3

		76 (21208726)			3										
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	0	1	0	0	0	1	0	0
FDG-PET breast dedicated	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	0	0	1	0	0	0	0	1
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	15	0	0	0	0	0	0	1	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.**