

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

## Breast Imaging During Pregnancy

**Variant 1: Pregnant female. Age 40 years or older. Breast cancer screening. Any 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	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	0	1	3	11
		References		Study Quality											
		2 (32755376)		4											
		17 (34903436)		4											
Digital breast tomosynthesis screening	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	0	2	2	11
		References		Study Quality											
		8 (30392595)		4											
		3 (37708073)		4											
		2 (32755376)		4											
US breast	May be appropriate	Limited	O O mSv	O O mSv [ped]	5	5	0	1	0	2	12	0	0	0	0
		References		Study Quality											
		2 (32755376)		4											
		21 (23116728)		2											
		20 (25329763)		3											
Mammography with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		2	2	7	4	1	1	1	0	0	0	1
		References		Study Quality											

		11 (-3188535)			4													
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	13	1	1	0	0	0	0	0	0	0		
MRI breast without and with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	12	2	0	0	0	0	0	0	0	1		
		References			Study Quality													
		11 (-3188535)			4													
		7 (23345353)			4													
		3 (37708073)			4													
Sestamibi MBI	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	13	1	0	0	0	0	0	0	0	1		
		References			Study Quality													
		18 (-3197536)			4													
		19 (35523526)			4													
MRI breast without and with IV contrast abbreviated	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	13	1	0	0	0	0	0	0	0	1		
		References			Study Quality													
		3 (37708073)			4													
		7 (23345353)			4													
		11 (-3188535)			4													
MRI breast without IV contrast abbreviated	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	13	1	1	0	0	0	0	0	0	0		

**Variant 2: Pregnant female. Age less than 25 years. Breast cancer screening. Higher-than-average risk.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US breast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	2	1	11	0	0	0	0
		References		Study Quality											

			2 (32755376)		4											
			20 (25329763)		3											
			21 (23116728)		2											
Mammography screening	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	11	3	1	0	0	0	0	0	0	0
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	12	1	0	0	0	0	1	0	1	1
MRI breast without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	13	1	0	0	1	0	0	0	0	0
		References	Study Quality													
		3 (37708073)	4													
		7 (23345353)	4													
		11 (-3188535)	4													
Digital breast tomosynthesis screening	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	11	3	1	0	0	0	0	0	0	0
Sestamibi MBI	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	1	0	0	0	0
		References	Study Quality													
		18 (-3197536)	4													
		19 (35523526)	4													
Mammography with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	12	3	0	0	0	0	0	0	0	0
		References	Study Quality													
		11 (-3188535)	4													
MRI breast without and with IV contrast abbreviated	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	12	2	0	0	1	0	0	0	0	0
		References	Study Quality													
		3 (37708073)	4													
		7 (23345353)	4													
		11 (-3188535)	4													





		10 (26341843)		4											
		22 (37236740)		4											
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	13	0	0	0	0	0	1	0	1
MRI breast without and with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	13	1	0	0	1	0	0	0	0
		References		Study Quality											
		3 (37708073)		4											
		7 (23345353)		4											
		11 (-3188535)		4											
Digital breast tomosynthesis diagnostic	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	8	4	1	0	2	0	0	0	0
		References		Study Quality											
		23 (34798561)		4											
		22 (37236740)		4											
		8 (30392595)		4											
		3 (37708073)		4											
		2 (32755376)		4											
Sestamibi MBI	Usually not appropriate	Limited	☼☼☼ 1-10 mSv		1	1	13	1	0	1	0	0	0	0	0
		References		Study Quality											
		18 (-3197536)		4											
		19 (35523526)		4											
Mammography with IV contrast	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	11	2	0	1	1	0	0	0	0
		References		Study Quality											
		11 (-3188535)		4											

**Variant 5: Pregnant female. Age 30 years or older. Focal pain or palpable breast mass. Initial imaging.**



Sestamibi MBI	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	1	0	0	0	0
		References	Study Quality													
		18 (-3197536)	4													
		19 (35523526)	4													
Mammography with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	10	2	1	1	1	0	0	0	0	0
		References	Study Quality													
		11 (-3188535)	4													

**Variant 6: Pregnant female. Age less than 30 years. Clinically suspicious nipple discharge. 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	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	2	12
		References		Study Quality											
		2 (32755376)		4											
		7 (23345353)		4											
Mammography diagnostic	Usually not appropriate	Limited	☢☢☢ 0.1-1mSv		1	1	9	2	2	0	0	2	0	0	0
		References		Study Quality											
		2 (32755376)		4											
		10 (26341843)		4											
		22 (37236740)		4											
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	0	0	1	0	0	0	0	1
MRI breast without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	13	1	0	0	0	0	1	0	0
		References		Study Quality											



[illegible]

**Variant 7: Pregnant female. Age 30 years or older. Clinically suspicious nipple discharge. 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	0	0	0	1	1	2	1	10
		References		Study Quality											
		2 (32755376)		4											
		7 (23345353)		4											

Mammography diagnostic	Usually appropriate	Limited	☢☢☢ 0.1-1mSv		8	8	0	0	0	0	0	1	3	4	7	
		References		Study Quality												
		2 (32755376)		4												
		25 (36436958)		4												
Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	☢☢☢ 0.1-1mSv		8	8	0	0	0	0	0	1	3	4	7	
		References		Study Quality												
		2 (32755376)		4												
		25 (36436958)		4												
		3 (37708073)		4												
		8 (30392595)		4												
		23 (34798561)		4												
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	1	1	13	0	0	0	0	1	0	0	0	1
MRI breast without and with IV contrast	Usually not appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	1	1	13	1	0	0	0	0	0	0	1	0
		References		Study Quality												
		3 (37708073)		4												
		7 (23345353)		4												
		11 (-3188535)		4												
Sestamibi MBI	Usually not appropriate	Limited	☢☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	1	0	0	0	0
		References		Study Quality												
		18 (-3197536)		4												
		19 (35523526)		4												
Mammography with IV contrast	Usually not appropriate	Limited	☢☢☢ 0.1-1mSv		1	1	10	2	0	2	0	0	1	0	0	
		References		Study Quality												
		11 (-3188535)		4												

**Variant 8: Pregnant female. Newly diagnosed breast cancer. Locoregional staging.**

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	0	0	0	0	1	3	11
		References	Study Quality												
		2 (32755376)	4												
US breast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	2	1	1	3	8
		References	Study Quality												
		2 (32755376)	4												
		3 (37708073)	4												
		7 (23345353)	4												
		8 (30392595)	4												
Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	0	0	4	11
		References	Study Quality												
		2 (32755376)	4												
		3 (37708073)	4												
		8 (30392595)	4												
		23 (34798561)	4												
US axilla	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	9	9	1	0	0	0	0	0	1	5	8
		References	Study Quality												
		26 (34469221)	4												
		27 (31714846)	4												
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	12	0	1	0	0	1	0	0	1

MRI breast without and with IV contrast	Usually not appropriate	Limited	0.0 mSv	0.0 mSv [ped]	1	1	13	1	0	0	0	0	0	0	0	1
		References	Study Quality													
		3 (37708073)	4													
		7 (23345353)	4													
		11 (-3188535)	4													
Sestamibi MBI	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	13	0	1	0	1	0	0	0	0	0
		References	Study Quality													
		18 (-3197536)	4													
		19 (35523526)	4													
Mammography with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	9	2	0	1	1	1	0	1	0	0
		References	Study Quality													
		11 (-3188535)	4													

**Variant 9: Pregnant female. Breast infection or abscess suspected. Initial imaging.**

Digital breast tomosynthesis diagnostic	May be appropriate	Limited	☢☢ 0.1-1mSv		6	6	0	0	1	1	4	7	0	1	1
		References	Study Quality												
		2 (32755376)	4												
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	1	1	12	1	0	0	1	0	0	0	1
MRI breast without and with IV contrast	Usually not appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	1	1	12	2	0	0	0	0	1	0	0
		References	Study Quality												
		3 (37708073)	4												
		7 (23345353)	4												
		11 (-3188535)	4												
Sestamibi MBI	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	12	2	0	0	1	0	0	0	0
		References	Study Quality												
		18 (-3197536)	4												
		19 (35523526)	4												
Mammography with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	10	4	0	0	0	1	0	0	0
		References	Study Quality												
		11 (-3188535)	4												

**Variant 10: Pregnant female. Palpable breast mass. US findings are probably benign. Next imaging study.**

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	O 0 mSv	O 0 mSv [ped]	9	9	0	0	1	0	0	1	2	1	10
		References	Study Quality												
		2 (32755376)	4												

		7 (23345353)	4												
		28 (32816258)	4												
Image-guided core biopsy breast	Usually not appropriate	Limited	Varies	Varies	2	2	7	5	1	0	1	1	0	0	0
		References	Study Quality												
		2 (32755376)	4												
Mammography diagnostic	Usually not appropriate	Limited	☼☼ 0.1-1mSv		2	2	7	3	2	1	0	2	0	0	0
		References	Study Quality												
		2 (32755376)	4												
Image-guided fine needle aspiration breast	Usually not appropriate	Limited	Varies	Varies	1	1	8	4	1	1	1	0	0	0	0
		References	Study Quality												
		3 (37708073)	4												
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	1	1	13	0	0	0	1	0	0	0	1
MRI breast without and with IV contrast	Usually not appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	1	1	13	1	0	0	0	0	1	0	0
		References	Study Quality												
		3 (37708073)	4												
		7 (23345353)	4												
		11 (-3188535)	4												
Digital breast tomosynthesis diagnostic	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	8	2	2	1	0	2	0	0	0
		References	Study Quality												
		2 (32755376)	4												
		3 (37708073)	4												
		8 (30392595)	4												
		23 (34798561)	4												

US axilla	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	13	1	0	0	1	0	0	0	0	0
Sestamibi MBI	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	14	0	0	0	1	0	0	0	0	0
		References		Study Quality												
		18 (-3197536)		4												
		19 (35523526)		4												
Mammography with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	10	2	2	0	0	0	1	0	0	0
		References		Study Quality												
		11 (-3188535)		4												

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Image-guided core biopsy breast	Usually appropriate	Limited	Varies	Varies	9	9	0	0	0	0	0	0	1	2	12
		References		Study Quality											
		2 (32755376)		4											
Mammography diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	2	1	3	9
		References		Study Quality											
		2 (32755376)		4											
Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	1	1	3	10
		References		Study Quality											
		2 (32755376)		4											
		3 (37708073)		4											
		8 (30392595)		4											

		23 (34798561)			4													
US axilla	Usually appropriate	Expert Consensus	O 0 mSv		O 0 mSv [ped]	9	9	0	0	0	0	0	2	2	3	8		
US breast	Usually appropriate	Limited	O 0 mSv		O 0 mSv [ped]	8	8	1	0	0	0	3	1	1	2	7		
		References			Study Quality													
		2 (32755376)			4													
		7 (23345353)			4													
Image-guided fine needle aspiration breast	May be appropriate	Limited	Varies		Varies	5	5	1	0	0	4	9	0	1	0	0		
		References			Study Quality													
		3 (37708073)			4													
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv		O 0 mSv [ped]	1	1	12	0	1	0	1	0	0	0	1		
MRI breast without and with IV contrast	Usually not appropriate	Limited	O 0 mSv		O 0 mSv [ped]	1	1	13	1	0	0	0	0	0	0	1		
		References			Study Quality													
		3 (37708073)			4													
		7 (23345353)			4													
		11 (-3188535)			4													
Sestamibi MBI	Usually not appropriate	Limited	☢☢☢ 1-10 mSv			1	1	14	0	0	0	1	0	0	0	0		
		References			Study Quality													
		18 (-3197536)			4													
		19 (35523526)			4													
Mammography with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv			1	1	10	2	0	0	2	1	0	0	0		
		References			Study Quality													
		11 (-3188535)			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](http://www.acr.org/ac).