American College of Radiology ACR Appropriateness Criteria®

Breast Imaging of Pregnant and Lactating Women

Variant 1: Breast cancer screening during lactation. Initial imaging.

	Appropriateness	SOE Adults RRL Peds RRL Rating Median							I	inal	Tabu	latio	ns		
Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Mammography screening	Usually appropriate	Limited	�� 0.1-1mS	v	8	8	1	0	0	0	5	0	2	4	4
		References		Study	y Quality										
		10 (23345354)			4										
		9 (18180221)			4										
		7 (24485752)			3										
		13 (23881348)			4										
		14 (15960763)			2										
		24 (21382187)			4										
		38 (17189838)			4										
		37 (29101979)			4										
Digital breast tomosynthesis screening	Usually appropriate	Limited	�� 0.1-1mS	v	8	8	0	1	0	0	4	1	1	2	7
		References		Study	y Quality										
		10 (23345354)			4										
		9 (18180221)			4										
		7 (24485752)			3										
		13 (23881348)			4										
		14 (15960763)			2										
		24 (21382187)			4										

		38 (17189838)			4										
		37 (29101979)			4]								
US breast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	1	2	8	4	0	0	0
		References		Study	y Quality										
		39 (25329763)			3										
		40 (23116728)			2										
MRI breast without and with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	3	3	5	2	3	0	4	2	0	0	0
		References		Study	y Quality			•							
		10 (23345354)			4										
		33 (-3132600)			4										
		3 (17872711)			4										
		7 (24485752)			3										
		34 (16244250)			3]								
		35 (12752635)			4										
		41 (23062742)			4										
		42 (10924585)			3										
		38 (17189838)			4										
		19 (28609163)			2										T
MRI breast without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	15	0	1	0	0	0	0	0	0
		References		Study	y Quality										
		10 (23345354)			4										
		33 (-3132600)			4]								
		3 (17872711)			4										
		7 (24485752)			3										
		34 (16244250)			3										
		35 (12752635)			4										
		41 (23062742)			4										
		42 (10924585)			3]								

		38 (17189838)		4										
		19 (28609163)		 2		-								
Sestamibi MBI	Usually approp	Expert Consensus	��� 1-10 mSv	1	1	15	1	0	0	0	0	0	0	0

Variant 2: Breast cancer screening during pregnancy. Age younger than 30 at high risk. Initial imaging.

	Appropriateness	COF	4.1.4. DD7	D I DD		3.6.11]	Final	Tal	ulatio	ons		
Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Mammography screening	Usually appropriate	Limited	�� 0.1-1mSv		7	7	0	0	0	0	2	0	8	2	4
		References		Study	y Quality		•		•				•	•	
		28 (21343518)			3										
		44 (-3112876)			4										
		7 (24485752)			3										
		24 (21382187)			4										
		25 (21782123)			4										
		26 (12751860)			3										
		27 (8134581)			3										
		43 (22403117)			4										
		45 (9653462)			4										
Digital breast tomosynthesis screening	Usually appropriate	Limited	�� 0.1-1mSv		7	7	1	0	0	0	3	3	3	3	3
		References		Study	y Quality										
		28 (21343518)			3										
		44 (-3112876)			4										
		7 (24485752)			3										
		24 (21382187)			4										
		25 (21782123)			4										
		26 (12751860)			3										

			27 (8134581)				3										
			43 (22403117)				4										
			45 (9653462)				4										
US breast	May approp	be oriate	Limited	O 0 mSv	,	O 0 mSv [ped]	5	5	0	0	1	1	10	4	0	0	0
			References			Study	Quality										
			10 (23345354)				4										
			9 (18180221)				4										
MRI breast without IV contrast	Usuall approp	y not oriate	Limited	O 0 mSv	,	O 0 mSv [ped]	1	1	15	1	0	0	0	0	0	0	0
			References		•	Study	Quality		•								
			33 (-3132600)			_	4										
MRI breast without and with IV contrast	Usuall approp	y not oriate	Limited	O 0 mSv	,	O 0 mSv [ped]	1	1	15	1	0	0	0	0	0	0	0
			References			Study	Quality										
			33 (-3132600)				4										
Sestamibi MBI	Usuall approp		Expert Consensus	≎≎≎ 1-1(mSv	0		1	1	15	1	0	0	0	0	0	0	0

Variant 3: Breast cancer screening during pregnancy. Age 30 to 39 years at elevated risk (intermediate or high risk). Initial imaging.

D 1	Appropriateness	COF	A L L DDI	D I DDI	D 4*	37.11			F	inal '	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Mammography screening	Usually appropriate	Limited	⊕⊕ 0.1-1mSv		7	7	0	0	0	0	1	1	7	3	4

References	Study Quality
28 (21343518)	3
44 (-3112876)	4
7 (24485752)	3
24 (21382187)	4

		25 (21782123)			4										
		26 (12751860)			3										
		27 (8134581)			3										
		43 (22403117)			4										
		45 (9653462)			4										
Digital breast tomosynthesis screening	Usually appropriate	Limited	�� 0.1-1mSv	,	7	7	1	0	0	0	1	4	3	3	4
		References		Study	Quality										
		28 (21343518)			3										
		44 (-3112876)			4										
		7 (24485752)			3										
		24 (21382187)			4										
		25 (21782123)			4										
		26 (12751860)			3										
		27 (8134581)			3										
		43 (22403117)			4										
		45 (9653462)			4										
US breast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	1	2	10	2	0	0	0
		References		Study	Quality										
		10 (23345354)			4										
		9 (18180221)			4										
MRI breast without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	16	0	0	0	0	0	0	0	0
		References		Study	Quality									•	
		33 (-3132600)			4										
MRI breast without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	16	0	0	0	0	0	0	0	0
		References		Study	Quality										
		33 (-3132600)			4										

Sestamibi MBI	Usually not appropriate	Expert Consensus	��� 1-10 mSv		1	1	16	0	0	0	0	0	0	0	0	
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Variant 4: Breast cancer screening during pregnancy. Age 40 years or older, any risk level. Initial imaging.

	Appropri	ateness	COF	4.1.1. DD				3.5.31			F	inal	Tabu	latio	ns		
Procedure	Categ	ory	SOE	Adults RRI	L Peds F	RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Mammography screening	Usua approp	lly riate	Limited	�� 0.1-1m	Sv		9	9	0	0	0	0	1	0	1	3	11
			References			Study	Quality										
			28 (21343518)				3										
			44 (-3112876)				4										
			7 (24485752)				3										
			24 (21382187)				4										
			25 (21782123)				4										
			26 (12751860)			3											
			27 (8134581)			3											
			43 (22403117)			4											
			45 (9653462)				4			1	1	1	1	1			1 1
Digital breast tomosynthesis screening	Usua approp	lly riate	Limited	�� 0.1-1m	Sv		9	9	0	0	0	0	1	0	0	2	13
			References			Study	Quality										
			28 (21343518)				3										
			44 (-3112876)				4										
			7 (24485752)				3										
			24 (21382187)				4										
			25 (21782123)				4										
			26 (12751860)				3										
			27 (8134581)				3										
			43 (22403117)				4										

			45 (9653462)				4										
US breast	May approp	be oriate	Limited	O 0 mSv	/	O 0 mSv [ped]	5	5	1	1	3	1	8	2	0	0	0
			References			Study	Quality		•		•					•	
			10 (23345354)				4										
			9 (18180221)				4										
MRI breast without IV contrast	Usuall approp	y not oriate	Limited	O 0 mSv	/	O 0 mSv [ped]	1	1	16	0	0	0	0	0	0	0	0
			References			Study	Quality		·								
			28 (21343518)				3										
		44 (-3112876) 7 (24485752)			4												
		7 (24485752)				3											
		24 (21382187)			4												
			25 (21782123)				4										
			26 (12751860)				3										
			27 (8134581)				3										
			43 (22403117)				4										
			45 (9653462)				4										
MRI breast without and with IV contrast	Usuall approp	y not oriate	Limited	O 0 mSv	/	O 0 mSv [ped]	1	1	15	1	0	0	0	0	0	0	0
			References			Study	/ Quality										
			33 (-3132600)				4										
Sestamibi MBI	Usuall approp	y not oriate	Expert Consensus	≎⊕⊕ 1-1 mSv	0		1	1	16	0	0	0	0	0	0	0	0

Variant 5: Pregnant women with a palpable breast mass. Initial imaging.

Duo andrum	Appropriateness Category SOE Adults RRL Peds RRL	Datina	Madian			F	inal '	Гаbu	latio	ns					
Procedure		SOE	Adults RRL	Peas RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US breast	Usually	Limited	O 0 mSv	O 0 mSv	9	9	0	0	0	0	0	0	0	0	16

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2			Fabul			8	9
	appropriate			[ped]											
		References		Study	Quality		•								
		10 (23345354)													
		9 (18180221)													
		44 (-3112876)			4										
		7 (24485752)			3										
		23 (15969981)		4											
		24 (21382187)			4										
		25 (21782123)			4										
		26 (12751860)			3										
		46 (16311748)			3										
		47 (16502483)			4										
		36 (28473077)			4			I		ı	1			1	
Mammography diagnostic	May be appropriate	Limited	�� 0.1-1mSv		5	5	0	0	0	0	10	4	1	1	0
		References		Study	Quality										
		28 (21343518)			3										
		44 (-3112876)			4										
		7 (24485752)			3										
		24 (21382187)			4										
		25 (21782123)			4										
		26 (12751860)			3										
		27 (8134581)			3										
		43 (22403117)		1	4										
Digital breast tomosynthesis diagnostic	May be appropriate	Limited	�� 0.1-1mSv		5	5	0	0	0	0	9	5	2	0	0
		References		Study Quality											
		28 (21343518)			3										

		44 (-3112876)				4										
		7 (24485752)				3										
		24 (21382187)				4										
		25 (21782123)			4											
		26 (12751860)			3											
		27 (8134581)				3										
		43 (22403117)			4											
Image-guided core biopsy breast	Usuall approp	Expert Consensus	Varies		Varies	1	1	12	1	1	0	0	2	0	0	0
Image-guided fine needle aspiration breast	Usuall approp	Expert Consensus	Varies		Varies	1	1	12	1	2	1	0	0	0	0	0
MRI breast without IV contrast	Usuall approp	Limited	O 0 mSv	,	O 0 mSv [ped]	1	1	15	0	0	0	1	0	0	0	0
		References			Study	Quality										
		33 (-3132600)			-	4										
MRI breast without and with IV contrast	Usuall approp	Limited	O 0 mSv	,	O 0 mSv [ped]	1	1	16	0	0	0	0	0	0	0	0
		References		Study Quality		•										
		33 (-3132600)		4												
Sestamibi MBI	Usuall approp	Expert Consensus	��� 1-10 mSv	0		1	1	15	0	0	0	1	0	0	0	0

Variant 6: Clinically suspicious nipple discharge during pregnancy. Initial imaging.

Procedure	Appropriateness Category	COE	A L L DDI		D. J. DDI	D - 45	3.6.11	Final Tabulations										
			SOE	Adults RRL	L	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9	
US breast	Usua approp	.*	Limited	O 0 mSv		O 0 mSv [ped]	9	9	0	0	0	0	0	1	0	3	12	
			References			Study	Quality											
			48 (-3112883)				4											

Mammography diagnostic	Usually appropriate	Limited	�� 0.1-1m\$	Sv	7	7	0	0	0	0	3	4	3	4	2
		References		Study	y Quality										
		28 (21343518)			3										
		44 (-3112876)													
		7 (24485752)													
		24 (21382187)		4											
		25 (21782123)		4											
		43 (22403117)		4											
Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	�� 0.1-1m\$			0	0	0	0	3	4	4	3	2	
		References		Study Quality											
		28 (21343518)		3											
		44 (-3112876)			4										
		7 (24485752)			3										
		24 (21382187)			4										
		25 (21782123)			4										
		43 (22403117)			4										
MRI breast without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	16	0	0	0	0	0	0	0	0
		References		Study	y Quality										
		33 (-3132600)			4										
MRI breast without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	16	0	0	0	0	0	0	0	0
		References		Study Quality		•	•	-	-						
		33 (-3132600)		4											
Sestamibi MBI	Usually not appropriate	Expert Consensus	≎≎≎ 1-10 mSv)	1	1	16	0	0	0	0	0	0	0	0

Variant 7: Locoregional staging of newly diagnosed breast cancer during pregnancy. Initial imaging.

D 1	Appropria	teness	COF	4 1 14 DD	-	n i nni	D 41	N. 1.			F	inal '	Tabu	ulations					
Procedure	Catego	ory	SOE	Adults RR	L	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9		
Mammography diagnostic	Usuall appropri	ly iate	Limited	�� 0.1-1m	Sv		9	9	0	0	1	1	0	0	0	2	12		
			References			Study Quality													
			44 (-3112876)			4													
			43 (22403117)			4													
Digital breast tomosynthesis diagnostic	Usuall appropri		Limited	�� 0.1-1m	Sv		9	9	0	1	0	0	0	0	1	2	12		
			References			Study	Quality												
			44 (-3112876)				4												
			43 (22403117)				4												
US axilla	Usuall appropri		Limited	O 0 mSv		O 0 mSv [ped]	9	9	0	0	0	0	2	1	1	1	11		
			References			Study	Quality												
			51 (16484353)		3					•									
US breast	Usually appropri		Strong	O 0 mSv		O 0 mSv [ped]	3	3	3	2	6	1	2	1	1	0	0		
			References			Study	Quality												
			25 (21782123)				4												
			51 (16484353)				3												
			52 (27955877)				2												
			54 (25013439)				3												
			53 (15486214)				3												
MRI breast without IV contrast	Usually appropri		Limited	O 0 mSv		O 0 mSv [ped]	1	1	15	0	0	0	0	0	1	0	0		
			References			Study	Quality												
			33 (-3132600)			4													
			19 (28609163)				2												

MRI breast without and with IV contrast	Usually approp		Limited	O 0 mSv		O 0 mSv [ped]	1	1	15	0	1	0	0	0	0	0	0
			References	References		Study Quality											
		33 (-3132600)			4												
			19 (28609163)				2		_								
Sestamibi MBI	Usually approp		Expert Consensus	≎≎≎ 1-10 mSv)		1	1	15	0	1	0	0	0	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.