American College of Radiology
ACR Appropriateness Criteria®

Monitoring Response to Neoadjuvant Systemic Therapy for Breast Cancer

Variant 1: Initial determination of tumor size and extent within the breast prior to neoadjuvant chemotherapy. Initial imaging examination.

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		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
MRI breast without and with IV contrast	Usually appropriate		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
Mammography diagnostic	Usually appropriate		☢☢ 0.1-1mSv		9	n/a	0	0	0	0	0	0	0	0	0
Digital breast tomosynthesis diagnostic	Usually appropriate		☢☢ 0.1-1mSv		9	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sestamibi MBI	Usually not appropriate		☢☢☢ 1-10 mSv		2	n/a	0	0	0	0	0	0	0	0	0
MRI breast without IV contrast	Usually not appropriate		O 0 mSv	O 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
FDG-PEM	Usually not appropriate		☢☢☢☢ 10-30 mSv		1	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		1	n/a	0	0	0	0	0	0	0	0	0

Variant 2: Imaging of the breast after initiation or completion of neoadjuvant chemotherapy. Initial imaging examination.

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	Usually appropriate		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
US breast	Usually appropriate		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
Mammography diagnostic	Usually appropriate		☢☢ 0.1-1mSv		7	n/a	0	0	0	0	0	0	0	0	0
Digital breast tomosynthesis diagnostic	Usually appropriate		☢☢ 0.1-1mSv		7	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sestamibi MBI	Usually not appropriate		☢☢☢ 1-10 mSv		2	n/a	0	0	0	0	0	0	0	0	0
MRI breast without IV contrast	Usually not appropriate		O 0 mSv	O 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
FDG-PEM	Usually not appropriate		☢☢☢☢ 10-30 mSv		1	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		1	n/a	0	0	0	0	0	0	0	0	0

Variant 3: Known breast cancer. Axillary evaluation prior to neoadjuvant chemotherapy. Initial imaging examination.

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		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
MRI breast without and with IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0

Digital breast tomosynthesis diagnostic	Usually not appropriate		☢☢ 0.1-1mSv		1	n/a	0	0	0	0	0	0	0	0	0
Mammography diagnostic	Usually not appropriate		☢☢ 0.1-1mSv		1	n/a	0	0	0	0	0	0	0	0	0
MRI breast without IV contrast	Usually not appropriate		O 0 mSv	O 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
Image-guided fine needle aspiration breast	Usually not appropriate		Varies	Varies	1	n/a	0	0	0	0	0	0	0	0	0
Image-guided core biopsy breast	Usually not appropriate		Varies	Varies	1	n/a	0	0	0	0	0	0	0	0	0

Variant 4: Known breast cancer. Axillary evaluation after completion of neoadjuvant chemotherapy, axilla not previously evaluated. Initial imaging examination.

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
MRI breast without and with IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	4	n/a	0	0	0	0	0	0	0	0	0
Mammography diagnostic	Usually not appropriate		☢☢ 0.1-1mSv		2	n/a	0	0	0	0	0	0	0	0	0
Digital breast tomosynthesis diagnostic	Usually not appropriate		☢☢ 0.1-1mSv		2	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0
MRI breast without IV contrast	Usually not appropriate		O 0 mSv	O 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0

Variant 5: Known breast cancer with clinical suspicion of metastatic disease. Staging or assessment of response to neoadjuvant chemotherapy. Initial imaging examination.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Tc-99m bone scan whole body	Usually appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually appropriate		☢☢☢☢ 10-30 mSv		9	n/a	0	0	0	0	0	0	0	0	0
CT chest abdomen pelvis with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv		8	n/a	0	0	0	0	0	0	0	0	0
CT chest abdomen pelvis without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv		7	n/a	0	0	0	0	0	0	0	0	0
CT chest abdomen pelvis without IV contrast	Usually not appropriate		☢☢☢☢ 10-30 mSv		1	n/a	0	0	0	0	0	0	0	0	0
MRI chest abdomen pelvis without IV contrast	Usually not appropriate		O 0 mSv	O 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
MRI chest abdomen pelvis without and with IV contrast	Usually not appropriate		O 0 mSv	O 0 mSv [ped]	1	n/a	0	0	0	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.**