American College of Radiology
ACR Appropriateness Criteria®

Evaluation of Nipple Discharge

Variant 1:   **Adult female or male or transfeminine (male-to-female) or transmasculine (female-to-male). Physiologic 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
Image-guided core biopsy breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	1	0	0	0	0	0	0	1
Image-guided fine needle aspiration breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	11	1	1	0	0	0	0	0	1
Mammography diagnostic	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	9	2	1	0	0	1	1	0	0

References	Study Quality
28 ()	3
29 (8167884)	4

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
MRI breast without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	12	2	0	0	0	0	0	0	0

References	Study Quality
28 ()	3
29 (8167884)	4

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
MRI breast without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	12	2	0	0	0	0	0	0	0

References	Study Quality
28 ()	3
29 (8167884)	4

Procedure	Appropriateness Category		RRL	[ped]											
FDG-PET breast dedicated	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	13	0	1	0	0	0	0	0	0

References	Study Quality
28 ()	3
29 (8167884)	4

Procedure	Appropriateness Category		RRL	[ped]											
US breast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	14	0	0	0	0	0	0	0	0

References	Study Quality
28 ()	3
29 (8167884)	4

Procedure	Appropriateness Category		RRL	[ped]											
Digital breast tomosynthesis diagnostic	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	10	2	1	0	0	0	1	0	0

References	Study Quality
28 ()	3
29 (8167884)	4

Procedure	Appropriateness Category		RRL	[ped]											
Ductography	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	12	1	0	0	0	1	0	0	0

References	Study Quality
28 ()	3
29 (8167884)	4

Procedure	Appropriateness Category		RRL	[ped]											
Sestamibi MBI	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	0	0	0	0

References	Study Quality
28 ()	3
29 (8167884)	4
6 (6277258)	4
7 (15467662)	4

Variant 2:   Adult male or female 40 years of age or older. Pathologic 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
Mammography diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	1	0	0	0	0	0	0	3	10

References	Study Quality
31 (20657228)	4
30 (17646365)	3
3 (21116634)	3
9 (26102400)	3
28 ()	3
23 (12648684)	3
16 (16164940)	3
1 (1947092)	4
2 (15908532)	4
34 (18566169)	4
33 (15797293)	4
32 (10887256)	3
11 (-3099474)	4

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
US breast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	1	0	0	0	1	2	10

References	Study Quality
31 (20657228)	4
30 (17646365)	3
38 (10394864)	3
3 (21116634)	3
9 (26102400)	3
23 (12648684)	3
39 (20079481)	3
12 (14634510)	3
17 (12620904)	3
37 (10644102)	3

References	Study Quality
24 (-3099428)	4
40 (30392600)	4

Procedure	Appropriateness														
Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	1	0	0	0	1	0	0	3	9

References	Study Quality
30 (17646365)	3
35 (26133221)	2
36 (33411577)	3

Procedure	Appropriateness														
Image-guided core biopsy breast	Usually not appropriate	Strong	Varies	Varies	1	1	11	0	0	1	1	0	0	1	0

References	Study Quality
54 (17924407)	3
44 (17896158)	3
30 (17646365)	3
52 (26249144)	3
58 (16632727)	3
59 (17090707)	3
60 (20868897)	4
13 (9780989)	3
9 (26102400)	3
23 (12648684)	3
39 (20079481)	3
57 (19565246)	3
61 (26243343)	3
17 (12620904)	3
55 (15756351)	1
56 (10789774)	2
24 (-3099428)	4
40 (30392600)	4

Procedure	Appropriateness														
Image-guided fine needle aspiration breast	Usually not appropriate	Limited	Varies	Varies	1	1	11	0	0	1	1	0	0	1	0

References	Study Quality
54 (17924407)	3
55 (15756351)	1

MRI breast without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	11	2	1	0	0	0	0	0	0

References	Study Quality
48 (25433415)	2
51 (25123174)	3
44 (17896158)	3
52 (26249144)	3
3 (21116634)	3
46 (-3099493)	4
47 (-3099494)	4
49 (25685810)	2
12 (14634510)	3
32 (10887256)	3
50 (18705577)	4

MRI breast without and with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	9	2	1	0	1	1	0	0	0

References	Study Quality
48 (25433415)	2
51 (25123174)	3
44 (17896158)	3
52 (26249144)	3
3 (21116634)	3
46 (-3099493)	4
47 (-3099494)	4
49 (25685810)	2
12 (14634510)	3
32 (10887256)	3
50 (18705577)	4

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
FDG-PET breast dedicated	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	12	1	0	0	0	0	0	0	1

References	Study Quality
41 (16848840)	2
53 (17659240)	3

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Ductography	Usually not appropriate	Strong	☢☢ 0.1-1mSv		1	1	8	2	2	0	1	0	1	0	0

References	Study Quality
44 (17896158)	3
42 (9587119)	4
43 (-3101778)	4
23 (12648684)	3
39 (20079481)	3
16 (16164940)	3
1 (1947092)	4
41 (16848840)	2
45 (11089460)	3

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	0	0	0	0

Variant 3:   Adult male or female 30 to 39 years of age. Pathologic 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
Mammography diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	0	3	1	10

References	Study Quality
64 (17690501)	4
65 (23182522)	3
19 (19735390)	4

63 (23096195)			3											
40 (30392600)			4											

Procedure	Appropriateness	Strength	RRL	RRL [ped]	Median	Median	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	1	0	1	3	9

References	Study Quality
64 (17690501)	4
63 (23096195)	3

Procedure	Appropriateness	Strength	RRL		Median	Median	1	2	3	4	5	6	7	8	9
Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	1	0	3	2	8

References	Study Quality
30 (17646365)	3
35 (26133221)	2
36 (33411577)	3

Procedure	Appropriateness	Strength	RRL		Median	Median	1	2	3	4	5	6	7	8	9
Ductography	Usually not appropriate	Strong	☢☢ 0.1-1mSv		2	2	7	3	3	0	1	0	0	0	0

References	Study Quality
44 (17896158)	3
42 (9587119)	4
43 (-3101778)	4
23 (12648684)	3
39 (20079481)	3
16 (16164940)	3
1 (1947092)	4
41 (16848840)	2
45 (11089460)	3

Procedure	Appropriateness	Strength	RRL	RRL	Median	Median	1	2	3	4	5	6	7	8	9
Image-guided fine needle aspiration breast	Usually not appropriate	Limited	Varies	Varies	1	1	10	2	1	0	0	0	0	0	1

References	Study Quality
54 (17924407)	3
55 (15756351)	1

Procedure	Appropriateness	Strength	Adult Dose	Pediatric Dose										
MRI breast without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	11	2	1	0	0	0	0	0	0

References	Study Quality
48 (25433415)	2
51 (25123174)	3
44 (17896158)	3
52 (26249144)	3
3 (21116634)	3
46 (-3099493)	4
47 (-3099494)	4
49 (25685810)	2
12 (14634510)	3
32 (10887256)	3
50 (18705577)	4

Procedure	Appropriateness	Strength	Adult Dose	Pediatric Dose										
MRI breast without and with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	8	3	2	0	0	1	0	0	0

References	Study Quality
48 (25433415)	2
51 (25123174)	3
44 (17896158)	3
52 (26249144)	3
3 (21116634)	3
46 (-3099493)	4
47 (-3099494)	4
49 (25685810)	2
12 (14634510)	3
32 (10887256)	3
50 (18705577)	4

Procedure	Appropriateness	Strength	Dose											
FDG-PET breast dedicated	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	13	1	0	0	0	0	0	0	0

References	Study Quality

							1	2	3	4	5	6	7	8	9
		41 (16848840)			2										
		53 (17659240)			3										
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	12	1	1	0	0	0	0	0	0

Variant 4: Adult male younger than 30 years of age. Pathologic 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
Mammography diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	1	0	1	5	7
		References		Study Quality											
		1 (1947092)		4											
		2 (15908532)		4											
		40 (30392600)		4											
US breast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	0	0	0	1	3	9
		References		Study Quality											
		3 (21116634)		3											
		40 (30392600)		4											
Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	0	1	5	8
		References		Study Quality											
		30 (17646365)		3											
		35 (26133221)		2											
		36 (33411577)		3											
Image-guided core biopsy breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	11	1	0	0	0	1	0	0	1
Image-guided fine needle aspiration breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	11	1	0	0	1	0	0	0	1

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	1	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	10	3	1	0	0	0	0	0	0
FDG-PET breast dedicated	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	13	1	0	0	0	0	0	0	0
Ductography	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	10	2	1	1	0	0	0	0	0
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	0	0	0	0

Variant 5:   Adult female younger than 30 years of age. Pathologic 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	1	0	0	0	0	0	2	0	11

References	Study Quality
69 (26274736)	3

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Mammography diagnostic	Usually not appropriate	Limited	☢☢ 0.1-1mSv		3	3	2	5	2	0	5	0	0	0	0

References	Study Quality
67 (2267387)	3
68 (3763885)	4

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Digital breast tomosynthesis diagnostic	Usually not appropriate	Limited	☢☢ 0.1-1mSv		3	3	2	5	2	0	5	0	0	0	0

References	Study Quality
30 (17646365)	3
35 (26133221)	2
36 (33411577)	3

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Image-guided core biopsy breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	1	0	0	0	0	0	0	1
Image-guided fine needle aspiration breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	13	0	0	0	0	0	0	0	1
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	2	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	11	2	1	0	0	0	0	0	0
FDG-PET breast dedicated	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	13	1	0	0	0	0	0	0	0
Ductography	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	11	1	1	1	0	0	0	0	0
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	0	0	0	0

Variant 6:   Adult transfeminine (male-to-female) patient 30 years of age or older. Pathologic 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
Mammography diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	1	0	1	0	3	1	8

References	Study Quality
1 (1947092)	4
2 (15908532)	4
40 (30392600)	4

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US breast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	0	0	1	0	3	9

References	Study Quality
3 (21116634)	3

			40 (30392600)		4											
Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	1	0	1	0	4	1	7

	References	Study Quality
	30 (17646365)	3
	35 (26133221)	2
	36 (33411577)	3

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Image-guided core biopsy breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	11	1	1	0	0	0	0	0	1
Image-guided fine needle aspiration breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	1	0	0	0	0	0	0	1
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	1	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	10	2	1	0	0	1	0	0	0
FDG-PET breast dedicated	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	13	1	0	0	0	0	0	0	0
Ductography	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	9	3	1	0	1	0	0	0	0
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	13	0	1	0	0	0	0	0	0

Variant 7:   Adult transfeminine (male-to-female) patient younger than 30 years of age. Pathologic 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
Mammography diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	1	2	4	7
	References	Study Quality													

Procedure	Appropriateness	Evidence	Adult Dose	Pediatric Dose												
		References													
		1 (1947092)	4												
		2 (15908532)	4												
		40 (30392600)	4												
US breast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	0	0	1	0	2	10
		References		Study Quality											
		3 (21116634)	3												
		40 (30392600)	4												
Digital breast tomosynthesis diagnostic	Usually appropriate	Limited	☢☢ 0.1-1mSv		9	9	0	0	0	0	0	0	3	4	7
		References		Study Quality											
		30 (17646365)	3												
		35 (26133221)	2												
		36 (33411577)	3												
Image-guided core biopsy breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	11	2	0	0	0	0	0	1	0
Image-guided fine needle aspiration breast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	1	0	0	0	0	0	1	0
MRI breast without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	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	0	0	0	1	0	0	0
FDG-PET breast dedicated	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	0	0	0	0
Ductography	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	11	2	1	0	0	0	0	0	0
Sestamibi MBI	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	13	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.**