

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

Inflammatory Ear Disease

Variant 1: Adult. Otitis externa, uncomplicated. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT temporal bone without IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv		2	2	8	0	4	2	1	0	1	0	0
		References		Study Quality											
		14 (23351401)		4											
CT head without IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	2	2	8	0	6	1	1	0	0	0	0
		References		Study Quality											
		14 (23351401)		4											
CT temporal bone with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv		1	1	12	0	3	0	0	0	1	0	0
CT temporal bone without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv		1	1	13	0	2	0	0	0	1	0	0
CT head with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	13	0	3	0	0	0	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	13	0	3	0	0	0	0	0	0
MRI head and internal auditory canal without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	15	0	1	0	0	0	0	0	0

25 (32498757)	4
24 (31977136)	2
23 (30987522)	4
22 (35382682)	2
21 (35042578)	2
20 (34226993)	2
19 (33511482)	4
15 (29738387)	4

CT temporal bone without IV contrast	May be appropriate	Strong	☼☼☼ 1-10 mSv		6	6	0	0	0	1	5	3	5	1	1
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References	Study Quality
25 (32498757)	4
24 (31977136)	2
19 (33511482)	4
23 (30987522)	4
22 (35382682)	2

MRI head without and with IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	1	0	1	3	9	2	0	0	0
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References	Study Quality
27 (23439909)	4
26 (33502545)	2
19 (33511482)	4
15 (29738387)	4
2 (23089314)	4

WBC scan with SPECT or SPECT/CT skull base	May be appropriate	Strong	☼☼☼ 1-10 mSv		5	5	0	0	1	5	8	2	0	0	0
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References	Study Quality
28 (34966623)	4
26 (33502545)	2
24 (31977136)	2
22 (35382682)	2

			19 (33511482)		4													
			18 (21722540)		4													
			17 (26223723)		4													
			15 (29738387)		4													
			2 (23089314)		4													
CT head with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	3	3	6	2	5	1	1	1	0	0	0			
			References		Study Quality													
			18 (21722540)		4													
			17 (26223723)		4													
			16 (24169084)		4													
			15 (29738387)		4													
			4 (28301961)		4													
			2 (23089314)		4													
CT head and neck with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv		3	3	7	0	6	2	1	0	0	0	0			
			References		Study Quality													
			18 (21722540)		4													
			17 (26223723)		4													
			16 (24169084)		4													
			15 (29738387)		4													
			4 (28301961)		4													
			2 (23089314)		4													
MRI head and internal auditory canal without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	3	3	7	0	4	1	2	2	0	0	0			
CT temporal bone without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	13	0	0	0	1	1	1	0	0			
CT head without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	12	0	3	1	0	0	0	0	0			

CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	13	0	1	2	0	0	0	0	0
CT head and neck without IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv		1	1	12	0	2	2	0	0	0	0	0
CT head and neck without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv		1	1	13	0	1	1	1	0	0	0	0
MRI head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	10	1	3	0	2	0	0	0	0
Radiography skull	Usually not appropriate	Limited	☹ <0.1 mSv	☹☹ 0.03-0.3 mSv [ped]	1	1	14	1	1	0	0	0	0	0	0
		References		Study Quality											
		28 (34966623)		4											
MRI head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	1	0	1	1	0	0	0
MRI head and internal auditory canal with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	12	0	1	1	0	0	1	1	0

Variant 3: Adult. Acute otitis media, uncomplicated. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT temporal bone with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv		1	1	13	0	1	2	0	0	0	0	0
CT temporal bone without IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv		1	1	13	0	1	1	0	0	0	0	1
CT temporal bone without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv		1	1	13	0	1	2	0	0	0	0	0

CT head with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	1	1	13	0	1	2	0	0	0	0	0
CT head without IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	1	1	13	0	1	1	0	0	1	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	13	0	1	2	0	0	0	0	0
MRI head and internal auditory canal without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	2	1	0	0	0	0	0
MRI head and internal auditory canal without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	2	0	1	0	0	0	0
MRI head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	2	1	0	0	0	0	0
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	2	1	0	0	0	0	0
Radiography skull	Usually not appropriate	Expert Consensus	⊗ <0.1 mSv	⊗⊗ 0.03-0.3 mSv [ped]	1	1	14	0	1	1	0	0	0	0	0
MRI head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	2	1	0	0	0	0	0
MRI head and internal auditory canal with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	2	1	0	0	0	0	0

Variant 4: Adult. Complicated otitis media. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT temporal bone with IV contrast	Usually appropriate	Strong	⊗⊗⊗ 1-10 mSv		8	8	0	0	0	0	1	0	5	5	5
References				Study Quality											

38 (26607577)	2
32 (23589156)	2
30 (25447953)	4
29 (23852990)	4
9 (28801828)	2

MRI head and internal auditory canal without and with IV contrast	Usually appropriate	Strong	○ ○ mSv	○ ○ mSv [ped]	8	8	0	0	0	0	0	1	6	4	5
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References	Study Quality
38 (26607577)	2
9 (28801828)	2

CTV head with IV contrast	Usually appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	7	7	0	0	0	0	5	1	5	5	0
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References	Study Quality
37 (26590005)	4

CT temporal bone without IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		5	5	0	0	0	3	9	2	2	0	0
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MRV head without IV contrast	May be appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	5	5	3	0	1	4	7	1	0	0	0
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MRV head with IV contrast	May be appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	5	5	0	0	0	3	9	3	1	0	0
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References	Study Quality
37 (26590005)	4

MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	2	2	8	0	1	1	4	1	1	0	0
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CT temporal bone without and with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		1	1	13	1	1	0	0	1	0	0	0
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CT head with IV contrast	Usually not appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	1	1	10	2	3	0	1	0	0	0	0
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References	Study Quality
37 (26590005)	4

36 (21431950)	2
35 (33386931)	4
30 (25447953)	4
9 (28801828)	2
6 (22961223)	2

CT head without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	12	0	0	2	2	0	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	12	1	1	1	0	1	0	0	0
MRI head and internal auditory canal without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	12	3	1	0	0	0	0	0	0
MRI head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	1	2	1	0	1	0	0	0
Radiography skull	Usually not appropriate	Expert Consensus	☼ <0.1 mSv	☼☼ 0.03-0.3 mSv [ped]	1	1	14	0	2	0	0	0	0	0	0
MRV head without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	2	2	1	0	0	0	0	0
CTV head and neck with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	11	0	0	2	1	2	0	0	0
MRI head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	12	0	1	1	0	1	1	0	0
MRI head and internal auditory canal with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	14	1	1	0	0	0	0	0	0
WBC scan with SPECT or SPECT/CT skull base	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	12	0	2	1	0	1	0	0	0

Variant 5: Adult. Chronic otitis media. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
CT temporal bone without IV contrast	Usually appropriate	Strong	⊕⊕⊕ 1-10 mSv		9	9	0	0	0	1	0	1	4	2	8	
		References	Study Quality													
		43 (24818630)	2													
		42 (31155942)	2													
		41 (24582323)	2													
		40 (23764962)	2													
		39 (23521408)	2													
		36 (21431950)	2													
		35 (33386931)	4													
MRI head and internal auditory canal without and with IV contrast	Usually appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	7	7	0	0	0	1	2	0	9	1	3	
		References	Study Quality													
		47 (34557138)	2													
		46 (30920387)	4													
		45 (20927654)	4													
		44 (34509081)	2													
CT temporal bone with IV contrast	Usually not appropriate	Strong	⊕⊕⊕ 1-10 mSv		1	1	10	2	3	0	0	1	0	0	0	
		References	Study Quality													
		39 (23521408)	2													
		36 (21431950)	2													
		35 (33386931)	4													
CT temporal bone without and with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		1	1	15	0	1	0	0	0	0	0	0	
CT head with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	1	1	11	0	3	2	0	0	0	0	0	

CT head without IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	11	1	2	2	0	0	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	12	0	2	2	0	0	0	0	0
MRI head and internal auditory canal without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	10	3	2	0	1	0	0	0	0
MRI head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	10	1	3	1	0	1	0	0	0
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	9	0	3	2	1	1	0	0	0
Radiography skull	Usually not appropriate	Limited	☹ <0.1 mSv	☹☹ 0.03-0.3 mSv [ped]	1	1	14	0	2	0	0	0	0	0	0

References	Study Quality
36 (21431950)	2

MRI head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	1	1	1	1	1	0	0	0
MRI head and internal auditory canal with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	12	0	1	1	1	0	1	0	0

Variant 6: Adult. Postoperative cholesteatoma. Surveillance Imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT temporal bone without IV contrast	Usually appropriate	Limited	☹☹☹ 1-10 mSv		8	8	0	0	0	0	0	0	4	8	4

References	Study Quality
44 (34509081)	2

MRI head and internal auditory canal without and with IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	8	8	1	0	0	0	1	0	5	3	6
		References	Study Quality												
		50 (20360335)	4												
		49 (33461853)	2												
		48 (33926901)	2												
MRI head and internal auditory canal without IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	3	3	6	2	6	0	1	1	0	0	0
		References	Study Quality												
		50 (20360335)	4												
CT temporal bone with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv		1	1	10	0	3	1	0	0	2	0	0
CT temporal bone without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv		1	1	15	0	1	0	0	0	0	0	0
CT head with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	11	1	3	0	1	0	0	0	0
CT head without IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	11	1	4	0	0	0	0	0	0
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	12	0	3	0	1	0	0	0	0
MRI head without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	10	0	3	0	3	0	0	0	0
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	9	1	2	1	1	1	0	0	1
Radiography skull	Usually not appropriate	Expert Consensus	☹ <0.1 mSv	☹☹ 0.03-0.3 mSv [ped]	1	1	14	1	1	0	0	0	0	0	0
MRI head with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	12	0	1	1	1	1	0	0	0

MRI head and internal auditory canal with IV contrast	Usually not appropriate	Expert Consensus	0.0 mSv	0.0 mSv [ped]	1	1	14	1	0	0	0	1	0	0	0
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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.