

American College of Radiology
ACR Appropriateness Criteria®

Headache-Child

Variant 1: Child. Primary headache. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without IV contrast	Usually not appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	3	3	1	1	7	3	3	0	0	0	0
		References		Study Quality											
		12 (24268890)		3											
		11 (22782255)		3											
CT head without IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	2	2	6	2	3	1	1	1	1	0	0
		References		Study Quality											
		28 (23897870)		4											
CTA head with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	13	1	1	0	0	0	0	0	0
CT head with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	9	3	3	0	0	0	0	0	0
		References		Study Quality											
		28 (23897870)		4											
CT head without and with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	1	2	1	0	0	0	0	0
		References		Study Quality											
		28 (23897870)		4											

Arteriography cerebral	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	15	0	0	0	0	0	0	0	0
MRA head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	1	0	2	0	1	0	0	0
MRI head without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	8	3	1	1	1	0	0	1	0

References	Study Quality
12 (24268890)	3
11 (22782255)	3

Radiography skull	Usually not appropriate	Expert Consensus	☹ <0.1 mSv	☹☹ 0.03-0.3 mSv [ped]	1	1	15	0	0	0	0	0	0	0	0
CTV head with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	12	3	0	0	0	0	0	0	0
MRV head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	1	2	1	0	0	0	0	0
MRV head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	2	0	0	0	0	0	0	0

Variant 2: Child. Secondary headache. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without IV contrast	Usually appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	8	8	0	0	0	0	2	1	3	6	3

References	Study Quality
36 (27017020)	4
35 (24766291)	2
17 (24529619)	3
34 (23966248)	4

33 (22766676)	3
38 (21439575)	3
37 (24485928)	3
39 (18765144)	4
30 (2022972)	4
31 (9051039)	3
32 (18160552)	4
24 (21680652)	4

MRI head without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	1	1	3	4	4	2
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References	Study Quality
17 (24529619)	3
34 (23966248)	4
33 (22766676)	3
38 (21439575)	3
37 (24485928)	3
39 (18765144)	4
30 (2022972)	4
31 (9051039)	3
32 (18160552)	4
24 (21680652)	4

CT head without IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	5	5	0	0	0	6	4	3	2	0	0
MRA head without IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	2	0	5	6	1	1	0	0
MRV head without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	2	1	4	7	1	0	0	0

References	Study Quality
43 (22723059)	2
40 (-3101268)	3

		41 (23176141)		3											
		42 (17416816)		4											
CTV head with IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	1	2	2	7	2	1	0	0	0
		References		Study Quality											
		25 (17494676)		3											
CTA head with IV contrast	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	3	3	3	6	0	0	0	0
MRV head with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	3	3	3	3	2	3	4	0	0	0	0
		References		Study Quality											
		43 (22723059)		2											
		40 (-3101268)		3											
		41 (23176141)		3											
		42 (17416816)		4											
Arteriography cerebral	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	3	5	1	3	2	1	0	0	0
CT head with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	2	2	7	2	3	1	1	1	0	0	0
Radiography skull	Usually not appropriate	Expert Consensus	☢ <0.1 mSv	☢☢ 0.03-0.3 mSv [ped]	1	1	13	0	1	0	1	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	9	1	1	3	0	0	1	0	0

[illegible]

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT head without IV contrast	Usually appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	8	8	0	0	0	0	0	0	1	7	7
		References		Study Quality											
		50 (26797666)		M											
MRA head without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	1	1	4	0	5	3	1
		References		Study Quality											
		26 (20541105)		4											
		21 (19164800)		4											
MRI head without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	1	1	3	2	3	3	2
		References		Study Quality											
		39 (18765144)		4											
		45 (17898186)		4											
		44 (18372410)		4											
		48 (20935079)		M											
		46 (21183489)		4											
		47 (20970274)		3											
		49 (11160469)		3											
		21 (19164800)		4											
CTA head with IV contrast	May be appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	5	5	0	0	1	2	5	0	5	2	0
		References		Study Quality											
		44 (18372410)		4											
		48 (20935079)		M											
		21 (19164800)		4											
CT head with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	3	3	6	1	5	1	0	0	2	0	0

		References		Study Quality											
		50 (26797666)		M											
CT head without and with IV contrast	Usually not appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	3	3	5	0	5	1	2	1	1	0	0
		References		Study Quality											
		50 (26797666)		M											
CTV head with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	3	3	3	1	4	5	1	0	1	0	0
MRV head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	3	3	3	2	3	0	1	0	0
MRI head without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	3	3	1	2	5	3	3	1	0	0	0
		References		Study Quality											
		45 (17898186)		4											
		44 (18372410)		4											
		48 (20935079)		M											
		46 (21183489)		4											
		47 (20970274)		3											
		49 (11160469)		3											
		21 (19164800)		4											
Arteriography cerebral	Usually not appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	2	2	4	4	3	2	0	1	1	0	0
		References		Study Quality											
		45 (17898186)		4											
		46 (21183489)		4											
		47 (20970274)		3											
MRV head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	6	2	5	2	0	0	0	0	0

Radiography skull	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	⊕⊕ 0.03-0.3 mSv [ped]	1	1	15	0	0	0	0	0	0	0	0
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Variant 4: Child. Headache attributed to infection. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without and with IV contrast	Usually appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	8	8	0	0	0	1	0	0	2	5	7
		References		Study Quality											
		51 (20709770)		4											
		1 (19564257)		4											
		52 (25846458)		2											
CT head with IV contrast	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	6	6	0	0	1	0	3	8	3	0	0
		References		Study Quality											
		52 (25846458)		2											
CT head without IV contrast	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	5	5	0	1	0	4	9	0	1	0	0
		References		Study Quality											
		52 (25846458)		2											
MRV head without IV contrast	May be appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	5	5	0	2	2	1	8	2	0	0	0
		References		Study Quality											
		53 (20112042)		4											
MRA head without IV contrast	May be appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	4	4	0	1	2	6	6	0	0	0	0
MRI head without IV contrast	May be appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	4	4	0	3	3	4	3	2	0	0	0

		References	Study Quality													
		51 (20709770)	4													
		1 (19564257)	4													
		52 (25846458)	2													
MRV head with IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	4	4	2	3	1	3	5	1	0	0	0	
		References	Study Quality													
		53 (20112042)	4													
CTA head with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	3	3	3	3	3	2	3	1	0	0	0	
CT head without and with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	2	2	6	2	2	2	2	0	1	0	0	
		References	Study Quality													
		52 (25846458)	2													
CTV head with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	2	2	2	6	3	2	1	1	0	0	0	
Arteriography cerebral	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	10	3	2	0	0	0	0	0	0	
Radiography skull	Usually not appropriate	Expert Consensus	☹ <0.1 mSv	☹☹ 0.03-0.3 mSv [ped]	1	1	15	0	0	0	0	0	0	0	0	

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	1	3	1	1	8	1
		References		Study Quality											

		54 (18422678)				4											
CT head without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	3	3	2	4	3	5	0	1	0	0	0		
		References		Study Quality													
		55 (25647678)				3											
CTV head with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	6	1	0	0	1	0	0	0		
CTA head with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	4	5	2	3	1	0	0	0	0		
MRV head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	6	5	2	0	2	0	0	0	0		
MRA head without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	5	4	3	2	0	1	0	0	0		
MRI head without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	2	2	5	4	2	1	1	2	0	0	0		
		References		Study Quality													
		54 (18422678)				4											
MRV head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	7	6	1	1	0	0	0	0	0		
Arteriography cerebral	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	2	0	1	0	0	0	0	0		
CT head with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	8	3	1	0	1	1	1	0	0		
		References		Study Quality													
		55 (25647678)				3											
CT head without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	8	2	1	1	2	1	0	0	0		
		References		Study Quality													

		55 (25647678)			3									
Radiography skull	Usually not appropriate	Expert Consensus	☢ <0.1 mSv	☢☢ 0.03-0.3 mSv [ped]	1	1	12	1	1	1	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.