

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

Seizures-Child

Variant 1: Neonatal seizures, age 0 to 29 days. 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	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	9	9	1	0	0	0	0	1	2	1	12
US transcranial	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	0	6	4	5	3	1
MRI head without and with IV contrast	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	5	5	0	1	0	2	12	2	1	1	0
CT head without IV contrast	May be appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	5	5	0	0	1	2	7	7	2	0	0
CT head with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	2	2	6	4	4	2	0	0	0	0	1
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	14	1	1	0	0	0	0	0	1
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	9	3	2	0	2	0	0	0	1
HMPAO SPECT or SPECT/CT brain	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0

Variant 2: Children 6 months to 5 years of age. Simple febrile seizures. 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	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	7	4	4	1	0	1	0	0	0
US transcranial	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	15	0	1	0	0	0	0	0	1
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	16	0	0	0	0	0	0	0	1
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	4	1	0	0	0	0	0	1
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	14	2	0	0	0	0	0	0	1
CT head without IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	1	1	11	4	1	0	0	0	0	0	1
CT head with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	1	1	13	3	0	0	0	0	0	0	1
HMPAO SPECT or SPECT/CT brain	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0

Variant 3: Children 6 months to 5 years of age. Complex febrile seizures. 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	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	0	5	9	4	0	0	1
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	2	5	6	5	1	0	0	0	0

CT head without IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	3	3	6	2	8	2	0	0	1	0	0
US transcranial	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	14	1	1	0	0	0	0	0	1
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	16	0	0	0	0	0	0	0	1
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	10	4	2	0	0	0	0	0	1
CT head with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	1	1	12	0	3	0	1	0	0	0	1
HMPAO SPECT or SPECT/CT brain	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0

Variant 4: Children 1 month to 17 years of age. Post-traumatic seizures, not including abusive head trauma. Initial imaging.

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	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	9	9	0	0	0	1	0	1	4	2	9
MRI head without IV contrast	Usually appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	7	7	0	0	0	0	5	2	5	2	3
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	5	5	8	0	0	1	0	0	0
US transcranial	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	2	1	0	0	0	0	0	1
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	15	1	0	0	0	0	0	0	1

CT head without and with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	11	2	0	1	2	0	0	0	1
CT head with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	1	1	10	4	1	1	0	0	0	0	1
HMPAO SPECT or SPECT/CT brain	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0

Variant 5: Children 1 month to 17 years of age. Focal seizures, not including abusive head trauma. 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	Limited	○ 0 mSv	○ 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0

References	Study Quality
53 (24970739)	4
58 (24449193)	2
35 (11859865)	4
60 (19027586)	4
61 (20089940)	4

MRI head without and with IV contrast	May be appropriate (Disagreement)	Expert Opinion	○ 0 mSv	○ 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
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References	Study Quality
53 (24970739)	4
58 (24449193)	2
35 (11859865)	4
60 (19027586)	4
61 (20089940)	4

CT head without IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
CT head with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	2	n/a	0	0	0	0	0	0	0	0	0
US transcranial	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	n/a	0	0	0	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	n/a	0	0	0	0	0	0	0	0	0
HMPAO SPECT or SPECT/CT brain	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0

Variant 6: Children 1 month to 17 years of age. Primary generalized seizure (neurologically normal). 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	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	5	5	1	0	0	3	13	1	0	0	1
MRI head without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	7	2	6	3	1	0	0	0	0
CT head without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	2	2	8	2	7	1	1	0	0	0	0
US transcranial	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	15	0	1	0	0	0	0	0	1
FDG-PET/CT brain	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	14	2	0	0	0	0	0	0	1

Variant 8: Children 1 month to 17 years of age. Intractable seizures or refractory epilepsy.

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	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	9	9	1	0	0	0	0	0	0	0	0	16
FDG-PET/CT brain	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	6	6	1	0	0	0	5	12	1	0	0	
HMPAO SPECT or SPECT/CT brain	May be appropriate	Strong	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0	
			References	Study Quality												
			76 (27818371)	2												
			64 (26021550)	2												
			79 (25308754)	2												
			71 (24799620)	3												
			78 (23293926)	2												
			77 (23030361)	3												
			69 (21275980)	2												
			55 (11258411)	3												
MRI head without and with IV contrast	May be appropriate (Disagreement)	Expert Opinion	○ 0 mSv	○ 0 mSv [ped]	5	5	0	0	2	1	2	11	1	2	0	
CT head without IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	3	3	6	2	5	3	2	0	1	0	0	
US transcranial	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	16	0	0	0	0	0	0	0	1	
CT head without and with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	9	2	1	2	1	1	0	0	1	

CT head with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	10	1	2	1	1	1	0	0	1
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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.