



MRA head without IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	8	8	2	0	0	0	0	2	3	6	5
		References	Study Quality												
		17 (20113901)	4												
		26 (15703900)	4												
		27 (21220720)	3												
CTA head with IV contrast	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	6	6	1	0	0	0	7	10	0	0	0
		References	Study Quality												
		17 (20113901)	4												
MRI head perfusion with IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	2	0	1	0	7	7	1	0	0
		References	Study Quality												
		17 (20113901)	4												
		19 (20625171)	4												
		29 (17066483)	3												
MRI head perfusion without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	0	1	0	2	13	3	0	1	0
		References	Study Quality												
		17 (20113901)	4												
		19 (20625171)	4												
		29 (17066483)	3												
MRI head without and with IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	4	4	1	0	0	9	5	2	1	0	0
		References	Study Quality												
		6 (20054007)	4												
		16 (20445969)	4												
		17 (20113901)	4												
		18 (19216043)	4												
		19 (20625171)	4												









CT head with IV contrast	Usually not appropriate	Limited	⊗⊗⊗ 1-10 mSv	⊗⊗⊗ 0.3-3 mSv [ped]	1	1	11	3	2	0	1	1	0	0	1
		References	Study Quality												
		16 (20445969)	4												
CT head without and with IV contrast	Usually not appropriate	Limited	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	13	4	1	0	0	0	0	0	0
		References	Study Quality												
		16 (20445969)	4												
CT head perfusion with IV contrast	Usually not appropriate	Limited	⊗⊗⊗ 1-10 mSv	Varies	1	1	12	5	0	1	0	0	0	0	0
		References	Study Quality												
		28 (22209434)	4												
Arteriography cervicocerebral	Usually not appropriate	Limited	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	13	3	2	0	0	0	0	1	0
		References	Study Quality												
		30 (24483252)	4												
		31 (9799310)	4												
US duplex Doppler head	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	10	7	1	0	0	0	0	0	0
		References	Study Quality												
		34 (15846018)	3												
		35 (15703903)	4												

**Variant 3: Child. Clinical presentation suggestive of acute stroke, known or suspected arteriopathy, or moyamoya. Not a candidate for emergent treatment. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRA head without IV contrast	Usually appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	9	9	1	0	0	0	0	3	1	3	10

MRI head without IV contrast	Usually appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	9	9	1	0	0	0	0	0	2	1	15
		References		Study Quality											
		15 (29364767)		1											
		44 (24558166)		M											
		45 (15703904)		4											
CTA head with IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	6	6	1	0	0	1	6	8	2	0	0
CT head without IV contrast	May be appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	6	6	0	0	0	0	6	9	2	0	1
		References		Study Quality											
		43 (9885601)		2											
MRI head without and with IV contrast	May be appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	5	5	1	0	0	4	8	3	2	0	0
		References		Study Quality											
		15 (29364767)		1											
		44 (24558166)		M											
		45 (15703904)		4											
MRI head perfusion with IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	1	0	0	2	8	5	1	1	0
		References		Study Quality											
		39 (22462697)		4											
		46 (24335546)		2											
		47 (29581340)		3											
		48 (24335813)		4											
		49 (24055185)		3											
MRI head perfusion without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	1	1	0	2	11	4	0	1	0
		References		Study Quality											
		39 (22462697)		4											



			46 (24335546)		2												
			47 (29581340)		3												
			48 (24335813)		4												
			49 (24055185)		3												
CT head perfusion with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	Varies	3	3	7	1	3	1	5	1	0	1	0		
		References	Study Quality														
		28 (22209434)	4														
MRA head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	7	1	6	3	0	1	0	0	0		
MRI head with IV contrast	Usually not appropriate	Moderate	○ 0 mSv	○ 0 mSv [ped]	2	2	8	2	5	3	0	0	0	0	0		
		References	Study Quality														
		15 (29364767)	1														
		44 (24558166)	M														
		45 (15703904)	4														
US duplex Doppler head	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	9	3	3	0	2	2	0	0	0		
CT head with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	10	5	2	1	0	0	0	0	0		
		References	Study Quality														
		43 (9885601)	2														
CT head without and with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	5	1	1	0	0	0	0	0		
		References	Study Quality														
		43 (9885601)	2														
Arteriography cervicocerebral	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	3	3	0	0	1	0	0	0		

HMPAO SPECT or SPECT/CT brain	Usually not appropriate		☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	1	5	0	1	0	0	0	0
			References	Study Quality											
			39 (22462697)	4											

**Variant 4: Child. Known or suspected cervicocranial arterial dissection based on clinical or imaging findings. Next imaging study.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI head and neck without IV contrast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	1	1	6	10
			References	Study Quality											
			50 (25987283)	4											
			52 (21979145)	4											
			53 (19351813)	3											
CTA head and neck with IV contrast	Usually appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	8	8	0	0	1	0	0	3	1	9	5
			References	Study Quality											
			50 (25987283)	4											
			52 (21979145)	4											
MRA head and neck without IV contrast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	8	8	1	1	0	0	0	1	1	8	7
			References	Study Quality											
			52 (21979145)	4											
			53 (19351813)	3											
CT head without IV contrast	May be appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	6	6	1	0	0	2	3	12	0	0	0
			References	Study Quality											
			43 (9885601)	2											





MRA head with IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	6	6	1	0	0	0	6	10	1	0	0
		References	Study Quality												
		17 (20113901)	4												
Arteriography cervicocerebral	May be appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	1	0	0	2	7	6	2	0	0
		References	Study Quality												
		17 (20113901)	4												
MRI head with IV contrast	May be appropriate (Disagreement)	Expert Opinion	○ 0 mSv	○ 0 mSv [ped]	5	5	3	0	2	3	6	3	1	0	0
CT head with IV contrast	Usually not appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	2	2	6	5	6	0	0	1	0	0	1
		References	Study Quality												
		56 (15986347)	4												
CT head without and with IV contrast	Usually not appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	2	2	8	5	4	1	0	0	0	1	0
		References	Study Quality												
		56 (15986347)	4												
US duplex Doppler head	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	12	2	2	0	2	0	0	1	0

**Variant 6: Child. Nontraumatic intraparenchymal hemorrhage (hematoma) found on CT or MRI. Unknown etiology. Next imaging study.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRA head without IV contrast	Usually appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	9	9	0	2	0	0	0	1	1	4	11

CTA head with IV contrast	Usually appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	8	8	0	1	0	0	0	2	6	3	7
Arteriography cervicocerebral	Usually appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	7	7	1	0	0	0	0	2	10	2	3
			References	Study Quality											
			60 (22816607)	4											
			61 (26795616)	4											
MRI head without and with IV contrast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	7	7	0	0	0	0	1	1	9	4	3
			References	Study Quality											
			24 (25063989)	3											
MRA head with IV contrast	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	0	5	7	5	1	0
MRI head without IV contrast	May be appropriate (Disagreement)	Expert Opinion	○ 0 mSv	○ 0 mSv [ped]	5	5	1	0	1	2	6	3	5	0	0
			References	Study Quality											
			24 (25063989)	3											
MRI head with IV contrast	May be appropriate (Disagreement)	Expert Opinion	○ 0 mSv	○ 0 mSv [ped]	5	5	2	0	0	2	6	5	2	1	0
			References	Study Quality											
			24 (25063989)	3											
CT head with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	3	3	7	2	7	1	1	0	0	0	0
			References	Study Quality											
			59 (24156863)	4											
CT head without IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	2	2	7	4	5	0	1	0	1	1	0
			References	Study Quality											



MRA head with IV contrast	May be appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	0	4	9	3	2	0
		References	Study Quality												
		51 (24156864)	4												
		67 (24326447)	Good												
		68 (9933265)	M												
MRI head without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	1	0	0	1	11	5	0	0	0
		References	Study Quality												
		60 (22816607)	4												
		63 (19357386)	4												
MRI head without and with IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	0	0	0	1	11	5	0	0	1
		References	Study Quality												
		60 (22816607)	4												
		63 (19357386)	4												
MRI head with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	3	3	8	1	5	3	1	0	0	0	0
		References	Study Quality												
		60 (22816607)	4												
		63 (19357386)	4												
CT head with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	2	2	6	4	6	1	0	1	1	0	0
		References	Study Quality												
		59 (24156863)	4												
CT head without IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	2	2	9	3	5	1	0	0	0	0	0
		References	Study Quality												
		59 (24156863)	4												



CT head without and with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	2	2	8	2	6	2	0	1	0	0	0
		References		Study Quality											
		59 (24156863)		4											
US duplex Doppler head	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	11	3	2	1	1	0	0	0	1

**Variant 8: Child. Clinical presentation suggestive of acute stroke, known or suspected high-flow vascular anomaly. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CTA head with IV contrast	Usually appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	8	8	1	0	0	0	0	1	3	7	7
CT head without IV contrast	Usually appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	8	8	0	0	0	0	0	2	6	3	7
		References		Study Quality											
		59 (24156863)		4											
MRA head without IV contrast	Usually appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	8	8	0	1	0	0	0	1	1	7	9
MRI head without IV contrast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	8	8	0	0	0	0	1	1	3	5	8
		References		Study Quality											
		24 (25063989)		3											
MRI head without and with IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	0	4	11	1	1	1
		References		Study Quality											
		24 (25063989)		3											
MRA head with IV contrast	May be appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	4	1	5	8	0	0

Arteriography cervicocerebral	May be appropriate (Disagreement)	Expert Opinion	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	5	3	5	4	4	2	0	0	0	3	0
		References		Study Quality											
		59 (24156863)		4											
		71 (24286156)		2											
MRI head with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	3	3	5	3	5	2	3	0	0	0	0
		References		Study Quality											
		24 (25063989)		3											
CT head with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	2	2	6	6	6	0	0	0	0	0	0
		References		Study Quality											
		59 (24156863)		4											
CT head without and with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	2	2	8	9	1	0	0	0	0	0	0
		References		Study Quality											
		59 (24156863)		4											
US duplex Doppler head	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	9	2	4	1	1	0	1	0	1

**Variant 9: Child. Clinical presentation suggestive of acute stroke, known or suspected low-flow vascular anomaly. 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	9	0	0	0	0	1	0	3	4	10
		References		Study Quality											
		75 (26272978)		4											

CT head without IV contrast	Usually appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	7	7	2	0	0	0	3	3	5	4	3
		References		Study Quality											
		61 (26795616)		4											
MRI head without and with IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	2	3	6	5	1	1
		References		Study Quality											
		75 (26272978)		4											
CTA head with IV contrast	May be appropriate (Disagreement)	Expert Opinion	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	5	3	6	2	5	1	1	3	0	0	0
MRA head without IV contrast	May be appropriate (Disagreement)	Expert Opinion	○ 0 mSv	○ 0 mSv [ped]	5	3	5	2	6	0	1	0	2	0	2
CT head without and with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	3	3	7	3	4	0	4	0	0	1	1
		References		Study Quality											
		61 (26795616)		4											
MRA head with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	6	2	5	1	3	1	0	0	0
CT head with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	2	2	9	4	4	1	0	0	0	0	0
		References		Study Quality											
		61 (26795616)		4											
MRI head with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	2	2	7	4	2	3	1	0	1	0	0
		References		Study Quality											
		75 (26272978)		4											
Arteriography cervicocerebral	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	2	4	1	0	0	0	0	0

		References	Study Quality												
		61 (26795616)	4												
US duplex Doppler head	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	13	2	4	0	0	0	0	0	1

**Variant 10: Child. Clinical presentation suggestive of acute stroke, known or suspected cortical vein or dural venous sinus thrombosis. Initial imaging.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRV head with IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	9	9	1	0	0	0	0	1	3	3	11
		References	Study Quality												
		80 (22948810)	4												
MRI head without and with IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	8	8	1	1	0	0	1	1	3	5	7
		References	Study Quality												
		77 (23212594)	4												
		80 (22948810)	4												
		81 (25938564)	2												
MRV head without IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	8	8	0	0	0	0	0	2	7	3	7
		References	Study Quality												
		80 (22948810)	4												
CTV head with IV contrast	Usually appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	8	8	0	1	0	0	1	2	2	5	8
CT head without IV contrast	Usually appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕ 0.3-3 mSv [ped]	7	7	0	0	0	0	0	5	5	3	5
		References	Study Quality												
		77 (23212594)	4												

			79 (20437556)		1													
			80 (22948810)		4													
MRI head without IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	1	0	1	4	3	7	0	3			
			References		Study Quality													
			77 (23212594)		4													
			80 (22948810)		4													
			81 (25938564)		2													
CT head with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	3	3	6	1	5	1	4	0	1	0	0			
			References		Study Quality													
			77 (23212594)		4													
			79 (20437556)		1													
			80 (22948810)		4													
CT head without and with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	8	4	2	2	1	0	1	0	0			
			References		Study Quality													
			77 (23212594)		4													
			79 (20437556)		1													
			80 (22948810)		4													
Arteriography cervicocerebral	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	8	4	3	1	1	0	0	2	0			
MRI head with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	2	2	7	3	3	0	3	2	0	0	0			
			References		Study Quality													
			77 (23212594)		4													
			80 (22948810)		4													
			81 (25938564)		2													
US duplex Doppler head	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	10	6	2	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](http://www.acr.org/ac).