American College of Radiology ACR Appropriateness Criteria®

Cervical Pain or Cervical Radiculopathy

Variant 1: Adult. Acute or increasing cervical pain without radiculopathy. No trauma or "red flags." Initial imaging.

	Appropri	iateness	207							F	inal '	Tabu	latio	ns		
Procedure	Categ	gory	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography cervical spine	May approp		Limited	�� 0.1-1mS	≎≎ 0.03- 0.3 mSv [ped]	5	5	0	0	0	3	8	7	0	0	0
			References		Stud	y Quality										
			48 (24968795)			4										
			49 (9224245)			4										
CTA neck with IV contrast	Usuall approp		Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	16	0	0	1	0	0	0	0	1
CT myelography cervical spine	Usuall approp		Expert Consensus	���� 10-3 mSv	0	1	1	16	0	0	1	0	0	0	0	1
CT cervical spine with IV contrast	Usuall approp		Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	15	1	0	0	1	0	0	1	0
			References		Stud	y Quality										
			42 (17379279)		Ina	dequate										
			43 (20006557)			1										
			44 (35699680)			2										
			45 (28753389)			2										
CT cervical spine without IV contrast	Usuall approp		Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	14	3	1	0	0	0	0	0	0
			References		Stud	y Quality										

		42 (17379279)		Ina	dequate										
		43 (20006557)			1										
		44 (35699680)			2										
		45 (28753389)			2										
CT cervical spine without and with IV contrast	Usually approp	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	16	0	0	0	1	0	0	0	1
Discography cervical spine	Usually approp	Expert Consensus	�� 0.1-1mS	v	1	1	16	0	0	1	0	0	0	1	0
Radiographic myelography cervical spine	Usually approp	Expert Consensus	≎≎≎ 1-10 mSv		1	1	16	0	0	0	0	1	0	0	1
MRA neck without IV contrast	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRA neck without and with IV contrast	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRI cervical spine without IV contrast	Usually approp	Limited	O 0 mSv	O 0 mSv [ped]	1	1	14	2	2	0	0	0	0	0	0
		References		Stud	y Quality										
		1 (25659245)			4										
		47 (17088193)			3										
		46 (9460946)			2										
MRI cervical spine without and with IV contrast	Usually approp	Limited	O 0 mSv	O 0 mSv [ped]	1	1	14	1	1	0	1	0	0	0	1
		References		Stud	y Quality		-								
		1 (25659245)			4										
		47 (17088193)			3										
		46 (9460946)			2										
Radiography cervical spine flexion extension lateral views	Usually approp	Limited	�� 0.1-1mS	v	1	1	13	2	3	0	0	0	0	0	0
		References			y Quality										
		48 (24968795)			4										

			49 (9224245)				4										
MRA neck with IV contrast	Usuall approp		Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRI cervical spine with IV contrast	Usuall approp	-	Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	16	0	0	1	0	0	0	0	1
Bone scan whole body with SPECT or SPECT/CT cervical spine	Usuall approp	y not oriate	Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	16	1	0	0	0	0	1	0	0
			References			Study	Quality										
			41 (34698290)				4										

Variant 2: Adult. Acute or increasing cervical pain with radiculopathy. No trauma or "red flags." Initial imaging.

ъ .	Appropri	iateness	COL	4 1 14 DD	_ [D I DDI	- ·	3.6.31			F	inal '	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RR	L	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI cervical spine without IV contrast	May approp	be oriate	Strong	O 0 mSv		O 0 mSv [ped]	6	6	0	0	0	2	7	5	3	0	1
			References			Study	Quality										
			1 (25659245)				4										
			69 (19525791)				3										
			47 (17088193)				3										
			55 (21047885)				2										
			46 (9460946)				2										
			68 (2847516)				4										
			67 (33025192)				2										
			70 (35434382)				2										
Radiography cervical spine	May approp	be oriate	Strong	�� 0.1-1m	Sv	�� 0.03- 0.3 mSv [ped]	5	5	0	0	0	3	10	3	2	0	0
			References			Study	Quality		_								
			67 (33025192)				2										

			71 (35276718)			2										
CTA neck with IV contrast	Usually rappropria		Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
CT myelography cervical spine	Usually n	not ate	Limited	���� 10-3 mSv	0	1	1	12	0	2	2	0	1	1	0	0
			References		Study	y Quality										
			64 (21616277)			4										
			65 (27432666)			4										
			66 (32058837)			4										
CT cervical spine with IV contrast	Usually nappropria		Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	16	0	0	0	1	0	1	0	0
			References		Study	y Quality										
			42 (17379279)		Ina	dequate										
			62 (16632616)			2										
			43 (20006557)			1										
			44 (35699680)			2										
			45 (28753389)			2										
			63 (26175589)			2										_
CT cervical spine without IV contrast	Usually n		Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	11	1	1	4	1	0	0	0	0
			References		Study	y Quality										
			42 (17379279)		Ina	dequate										
			62 (16632616)			2										
			43 (20006557)			1										
			44 (35699680)			2										
			45 (28753389)			2										
			63 (26175589)			2				,		1				
CT cervical spine without and with IV contrast	Usually nappropria		Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	15	1	0	0	1	0	0	0	1

Radiographic myelography cervical spine	Usually appropris	not ate	Expert Consensus	��� 1-10 mSv		1	1	13	1	1	0	1	1	0	0	1
MRA neck without IV contrast	Usually appropris		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRA neck without and with IV contrast	Usually appropri		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRI cervical spine without and with IV contrast	Usually appropri		Strong	O 0 mSv	O 0 mSv [ped]	1	1	14	1	0	0	1	0	2	0	0
			References		Stud	y Quality										
			1 (25659245)			4										
			69 (19525791)			3										
			47 (17088193)			3										
			55 (21047885)			2										
			46 (9460946)			2										
			68 (2847516)			4										
			67 (33025192)		2											
			70 (35434382)			2										
Radiography cervical spine flexion extension lateral views	Usually appropri		Strong	�� 0.1-1mS	Sv	1	1	11	4	1	0	1	1	0	0	0
			References		Stud	y Quality										
			67 (33025192)			2										
			71 (35276718)			2										
MRA neck with IV contrast	Usually appropri		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRI cervical spine with IV contrast	Usually appropris		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	0	0	0	1	0	0	1
Bone scan whole body with SPECT or SPECT/CT cervical spine	Usually appropri		Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	16	0	1	0	0	0	0	1	0
			References		Stud	y Quality										
			41 (34698290)		4											

Variant 3: Adult. Prior cervical spine surgery. Acute or increasing mechanical cervical pain or radiculopathy. No trauma or "red flags." Initial imaging.

D 1	Appropriateness	COF	A L LA DEST	D I DD	D 41	N. 1.			F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT cervical spine without IV contrast	Usually appropriate	Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	7	7	0	0	0	0	2	2	7	4	3
		References		Study	Quality										
		86 (23479714)			4										
		85 (23118135)			4										
		82 (18469691)			2										
		84 (16889148)			2										
		83 (26430596)			3										
		72 (27417403)			4										
		28 (30667316)			2										
		30 (31039024)			4										
		29 (31944834)			4										
		27 (33963025)			4										
		87 (12734742)			2			1		_					
MRI cervical spine without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	1	0	0	1	0	5	5	2	4
		References		Study	Quality										
		1 (25659245)			4										
		89 (24183750)			4										
		46 (9460946)			2										
		79 (34113681)			4										
Radiography cervical spine	Usually appropriate	Limited	�� 0.1-1mSv	�� 0.03- v 0.3 mSv [ped]	7	7	0	0	0	0	0	1	10	2	5
		References		Study	Quality										
		85 (23118135)			4										

		92 (32405554)			4										
		73 (35701631)			4										
		79 (34113681)			4										
Radiography cervical spine flexion extension lateral views	Usually appropriate	Limited	�� 0.1-1mSv		7	7	0	0	0	0	3	0	9	4	2
		References		Study	Quality										
		85 (23118135)			4										
		92 (32405554)			4										
		73 (35701631)			4										
		79 (34113681)			4										
CT myelography cervical spine	May be appropriate	Limited	❤❤❤❤ 10-30 mSv	��� 0.3- 3 mSv [ped]	5	5	1	0	1	2	12	1	0	0	1
		References		Study	Quality										
		64 (21616277)			4										
		65 (27432666)			4										
		66 (32058837)			4										
MRI cervical spine without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	5	9	3	1	0	0
		References		Study	/ Quality										
		1 (25659245)			4										
		89 (24183750)			4										
		46 (9460946)			2										
		91 (2119123)			4										
		90 (11371319)			4										
		79 (34113681)			4										
CTA neck with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	15	1	1	0	0	0	0	0	1
CT cervical spine with IV contrast	Usually not appropriate	Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	10	2	1	2	1	1	1	0	0
		References		Study	Quality										

86 (23479714)	4
85 (23118135)	4
82 (18469691)	2
84 (16889148)	2
83 (26430596)	3
72 (27417403)	4
88 (22643393)	4
28 (30667316)	2
30 (31039024)	4
29 (31944834)	4
27 (33963025)	4
87 (12734742)	2

		07 (12731712)													
CT cervical spine without and with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	17	0	0	1	0	0	0	0	0
Discography cervical spine	Usually not appropriate	Expert Consensus	�� 0.1-1mSv		1	1	16	0	1	0	0	0	0	1	0
Radiographic myelography cervical spine	Usually not appropriate	Expert Consensus	��� 1-10 mSv		1	1	12	2	1	2	0	0	0	0	1
MRA neck without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	1	1	0	0	0	0	0	1
MRA neck without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRA neck with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRI cervical spine with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	1	1	0	0	0	0	0	0
Bone scan whole body with SPECT or SPECT/CT cervical spine	Usually not appropriate	Strong	ଡ େଡ 1-10 mSv	���� 3- 10 mSv [ped]	1	1	14	1	0	1	1	0	1	0	0

References	Study Quality
78 (11037993)	1

41 (34698290)	4
79 (34113681)	4
80 (26266888)	4
81 (28681193)	2

Variant 4: Adult. Suspected or known infection with acute or increasing cervical pain or radiculopathy. No trauma. Initial imaging.

- ·	Appropriateness	COF	4.1.1. DDI	D 1 DD1	D .:	37.11			I	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI cervical spine without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	1	5	0	12
		References		Study	Quality										
		106 (12802004))		2										
		108 (15776239))		3										
		109 (12594568))		4										
		111 (25637321))		4										
		110 (24999081))		4										
		112 (24742801))		1										
		93 (15081128)			4										
		100 (20876624))		4										
MRI cervical spine without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	1	0	1	0	4	7	4	0	1
		References		Study	Quality										
		106 (12802004))		2										
		108 (15776239))		3										
		111 (25637321))		4										
		112 (24742801))		1										
		93 (15081128)			4										
		100 (20876624))		4										

CT cervical spine with IV contrast	May be appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	0	0	0	4	10	3	1	0	0
		References		Stud	y Quality					•	•	•			•
		94 (25296275))		4										
		103 (22677300))		4										
		97 (30527522)	<i>'</i>		4										
CT cervical spine without IV contrast	May be appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	0	0	0	4	13	1	0	0	0
		References		Stud	y Quality						•	•	•		•
		94 (25296275))		4										
		103 (22677300))		4										
Radiography cervical spine flexion extension lateral views	Usually not appropriate	Limited	�� 0.1-1mSv	,	3	3	8	1	2	1	4	1	1	0	0
		References		Stud	y Quality						•		•		
		94 (25296275))		4										
		113 (11316355	5)		4										
		103 (22677300))		4										
		99 (23122265))		4										
		100 (20876624	4)		4										
Gallium scan whole body	Usually not appropriate	Strong	���� 10-30 mSv		2	2	9	0	4	0	3	1	1	0	0
		References		Stud	y Quality						•				
		102 (25475377	')		4										
		106 (12802004	.)		2										
		101 (22889769			2										
		107 (1919723))		2										
CTA neck with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	15	1	1	0	0	0	0	0	1

CT myelography cervical spine	Usually approp	Limited	ଡଡଡଡ 10-3 mSv	30	��� 0.3- 3 mSv [ped]	1	1	10	1	2	1	3	0	1	0	0
		References			Study	y Quality		-								
		64 (21616277)				4										
		65 (27432666)				4										
		66 (32058837)				4										
CT cervical spine without and with IV contrast	Usually approp	Expert Consensus	��� 1-10 mSv	0	���� 3- 10 mSv [ped]	1	1	12	0	1	1	3	0	0	0	1
Discography cervical spine	Usually approp	Expert Consensus	�� 0.1-1m	ıSv		1	1	16	0	0	0	0	1	0	0	1
Radiographic myelography cervical spine	Usually approp	Expert Consensus	��� 1-10 mSv	0		1	1	14	0	1	1	1	0	0	0	1
MRA neck without IV contrast	Usually approp	Expert Consensus O 0 mSv		O 0 mSv [ped]	1	1	15	1	1	0	0	0	0	0	1	
MRA neck without and with IV contrast	Usually approp	Consensus		O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1	
WBC scan whole body	Usually approp	Limited	≎≎≎≎ 10∹ mSv	30	���� 3- 10 mSv [ped]	1	1	13	3	2	0	0	0	0	0	0
		References			Study	y Quality										
		115 (29256136))			2										
		114 (19182734))			4										
FDG-PET/CT skull base to mid-thigh	Usually approp	Limited	���� 10∹ mSv	30	���� 3- 10 mSv [ped]	1	1	17	1	0	0	0	0	0	0	0
		References			Study	y Quality										
		102 (25475377)				4										
		104 (11914890)				4										
		100 (20876624)				4										
		105 (18525363)			4											

Radiography cervical spine	Usuall approp		Limited	�� 0.1-1n	ıSv	�� 0.03- 0.3 mSv [ped]	1	1	10	3	0	1	3	1	0	0	0
	•		References			Study	Quality										
			94 (25296275)				4										
			113 (11316355))			4										
			103 (22677300))			4										
			99 (23122265)				4										
			100 (20876624))			4										
MRA neck with IV contrast	Usuall _i		Expert Consensus	O 0 mSv	/	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRI cervical spine with IV contrast	Usuall: approp	y not riate	Expert Consensus	O 0 mSv	/	O 0 mSv [ped]	1	1	17	0	0	1	0	0	0	0	0
Bone scan whole body with SPECT or SPECT/CT cervical spine	Usuall approp		Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	12	0	2	0	2	0	1	0	1
			References			Study	Quality										
			102 (25475377))			4										
			100 (20876624)				4										
			101 (22889769))			2										

Variant 5: Adult. Diagnosis of malignancy with acute or increasing cervical pain or radiculopathy. No trauma. Initial imaging.

D 1	Appropriateness	COE	A L LA DDI	D I DDI	D 4	3.6.11			F	inal '	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI cervical spine without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	1	2	2	2	11

References	Study Quality
1 (25659245)	4
133 (25412631)	4
46 (9460946)	2

136 (26339464)																
126 (22487970)			136 (26339464))		4										
123 (23470032)			119 (28507888))	Ina	dequate										
MRI cervical spine without IV contrast May be appropriate			126 (22487970))		4										
CT cervical spine with IV contrast Appropriate Limited Appropriate Limited Appropriate Limited Appropriate Limited Appropriate Limited Appropriate Appropriate			123 (23470032))		4										
1 (25659245)			Limited	O 0 mSv		6	6	1	0	0	0	4	5	5	1	2
133 (25412631)			References		Study	y Quality										
46 (9460946) 2 136 (26339464) 4 4 126 (22487970) 4			1 (25659245)			4										
136 (26339464)			133 (25412631))		4										
126 (22487970)			46 (9460946)			2										
123 (23470032)			136 (26339464))		4										
CT cervical spine with IV contrast			126 (22487970))		4										
CT cervical spine without IV contrast May be appropriate Limited May be appropriate Limited May be appropriate May be app			123 (23470032))		4										
125 (18191356) 3 126 (22487970) 4 123 (23470032) 4 127 (-3197175) 4	CT cervical spine with IV contrast		Limited		10 mSv	5	5	2	0	2	3	9	2	0	0	0
126 (22487970)			References		Study	y Quality										
123 (23470032) 4			125 (18191356))		3										
CT cervical spine without IV contrast May be appropriate Limited Msv 10 mSv 5 5 0 0 0 2 13 2 1 0 0			126 (22487970))		4										
CT cervical spine without IV			123 (23470032))		4										
Contrast Contrast			127 (-3197175)			4										
125 (18191356) 3 126 (22487970) 4		May be appropriate	Limited		10 mSv	5	5	0	0	0	2	13	2	1	0	0
126 (22487970)			References		Study	y Quality										
TDG-PET/CT whole body			125 (18191356))		3										
FDG-PET/CT whole body May be appropriate Moderate Moderate Moderate Moderate Study Quality FDG-PET/CT whole body Study Quality			126 (22487970))		4										
May be appropriate Moderate			123 (23470032))		4										
	FDG-PET/CT whole body		Moderate		10 mSv	5	5	7	0	0	1	8	0	1	1	0
129 (21887484) Good			References		Study	y Quality										
			129 (21887484))	(Good										

		126 (22487970)			4										
		128 (25475379)			4										
		130 (28250855))		4					1	ı				
CTA neck with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	14	0	1	0	1	1	0	0	1
CT myelography cervical spine	Usually not appropriate	Limited	���� 10-30 mSv	0	1	1	11	0	0	2	4	0	0	0	1
		References		Stud	y Quality										
		64 (21616277)			4										
		65 (27432666)			4										
		66 (32058837)			4										
CT cervical spine without and with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	12	1	1	0	2	0	1	0	1
Discography cervical spine	Usually not appropriate	Expert Consensus	�� 0.1-1mS	Sv	1	1	16	0	0	0	0	1	0	0	1
Radiographic myelography cervical spine	Usually not appropriate	Expert Consensus	��� 1-10 mSv		1	1	14	1	0	1	1	0	0	0	1
MRA neck without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	0	1	1	0	1	0	0	1
MRA neck without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	0	1	1	1	0	0	0	1
Radiography cervical spine	Usually not appropriate	Limited	�� 0.1-1mS	& 0.03- 0.3 mSv [ped]	1	1	10	2	2	2	1	0	0	1	0
		References		Stud	y Quality										
		136 (26339464))		4										
		137 (22487972))		4										
		123 (23470032))		4										
Radiography cervical spine flexion extension lateral views	Usually not appropriate	Limited	�� 0.1-1mS	Sv	1	1	16	2	0	0	0	0	0	0	0

References Study Quality 136 (26339464) 4 137 (22487972) 4 123 (23470032) 5 123 (23470032) 5 123 (23470032) 5 123 (23470032) 5 123 (23470032) 5 123 (23470032) 6 123 (23470032) 7
137 (22487972) 4 123 (23470032) 4
MRA neck with IV contrast Usually not appropriate Expert Consensus O 0 mSv
MRA neck with IV contrast Usually not appropriate Expert Consensus O 0 mSv [ped] 1
MRI cervical spine with IV contrast Usually not appropriate Expert Consensus O 0 mSv [ped] 1
contrast appropriate Consensus O 0 mSv [ped] 1 1 1 1 0 0 0 0 0 FDG-PET/MRI skull base to mid- Strong O mSv [ped] 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
References Study Quality
133 (25412631) 4
132 (24907940) 1
131 (27540427) 2
Fluoride PET/CT whole body Usually not appropriate Strong S
References Study Quality
135 (19504092)
134 (28872551) 2
128 (25475379) 4
Bone scan whole body with SPECT or SPECT/CT cervical appropriate Limited body with SPECT or SPECT/CT cervical appropriate appropriate appropriate appropriate appropriate appropriate appropr
References Study Quality
123 (23470032) 4
122 (22505821) 4
124 (35502272) 4
FDG-PET/MRI whole body Usually not appropriate Strong Stron
References Study Quality
133 (25412631) 4

132 (24907940)	1
131 (27540427)	2

Variant 6: Adult. Suspected cervicogenic headache. No neurologic deficit. Initial imaging.

	Appropria	iteness	207								F	inal	Tabu	ılatio	ns		
Procedure	Catego		SOE	Adults RRI		Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI cervical spine without IV contrast	May bappropr (Disagree	iate	Expert Opinion	O 0 mSv		O 0 mSv [ped]	5	5	1	0	1	2	11	1	1	1	0
			References			Study	Quality										
			141 (14510932))			2										
			140 (31820439))			4										
			147 (31495544))			2										
			138 (35332024))			4										
			142 (27927894) Expert				2										
CTA neck with IV contrast	Usually appropr		142 (27927894) Expert)	��� 0.3- 3 mSv [ped]	1	1	14	0	1	0	2	0	0	0	1
CT myelography cervical spine	Usually appropr		Expert Consensus mSv Expert Propert Market 1-10 mSv Expert Propert 10-30			��� 0.3- 3 mSv [ped]	1	1	15	1	1	0	0	0	0	0	1
CT cervical spine with IV contrast	Usually appropr		Limited	&& 1-10 mSv)	���� 3- 10 mSv [ped]	1	1	16	0	0	1	0	0	0	0	1
			References		•	Study	Quality							•			
			140 (31820439))			4										
			138 (35332024))			4										
			142 (27927894))			2								_		
CT cervical spine without IV contrast	Usually appropr					���� 3- 10 mSv [ped]	1	1	12	3	1	0	2	0	0	0	0
			References			Study	Quality										
			140 (31820439))			4										

		138 (35332024)				4										
	-	142 (27927894)				2										
CT cervical spine without and with IV contrast	Usually	Limited	��� 1-10 mSv)	���� 3- 10 mSv [ped]	1	1	16	0	0	0	0	1	0	0	1
		References			Study	Quality		•								
		140 (31820439))			4										
		138 (35332024))			4										
		142 (27927894))			2										
Radiographic myelography cervical spine	Usually appropr	Expert Consensus	��� 1-10 mSv)		1	1	16	0	0	0	1	0	0	0	1
MRA neck without IV contrast	Usually approp	Expert Consensus	O 0 mSv		O 0 mSv [ped]	1	1	17	1	0	0	0	0	0	0	0
MRA neck without and with IV contrast	Usually approp	Expert Consensus	O 0 mSv		O 0 mSv [ped]	1	1	14	1	0	1	1	0	0	0	1
MRI cervical spine without and with IV contrast	Usually approp	Strong	O 0 mSv		O 0 mSv [ped]	1	1	15	0	2	0	0	0	1	0	0
		References			Study	Quality										
		141 (14510932))			2										
		140 (31820439))			4										
		147 (31495544))			2										
		138 (35332024))			4										
		142 (27927894))			2			,							
Radiography cervical spine	Usually	Limited	�� 0.1-1m\$		�� 0.03- 0.3 mSv [ped]	1	1	10	2	1	2	2	1	0	0	0
		References			Study	Quality										
		140 (31820439))			4										
		138 (35332024))			4										
		 142 (27927894))			2				ı	ı	ı			ı	
Radiography cervical spine flexion extension lateral views	Usually approp	Limited	�� 0.1-1mS	Sv		1	1	15	2	0	0	0	1	0	0	0

			References			Study	Quality										
			140 (31820439))			4										
			138 (35332024)				4										
			142 (27927894)				2										
MRA neck with IV contrast	Usually approp		Expert Consensus	O 0 mSv	/	O 0 mSv [ped]	1	1	14	1	0	1	1	0	0	0	1
MRI cervical spine with IV contrast	Usually approp		Expert Consensus O		/	O 0 mSv [ped]	1	1	14	0	2	0	1	0	0	0	1
Bone scan whole body with SPECT or SPECT/CT cervical spine	Usually approp	y not oriate	Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	16	0	0	0	1	0	0	1	0
			References		Study Quality												
			41 (34698290)				4										
			81 (28681193)				2										

Variant 7: Adult. Chronic cervical pain without radiculopathy. No trauma or "red flags." Initial imaging.

D .	Appropri	ateness	SS COE ALL DRY DIDRY D. C. M. C.		3.6.11			F	inal '	Tabu	latio	ns					
Procedure	Categ	ory	SOE	Adults RR	KL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI cervical spine without IV contrast	May approp	be riate	Strong	O 0 mSv	/	O 0 mSv [ped]	5	5	1	0	1	3	12	1	0	0	0
			References			Study	Quality										
			1 (25659245)				4										
			60 (25430861)				4										
			47 (17088193)				3										
			46 (9460946)				2										
			148 (34929370)	1			2										
Radiography cervical spine	May approp	be riate	Limited	�� 0.1-1m	nSv	�� 0.03- 0.3 mSv [ped]	5	5	1	0	0	3	8	4	2	0	0
			References			Study	Quality										

67 (33025192) 2 CTA neck with IV contrast **∞∞ 0.3**-**२० २०** 1-10 Usually not Expert 3 mSv 1 15 0 2 0 0 0 0 0 1 mSv appropriate Consensus [bed] CT myelography cervical spine **\$\$\$** 0.3-Usually not **⊕⊕⊕⊕** 10-30 Expert 15 0 0 3 mSv 1 1 1 0 0 0 1 Consensus mSv appropriate [ped] CT cervical spine with IV contrast **₩₩₩** 3-**२० २०** 1-10 Usually not Expert 0 0 0 10 mSv 1 1 16 0 0 0 1 appropriate mSv Consensus [ped] CT cervical spine without IV **₩₩₩** 3-**२० २** 1-10 Usually not Expert 10 mSv 1 1 11 3 2 0 0 0 0 contrast appropriate mSv Consensus [bed] CT cervical spine without and with **☆☆☆☆** 3-Usually not **⊕ ⊕ ⊕ ⊕** 1-10 Expert IV contrast 10 mSv 16 0 0 0 0 0 0 1 1 appropriate Consensus mSv [ped] Discography cervical spine Usually not Expert **��** 0.1-1mSv 16 0 0 0 0 0 0 1 Consensus appropriate Radiographic myelography Usually not **२० २०** 1-10 Expert 15 1 1 1 0 0 0 0 0 cervical spine appropriate mSv Consensus MRA neck without IV contrast Usually not O 0 mSv Expert 15 O 0 mSv 1 0 0 0 0 0 1 1 Consensus [ped] appropriate

References	Study Quality
1 (25659245)	4
60 (25430861)	4
47 (17088193)	3
46 (9460946)	2
148 (34929370)	2

O 0 mSv

O 0 mSv

O 0 mSv

[ped]

O 0 mSv

[ped]

16

13 0

1

1

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0

1

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0

1

2

MRA neck without and with IV

MRI cervical spine without and

contrast

with IV contrast

Usually not

appropriate

Usually not

appropriate

Expert

Consensus

Strong

Radiography cervical spine flexion extension lateral views	Usuall approp	Limited	Limited �� 0.1-1mSv			1	1	11	2	0	1	3	1	0	0	0
		References		Study	Quality											
		67 (33025192)				2					_		_			
MRA neck with IV contrast	Usuall approp	Expert Consensus	O 0 mSv	′	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRI cervical spine with IV contrast	Usuall _i	Expert Consensus	O 0 mSv	′	O 0 mSv [ped]	1	1	14	1	2	0	0	0	0	0	1
Bone scan whole body with SPECT or SPECT/CT cervical spine	Usuall approp	Limited	��� 1-10 mSv	0	���� 3- 10 mSv [ped]	1	1	15	1	0	1	0	0	1	0	0
		References			Study	Quality										
		150 (23412368)			3										
		151 (25985461	151 (25985461)			4										
		41 (34698290)				4										

Variant 8: Adult. Chronic cervical pain with radiculopathy. No trauma or "red flags." Initial imaging.

D 1	Appropriateness	COF	A L L DDI	D I DDI	D 4	3.6.19			F	inal '	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI cervical spine without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	1	0	0	0	3	1	5	3	5

References	Study Quality
1 (25659245)	4
69 (19525791)	3
60 (25430861)	4
47 (17088193)	3
55 (21047885)	2
46 (9460946)	2
68 (2847516)	4
155 (30324384)	2

			159 (30343168))			2										
			157 (29095415))			2										
			158 (27548342))			2										
			156 (36317351))			1										
			160 (33530213))			2										
			67 (33025192)				2										
			70 (35434382)				2										
CT cervical spine without IV contrast	May approp		Strong	��� 1-10 mSv	0	���� 3- 10 mSv [ped]	5	5	1	0	0	2	13	2	0	0	0
			References			Study	Quality										
			42 (17379279)			Inac	lequate										
			62 (16632616)				2										
			43 (20006557)				1										
			153 (35765137))			1										
			44 (35699680)				2										
			45 (28753389)				2										
			63 (26175589)				2										
Radiography cervical spine	May approp (Disagree	riate	Expert Opinion	�� 0.1-1m	ıSv	�� 0.03- 0.3 mSv [ped]	5	5	0	1	1	2	9	3	2	0	0
			References			Study	Quality										
			67 (33025192)				2										
			71 (35276718)				2										
CTA neck with IV contrast	Usually approp		Expert Consensus	��� 1-10 mSv	0	��� 0.3- 3 mSv [ped]	1	1	15	1	1	0	0	0	0	0	1
CT myelography cervical spine	Usually approp		Limited	���� 10∹ mSv	30	��� 0.3- 3 mSv [ped]	1	1	15	2	0	0	0	1	0	0	0
			References			Study	Quality										
			64 (21616277)				4										
			154 (23179977))			4										
			65 (27432666)				4										
			05 (27 152000)														

66 (32058837) 4 CT cervical spine with IV contrast **₩₩₩** 3-**२० २** 1-10 Usually not Expert 10 mSv 1 16 0 0 0 0 0 0 1 mSv appropriate Consensus [ped] **☆☆☆☆ 3**-CT cervical spine without and with Usually not Expert **२० २०** 1-10 10 mSv 14 2 0 0 0 0 IV contrast 1 1 1 0 1 appropriate mSv Consensus [ped] Discography cervical spine Usually not **⊕** ⊕ 0.1-1mSv 16 0 0 0 0 0 0 1 Limited 1 1 1 appropriate Study Quality References 40 (18204385) 4 Radiographic myelography **२० २** 1-10 Usually not **Expert** 14 1 0 1 0 0 0 1 1 1 1 cervical spine appropriate mSv Consensus MRA neck without IV contrast O 0 mSv Usually not Expert 16 0 0 0 O 0 mSv 1 0 1 0 0 1 appropriate Consensus [ped] MRA neck without and with IV O 0 mSv Usually not Expert O 0 mSv 0 0 0 0 0 1 16 1 0 1 contrast [ped] appropriate Consensus MRI cervical spine without and Usually not O 0 mSv O 0 mSv 16 2 Strong 1 0 0 0 0 0 0 0 with IV contrast appropriate [ped]

r		[[]		
	References	Study	Quality	
	1 (25659245)		4	
	69 (19525791)		3	
	60 (25430861)		4	
	47 (17088193)		3	
	55 (21047885)		2	
	46 (9460946)		2	
	68 (2847516)		4	
	155 (30324384)		2	
	159 (30343168)		2	
	157 (29095415)		2	
	158 (27548342)		2	
	156 (36317351)		1	

			160 (33530213))			2										
			70 (35434382)				2										
Radiography cervical spine flexion extension lateral views	Usuall approp	y not oriate	Strong	�� 0.1-1m	nSv		1	1	11	1	2	0	3	1	0	0	0
			References			Study	Quality										
			67 (33025192)				2										
			71 (35276718)				2										
MRA neck with IV contrast	Usuall approp		Expert Consensus	O 0 mSv	/	O 0 mSv [ped]	1	1	16	0	0	1	0	0	0	0	1
MRI cervical spine with IV contrast	Usuall approp	y not oriate	Expert Consensus	O 0 mS\	/	O 0 mSv [ped]	1	1	15	1	0	0	0	0	1	0	1
Bone scan whole body with SPECT or SPECT/CT cervical spine	Usuall approp		Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	15	1	0	0	1	0	1	0	0
		1	D C		ı		0 11.										

References	Study Quality
150 (23412368)	3
151 (25985461)	4
41 (34698290)	4

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.