

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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography cervical spine	May be appropriate	Limited	☹☹ 0.1-1mSv	☹☹ 0.03-0.3 mSv [ped]	5	5	0	0	0	3	8	7	0	0	0
		References		Study Quality											
		48 (24968795)		4											
		49 (9224245)		4											
CTA neck with IV contrast	Usually not appropriate	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	Usually not appropriate	Expert Consensus	☹☹☹☹ 10-30 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	16	0	0	1	0	0	0	0	1
CT cervical spine with IV contrast	Usually not appropriate	Strong	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	15	1	0	0	1	0	0	1	0
		References		Study Quality											
		42 (17379279)		Inadequate											
		43 (20006557)		1											
		44 (35699680)		2											
		45 (28753389)		2											
CT cervical spine without IV contrast	Usually not appropriate	Strong	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	14	3	1	0	0	0	0	0	0
		References		Study Quality											

42 (17379279)	Inadequate
43 (20006557)	1
44 (35699680)	2
45 (28753389)	2

CT cervical spine without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	16	0	0	0	1	0	0	0	1
Discography cervical spine	Usually not appropriate	Expert Consensus	☼☼ 0.1-1mSv		1	1	16	0	0	1	0	0	0	1	0
Radiographic myelography cervical spine	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	16	0	0	0	0	1	0	0	1
MRA neck without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRA neck without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRI cervical spine without IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	14	2	2	0	0	0	0	0	0

References	Study Quality
1 (25659245)	4
47 (17088193)	3
46 (9460946)	2

MRI cervical spine without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	14	1	1	0	1	0	0	0	1
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References	Study Quality
1 (25659245)	4
47 (17088193)	3
46 (9460946)	2

Radiography cervical spine flexion extension lateral views	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	13	2	3	0	0	0	0	0	0
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References	Study Quality
48 (24968795)	4

		49 (9224245)			4												
MRA neck with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 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	0 0 mSv	0 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	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI cervical spine without IV contrast	May be appropriate	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 be appropriate	Strong	⊕⊕⊕ 0.1-1mSv	⊕⊕⊕ 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 not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0	0	1		
CT myelography cervical spine	Usually not appropriate	Limited	☹☹☹☹ 10-30 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	12	0	2	2	0	1	1	0	0				
		References		Study Quality															
		64 (21616277)		4															
		65 (27432666)		4															
		66 (32058837)		4															
CT cervical spine with IV contrast	Usually not appropriate	Strong	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	16	0	0	0	1	0	1	0	0				
		References		Study Quality															
		42 (17379279)		Inadequate															
		62 (16632616)		2															
		43 (20006557)		1															
		44 (35699680)		2															
		45 (28753389)		2															
		63 (26175589)		2															
CT cervical spine without IV contrast	Usually not appropriate	Strong	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	11	1	1	4	1	0	0	0	0				
		References		Study Quality															
		42 (17379279)		Inadequate															
		62 (16632616)		2															
		43 (20006557)		1															
		44 (35699680)		2															
		45 (28753389)		2															
		63 (26175589)		2															
CT cervical spine without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	15	1	0	0	1	0	0	0	0	1			

Radiographic myelography cervical spine	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	13	1	1	0	1	1	0	0	1
MRA neck without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRA neck without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
MRI cervical spine without and with IV contrast	Usually not appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	1	1	14	1	0	0	1	0	2	0	0

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 flexion extension lateral views	Usually not appropriate	Strong	☼☼ 0.1-1mSv		1	1	11	4	1	0	1	1	0	0	0
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References	Study Quality
67 (33025192)	2
71 (35276718)	2

MRA neck with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 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	○ 0 mSv	○ 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 not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	16	0	1	0	0	0	0	1	0

References	Study 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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							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											
MRI cervical spine without IV contrast	Usually appropriate	Limited	○ ○ mSv	○ ○ 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	☹☹ 0.03-0.3 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	0 0 mSv	0 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														

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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							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		Study Quality											
		94 (25296275)		4											
		103 (22677300)		4											
		97 (30527522)		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		Study 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		Study Quality											
		94 (25296275)		4											
		113 (11316355)		4											
		103 (22677300)		4											
		99 (23122265)		4											
		100 (20876624)		4											
Gallium scan whole body	Usually not appropriate	Strong	☼☼☼☼ 10-30 mSv		2	2	9	0	4	0	3	1	1	0	0
		References		Study 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 not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	10	1	2	1	3	0	1	0	0
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References	Study 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	0	1	1	3	0	0	0	1
Discography cervical spine	Usually not appropriate	Expert Consensus	☼☼ 0.1-1mSv		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	0	1	1	1	0	0	0	1
MRA neck without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 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	○ 0 mSv	○ 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
WBC scan whole body	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	13	3	2	0	0	0	0	0	0

References	Study Quality
115 (29256136)	2
114 (19182734)	4

FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	17	1	0	0	0	0	0	0	0
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References	Study Quality
102 (25475377)	4
104 (11914890)	4
100 (20876624)	4
105 (18525363)	4

Radiography cervical spine	Usually not appropriate	Limited	☼☼ 0.1-1mSv	☼☼ 0.03-0.3 mSv [ped]	1	1	10	3	0	1	3	1	0	0	0
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References	Study Quality
94 (25296275)	4
113 (11316355)	4
103 (22677300)	4
99 (23122265)	4
100 (20876624)	4

MRA neck with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 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	○ 0 mSv	○ 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	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI cervical spine without and with IV contrast	Usually appropriate	Limited	○ 0 mSv	○ 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)		4													
		119 (28507888)		Inadequate													
		126 (22487970)		4													
		123 (23470032)		4													
MRI cervical spine without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	6	6	1	0	0	0	4	5	5	1	2		
		References		Study Quality													
		1 (25659245)		4													
		133 (25412631)		4													
		46 (9460946)		2													
		136 (26339464)		4													
		126 (22487970)		4													
		123 (23470032)		4													
CT cervical spine with IV contrast	May be appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	5	5	2	0	2	3	9	2	0	0	0		
		References		Study Quality													
		125 (18191356)		3													
		126 (22487970)		4													
		123 (23470032)		4													
		127 (-3197175)		4													
CT cervical spine without IV contrast	May be appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	5	5	0	0	0	2	13	2	1	0	0		
		References		Study Quality													
		125 (18191356)		3													
		126 (22487970)		4													
		123 (23470032)		4													
FDG-PET/CT whole body	May be appropriate	Moderate	☹☹☹☹ 10-30 mSv	☹☹☹☹ 3-10 mSv [ped]	5	5	7	0	0	1	8	0	1	1	0		
		References		Study Quality													
		129 (21887484)		Good													

126 (22487970)	4
128 (25475379)	4
130 (28250855)	4

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	☼☼☼ 0.3-3 mSv [ped]	1	1	11	0	0	2	4	0	0	0	1

References	Study 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	☼☼ 0.1-1mSv		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	○ 0 mSv	○ 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	○ 0 mSv	○ 0 mSv [ped]	1	1	14	0	1	1	1	0	0	0	1
Radiography cervical spine	Usually not appropriate	Limited	☼☼ 0.1-1mSv	☼☼ 0.03-0.3 mSv [ped]	1	1	10	2	2	2	1	0	0	1	0

References	Study Quality
136 (26339464)	4
137 (22487972)	4
123 (23470032)	4

Radiography cervical spine flexion extension lateral views	Usually not appropriate	Limited	☼☼ 0.1-1mSv		1	1	16	2	0	0	0	0	0	0	0
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		References	Study Quality													
		136 (26339464)	4													
		137 (22487972)	4													
		123 (23470032)	4													
MRA neck with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	14	0	1	1	1	0	0	0	1	
MRI cervical spine with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	16	1	0	1	0	0	0	0	0	
FDG-PET/MRI skull base to mid-thigh	Usually not appropriate	Strong	☼☼☼ 1-10 mSv		1	1	14	3	1	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	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	13	0	1	1	1	1	1	0	0	
		References	Study Quality													
		135 (19504092)	2													
		134 (28872551)	2													
		128 (25475379)	4													
Bone scan whole body with SPECT or SPECT/CT cervical spine	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	14	1	2	1	0	0	0	0	0	
		References	Study Quality													
		123 (23470032)	4													
		122 (22505821)	4													
		124 (35502272)	4													
FDG-PET/MRI whole body	Usually not appropriate	Strong	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	15	2	1	0	0	0	0	0	0	
		References	Study Quality													
		133 (25412631)	4													

132 (24907940)	1
131 (27540427)	2

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

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI cervical spine without IV contrast	May be appropriate (Disagreement)	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)		2											
CTA neck with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹ 0.3-3 mSv [ped]	1	1	14	0	1	0	2	0	0	0	1
CT myelography cervical spine	Usually not appropriate	Expert Consensus	☹☹☹☹ 10-30 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	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 not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 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 not appropriate	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 not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	16	0	0	0	1	0	0	0	1		
MRA neck without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	17	1	0	0	0	0	0	0	0		
MRA neck without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	14	1	0	1	1	0	0	0	1		
MRI cervical spine without and with IV contrast	Usually not appropriate	Strong	○ 0 mSv	○ 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 not appropriate	Limited	☼☼ 0.1-1mSv	☼☼ 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													
Radiography cervical spine flexion extension lateral views	Usually not appropriate	Limited	☼☼ 0.1-1mSv		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 not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	14	1	0	1	1	0	0	0	1	
MRI cervical spine with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 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 not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	16	0	0	0	1	0	0	1	0	
		References		Study Quality												
		41 (34698290)		4												
		81 (28681193)		2												

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI cervical spine without IV contrast	May be appropriate	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)		2											
Radiography cervical spine	May be appropriate	Limited	☢☢ 0.1-1mSv	☢☢☢ 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	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	15	0	2	0	0	0	0	0	0	1
CT myelography cervical spine	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼ 0.3-3 mSv [ped]	1	1	15	1	0	1	0	0	0	0	0	1
CT cervical spine with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	16	0	0	1	0	0	0	0	0	1
CT cervical spine without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	11	1	3	2	1	0	0	0	0	0
CT cervical spine without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	16	0	0	1	0	0	0	0	0	1
Discography cervical spine	Usually not appropriate	Expert Consensus	☼☼ 0.1-1mSv		1	1	16	0	0	1	0	0	0	0	0	1
Radiographic myelography cervical spine	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	15	1	0	0	0	1	0	0	0	1
MRA neck without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	15	1	1	0	0	0	0	0	0	1
MRA neck without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0	1
MRI cervical spine without and with IV contrast	Usually not appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	2	1	0	0	0	0	0	2

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

Radiography cervical spine flexion extension lateral views	Usually not appropriate	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	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 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	○ 0 mSv	○ 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	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	15	1	0	1	0	0	1	0	0
		References	Study Quality												
		150 (23412368)	3												
		151 (25985461)	4												
		41 (34698290)	4												

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							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												

		66 (32058837)	4												
CT cervical spine with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	16	0	0	1	0	0	0	0	1
CT cervical spine without and with IV contrast	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	14	2	0	0	1	0	0	0	1
Discography cervical spine	Usually not appropriate	Limited	☹☹ 0.1-1mSv		1	1	16	0	0	0	1	0	1	0	0

		References	Study Quality												
		40 (18204385)	4												
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	○ ○ mSv	○ ○ mSv [ped]	1	1	16	0	0	1	0	0	0	0	1
MRA neck without and with IV contrast	Usually not appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	1	1	16	0	0	1	0	0	0	0	1
MRI cervical spine without and with IV contrast	Usually not appropriate	Strong	○ ○ mSv	○ ○ mSv [ped]	1	1	16	2	0	0	0	0	0	0	0

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

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.