## American College of Radiology ACR Appropriateness Criteria®

## **Cervical Neck Pain or Cervical Radiculopathy**

Variant 1: New or increasing nontraumatic cervical or neck pain. No "red flags." Initial imaging.

	Appropria	ateness	207		_						F	inal '	<b>Tabu</b>	latio	ns		
Procedure	Catego	ory	SOE	Adults RRI		Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography cervical spine	Usual appropr		Limited	�� 0.1-1m\$	Sv	�� 0.03- 0.3 mSv [ped]	8	8	0	0	0	2	0	0	4	10	3
			References			Study	Quality										
			29 (24968795)				4										
			28 (9224245)				4										
			27 (17450072)				4										
MRI cervical spine without IV contrast	May t appropr (Disagree	riate	Expert Opinion	O 0 mSv		O 0 mSv [ped]	5	5	1	2	4	2	6	3	1	0	0
			References			Study	Quality										
			23 (9460946)				2										
			22 (26571180)				3										
CT cervical spine without IV contrast	May t appropr		Limited	��� 1-10 mSv	)	���� 3- 10 mSv [ped]	4	4	0	2	3	8	4	2	0	0	0
			References			Study	Quality										
			25 (24314582)				4										
			24 (17379279)			Inac	lequate										
CT cervical spine with IV contrast	Usually appropr	not riate	Limited	��⊕ 1-10 mSv	)	���� 3- 10 mSv [ped]	2	2	9	4	3	0	1	1	0	0	0
			References			Study	Quality										

		25 (24314582)			4										
		24 (17379279)		Inac	lequate										
MRI cervical spine without and with IV contrast	Usually approp	Limited	O 0 mSv	O 0 mSv [ped]	2	2	8	2	3	2	2	1	0	0	0
		References		Study	/ Quality										
		23 (9460946)			2										
		22 (26571180)			3										
CTA neck with IV contrast	Usually approp	Expert Consensus	<b>≎≎≎</b> 1-10 mSv	9	1	1	11	2	1	3	1	0	0	0	0
CT myelography cervical spine	Usually approp	Expert Consensus	<b>⊛⊛⊕⊕</b> 10-3 mSv	30	1	1	14	0	2	1	1	0	0	0	0
CT cervical spine without and with IV contrast	Usually approp	Limited	<b>≎≎≎</b> 1-10 mSv	9	1	1	13	1	2	1	0	1	0	0	0
		References		Study	Quality										
		25 (24314582)			4										
		24 (17379279)		Inac	dequate										
Discography cervical spine	Usually approp	Expert Consensus	�� 0.1-1m	Sv	1	1	14	1	3	0	0	0	0	0	0
Facet injection/medial branch block cervical spine	Usually approp	Expert Consensus	�� 0.1-1m	Sv	1	1	14	2	2	0	0	0	0	0	0
X-ray myelography cervical spine	Usually approp	Expert Consensus	<b>≎≎≎</b> 1-10 mSv	)	1	1	13	3	1	1	0	0	0	0	0
MRA neck without IV contrast	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	1	2	2	0	0	0	0
MRA neck with IV contrast	Usually approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	1	4	0	0	0	0	0
MRI cervical spine with IV contrast	Usually approp	Limited	O 0 mSv	O 0 mSv [ped]	1	1	11	2	4	1	0	0	0	0	0
		References		Study	/ Quality										

		23 (9460946) 22 (26571180)				2 3										
Tc-99m bone scan whole body with SPECT/CT neck	Usually approp	Limited	���� 10- mSv	30		1	1	13	1	4	0	0	0	0	0	0
		References 26 (23412368)			Study	Quality 3		•				•	•		•	

Variant 2: New or increasing nontraumatic cervical radiculopathy. No "red flags." Initial imaging.

Day of James	Appropriateness	COE	A 3-14- DDI	D. J. DDI	D - 42	M - 1!			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 IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	1	0	0	0	0	2	3	7	5
		References		Study	Quality										
		41 (27318668)			3										
		40 (2398088)			3										
		39 (17204882)			4										
		35 (2847516)			4										
		33 (21047885)			2										
		23 (9460946)			2										
		21 (8107998)			3										
CT cervical spine without IV contrast	May be appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	6	6	0	0	1	1	3	11	1	2	0
		References		Study	Quality										
		36 (16632616)			2										
		35 (2847516)			4										
Radiography cervical spine	May be appropriate (Disagreement)	Expert Opinion	�� 0.1-1mSv	�� 0.03- 0.3 mSv [ped]	5	6	0	0	1	4	3	6	1	1	2
		References		Study	Quality										
		42 (14077981)			4										

X-ray myelography cervical spine	Usually not appropriate	Limited	��� 1-10 mSv		3	3	7	2	2	3	2	1	1	0	0
		References		Study	Quality										
		17 (-3130497)			4										
MRI cervical spine without and with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	3	3	5	3	4	1	3	2	0	0	0
		References		Study	Quality										
		41 (27318668)			3										
		40 (2398088)			3										
		39 (17204882)			4										
		35 (2847516)			4										
		33 (21047885)			2										
		23 (9460946)			2										
		21 (8107998)			3										
CT myelography cervical spine	Usually not appropriate	Strong	୫୫୫୫ 10-30 mSv	��� 0.3- 3 mSv [ped]	2	2	7	3	3	4	1	0	1	0	0
		References		Study	Quality		•								
		38 (9534693)			2										
		37 (3823440)			2										
CTA neck with IV contrast	Usually not appropriate	Expert Consensus	��� 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	10	4	2	1	1	0	0	0	0
CT cervical spine with IV contrast	Usually not appropriate	Limited	<b>⊕⊕⊕</b> 1-10 mSv	���� 3- 10 mSv [ped]	1	1	10	1	5	1	1	0	0	0	0
		References		Study	Quality										
		36 (16632616)			2										
		35 (2847516)			4										
CT cervical spine without and with IV contrast	Usually not appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	12	2	2	2	0	0	0	0	0
		References		Study	Quality										

	Г		26 (16622616)			2										
			36 (16632616) 35 (2847516)			4										
D: 1 . 1 .			·			<u>4</u>	1									
Discography cervical spine	Usually appropr	not iate	Expert Consensus	�� 0.1-1mS	Sv	1	1	12	3	3	0	0	0	0	0	0
Facet injection/medial branch block cervical spine	Usually appropr		Expert Consensus	�� 0.1-1mS	Sv	1	1	15	2	1	0	0	0	0	0	0
MRA neck without IV contrast	Usually appropr		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	4	0	1	0	0	0	0
MRA neck with IV contrast	Usually appropr		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	1	4	0	1	0	0	0	0
MRI cervical spine with IV contrast	Usually appropr		Strong	O 0 mSv	O 0 mSv [ped]	1	1	11	1	0	4	1	0	1	0	0
			References		Stud	y Quality										
			41 (27318668)			3										
			40 (2398088)			3										
			39 (17204882)			4										
			35 (2847516)			4										
			33 (21047885)			2										
			23 (9460946)			2										
			21 (8107998)			3										
Tc-99m bone scan whole body with SPECT/CT neck	Usually appropr		Expert Consensus	���� 10-30 mSv	0	1	1	14	1	2	0	1	0	0	0	0

Variant 3: Prior cervical spine surgery. New or increasing nontraumatic cervical or neck pain or radiculopathy. Initial imaging.

<b>D</b> 1	Appropriateness	COF	A L L DDI	D 1 DD1	D (*	3.6.31			F	inal '	Гаbи	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography cervical spine	Usually appropriate	Limited	�� 0.1-1mSv	�� 0.03- 0.3 mSv [ped]	8	8	1	0	1	0	0	2	2	4	8

		References		Study	Quality										
		66 (23578991)			3										
		65 (19096562)			4										
		64 (18628706)			4										
		63 (21178831)			3										
		62 (24183750)			4										
		61 (19665192)			4										
		60 (23242622)			2										
CT cervical spine without IV contrast	Usually appropriate	Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	7	7	1	0	1	0	1	1	6	5	3
		References		Study	Quality										
		53 (26430596)			3										
		52 (23479714)			4										
		51 (23318108)		Not A	Assessed										
		50 (23118135)			4										
		49 (16889148)			2										
		48 (18469691)			2										
MRI cervical spine without IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	7	2	0	1	1	1	1	6	4	3
		References		Study	Quality		-								
		55 (11371319)			4										
		54 (-3127628)			4										
		23 (9460946)			2										
		22 (26571180)			3										
MRI cervical spine without and with IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	0	0	2	4	9	1	2	0	1
		References		Study	Quality				-						_
		Kelelelices		Bruay	Z 3131223										
		57 (2119123)		Study	4										
				Staty											

		54 (-3127628)			4										
		23 (9460946)			2										
		22 (26571180)			3										
CT myelography cervical spine	May be appropriate	Limited	���� 10-30 mSv	��� 0.3- 3 mSv [ped]	4	4	6	1	2	8	1	1	0	0	0
		References			y Quality			•	•	•	•				
		37 (3823440)			2										
X-ray myelography cervical spine	Usually not appropriate	Limited	��� 1-10 mSv		3	3	6	1	5	4	2	0	0	0	0
		References		Study	y Quality					•					
		17 (-3130497)		_	4										
CT cervical spine with IV contrast	Usually not appropriate	Strong	<b>���</b> 1-10 mSv	���� 3- 10 mSv [ped]	2	2	9	1	3	2	1	1	1	0	0
		References		Study	y Quality										
		53 (26430596)			3										
		52 (23479714)			4										
		51 (23318108)		Not A	Assessed										
		50 (23118135)			4										
		49 (16889148)			2										
		48 (18469691)		1	2					1					
MRI cervical spine with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	2	2	7	4	3	1	1	1	1	0	0
		References		Study	y Quality										
		57 (2119123)			4										
		56 (2966418)			2										
		55 (11371319)			4										
		54 (-3127628)			4										
		23 (9460946)			2										
		22 (26571180)			3										

CTA neck with IV contrast	Usually not appropriate	Expert Consensus	&&⊕ 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	11	3	2	1	1	0	0	0	0
CT cervical spine without and with IV contrast	Usually not appropriate	Strong	<b>≎</b>	≎≎≎≎ 3- 10 mSv [ped]	1	1	11	2	1	1	1	0	1	1	0
		References		Study	y Quality										
		53 (26430596)	)		3										
		52 (23479714)	)		4										
		51 (23318108)	)	Not A	Assessed										
		50 (23118135)	)		4										
		49 (16889148)			2										
		48 (18469691)	)		2					1	1				
Discography cervical spine	Usually not appropriate	Expert Consensus	<b>⊕⊕</b> 0.1-1mS	v	1	1	12	4	1	1	0	0	0	0	0
Facet injection/medial branch block cervical spine	Usually not appropriate	Expert Consensus	�� 0.1-1mS	SV	1	1	14	3	1	0	0	0	0	0	0
MRA neck without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	1	5	0	1	0	0	0	0
MRA neck with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	4	1	0	0	0	0	0
Tc-99m bone scan whole body with SPECT/CT neck	Usually not appropriate	Limited	���� 10-30 mSv	)	1	1	10	1	4	1	2	0	0	0	0
		References		Study	y Quality										
		59 (9171175)		3											
		58 (11037993)		1											

Variant 4: Suspicion for infection with new or increasing nontraumatic cervical or neck pain or radiculopathy. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations  1 2 3 4 5 6 7 8 9

ъ 1	Appropriateness	COF	ALL DDI	D I DDI	D (1	37.11			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	Strong	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	0	0	0	1	2	14
		References		Study	Quality										
		80 (12594568)			4										
		79 (15776239)			3										
		78 (11199429)			2										
		77 (12802004)			2										
		76 (3875878)		2											
		69 (25952173)		4											
		68 (25296275)			4										
CT cervical spine with IV contrast	May be appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	6	6	0	0	1	1	1	8	5	3	0
		References		Study	Quality										
		70 (22677300)			4										
		69 (25952173)			4			_	_	_					
MRI cervical spine without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	1	0	0	2	1	7	6	2	0
		References		Study	Quality										
		80 (12594568)			4										
		79 (15776239)			3										
		78 (11199429)			2										
		77 (12802004)			2										
		76 (3875878)			2										
		69 (25952173)			4										
		68 (25296275)			4										
CT cervical spine without IV contrast	May be appropriate (Disagreement)	Expert Opinion	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	1	0	2	5	3	3	4	1	0
		References		Study	Quality										

			70 (22 (77 200)				4										
			70 (22677300)				4										
Radiography cervical spine	May approp (Disagre	riate	69 (25952173)  Expert Opinion	<b>⊕⊕</b> 0.1-1mS		0.03- 0.3 mSv [ped]	5	5	0	1	1	2	8	3	2	1	1
	(8		References		•		Quality										
			82 (11316355)				4										
			81 (11316362)				4										
MRI cervical spine with IV contrast	May approp (Disagre	riate	Expert Opinion	O 0 mSv	(	O 0 mSv [ped]	5	4	3	2	3	2	2	4	2	0	1
		References Study Quality															
			80 (12594568)				4										
			79 (15776239)				3										
			78 (11199429)		2												
			77 (12802004)				2										
			76 (3875878)				2										
			69 (25952173)				4										
			68 (25296275)				4										
CT cervical spine without and with IV contrast	Usuall approp		Limited	��� 1-10 mSv		≎≎≎≎ 3- 10 mSv [ped]	3	3	7	1	7	2	0	0	2	0	0
	•		References			Study	Quality										
			70 (22677300)				4										
			69 (25952173)				4										
FDG-PET/CT skull base to mid-thigh	Usuall approp	70 (22677300) 69 (25952173) y not Limited \$\phi \phi \phi \phi \phi \phi \phi \phi				\$\$\$\$\$ 10-30 mSv [ped]	3	3	8	1	7	1	1	1	0	0	0
		References				Study	Quality										
			73 (9364643)				4										
			72 (25475377)			4											
			71 (29256136)				2										

Tc-99m bone scan whole body with SPECT/CT neck	Usuall approp	Limited	���� 10- mSv	30	3	3	7	1	4	0	4	1	1	0	0
		References		Stud	y Quality										
		76 (3875878)			2										
CT myelography cervical spine	Usuall approp	Expert Consensus	<b>����</b> 10- mSv	30 🕏 🏵 🕏 0.3- 3 mSv [ped]	2	2	9	3	3	1	2	0	0	0	0
In-111 WBC scan whole body	Usuall approp	Expert Consensus	���� 10- mSv	30	2	2	9	1	3	2	1	2	0	0	0
Ga-67 scan whole body	Usuall approp	Limited	���� 10- mSv	30	2	2	7	3	9	0	0	0	0	0	0
		References	•	Stud	y Quality		•	•	•		•				
		75 (26848173)	2												
		74 (11129162)			3										
CTA neck with IV contrast	Usuall approp	Expert Consensus	&& 1-1 mSv	0	1	1	11	2	2	2	1	0	0	0	0
Discography cervical spine	Usuall approp	Expert Consensus	�� 0.1-1m		1	1	14	2	1	0	1	0	0	0	0
Facet injection/medial branch block cervical spine	Usuall approp	Expert Consensus	�� 0.1-1m	ıSv	1	1	16	1	1	0	0	0	0	0	0
X-ray myelography cervical spine	Usuall approp	Limited	��� 1-1 mSv	0	1	1	12	2	1	2	1	0	0	0	0
		References		Stud	y Quality		•								
		17 (-3130497)			4										
MRA neck without IV contrast	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	2	2	2	1	0	0	0	0
MRA neck with IV contrast	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	2	3	1	0	0	0	0	0

Variant 5: Known malignancy. New or increasing nontraumatic cervical or neck pain or radiculopathy. Initial imaging.

	Appropriateness								F	inal	Tabu	latio	ıs		
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	0	2	4	11
		References		Study	Quality		•	•	•	•	•				
		94 (-3127654)			4										
		88 (25412631)			4										
MRI cervical spine without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	2	0	4	8	4	1
		References Study Quality													
		References Study Quality 94 (-3127654) 4													
		88 (25412631) 4													
Radiography cervical spine	May be appropriate	Limited	<b>≎⊕</b> 0.1-1mSv	�� 0.03- 0.3 mSv [ped]	6	6	0	0	1	1	7	3	3	1	2
		References		Study	Quality										
		97 (-3127649)			4										
		87 (18191356)			3										
CT cervical spine with IV contrast	May be appropriate (Disagreement)	Expert Opinion	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	0	2	2	5	3	4	2	1	0
		References		Study	Quality		•								
		89 (6831145)			3										
		88 (25412631)			4										
		87 (18191356)			3										
		86 (17890090)			2										
CT cervical spine without IV contrast	May be appropriate (Disagreement)	Expert Opinion	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	6	0	0	2	5	0	7	3	2	0
		References		Study	Quality Quality										
		89 (6831145)			3										

		88 (25412631)			4										
		87 (18191356)			3										
		86 (17890090)			2										
MRI cervical spine with IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	4	1	3	5	4	0	3	2	1	0
	-	References		Study	y Quality						•				
		94 (-3127654)			4										
		88 (25412631)			4										
Tc-99m bone scan whole body with SPECT/CT neck	May be appropriate	Limited	���� 10-30 mSv		4	4	4	2	3	3	6	1	0	0	0
		References		Study	y Quality						•	•			
		96 (11142324)		_	4										
		96 (11142324) 4 95 (26339464) 4													
		36 (16632616)			2										
FDG-PET/CT whole body	Usually not appropriate	Limited	���� 10-30 mSv		3	3	7	1	6	1	1	2	0	0	0
		References		Study	y Quality				•		•	•	•		
		93 (25533313)	,		2										
		92 (20015657)	,		4										
CTA neck with IV contrast	Usually not appropriate	Expert Consensus	��⊕ 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	10	2	4	1	1	0	0	0	0
CT myelography cervical spine	Usually not appropriate	Expert Consensus	���� 10-30 mSv	��� 0.3- 3 mSv [ped]	1	1	12	1	1	1	3	0	0	0	0
CT cervical spine without and with IV contrast	Usually not appropriate	Limited	��⊕ 1-10 mSv	���� 3- 10 mSv [ped]	1	1	10	2	5	0	1	0	1	0	0
		References		Study	y Quality										·
		89 (6831145)			3										
		88 (25412631)	)		4										

3

87 (18191356)

			86 (17890090)				2										
Discography cervical spine	Usuall approp		Expert Consensus	�� 0.1-1m	าริง		1	1	14	3	1	0	0	0	0	0	0
Facet injection/medial branch block cervical spine	Usuall approp		Expert Consensus	�� 0.1-1m	าริง		1	1	16	1	1	0	0	0	0	0	0
X-ray myelography cervical spine	Usuall approp		Limited	<b>≎≎≎</b> 1-1 mSv	0		1	1	11	2	2	3	0	0	0	0	0
			References		Study	Quality											
			17 (-3130497)				4										
MRA neck without IV contrast	Usuall approp		Expert Consensus	O 0 mSv	,	O 0 mSv [ped]	1	1	11	2	4	0	1	0	0	0	0
MRA neck with IV contrast	Usuall approp		Expert Consensus	O 0 mSv	/	O 0 mSv [ped]	1	1	11	3	4	0	0	0	0	0	0
F-18 NaF PET/CT whole body	Usuall approp		Limited	���� 10- mSv	-30		1	1	13	3	2	0	0	1	0	0	0
		References				Study	Quality										
			91 (28872551)				2										
			90 (27634981)				4										

Variant 6: Cervicogenic headache and new or increasing nontraumatic cervical or neck pain. No neurologic deficit. Initial imaging.

D 1	Appropriateness	COF	A L I/ DDI	D I DDI	D 4	3.7.11			F	inal '	Гаbu	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	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	3	0	1	3	6	3	1	2	0

References	Study Quality
104 (14510932)	2
103 (2743413)	4

Radiography cervical spine	May b		Limited	�� 0.1-1m	ıSv	�� 0.03- 0.3 mSv [ped]	5	5	0	0	2	6	4	5	1	1	0
			References			Study	Quality										
			104 (14510932)	1			2										
			103 (2743413)				4										
CT cervical spine without IV contrast	May b		Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	4	4	1	0	2	9	4	2	1	0	0
			References			Study	Quality										
			104 (14510932)	)			2										
			103 (2743413)				4										
Facet injection/medial branch block cervical spine	May b appropri		Expert Consensus	�� 0.1-1m	ıSv		4	4	4	2	3	6	2	2	0	0	0
Tc-99m bone scan whole body with SPECT/CT neck	Usually appropri		Limited	���� 10- mSv	30		3	3	7	1	3	3	2	1	1	0	0
		•				Study	Quality										
			106 (19643679)	1			4										
			105 (27262701)	)			4										
			36 (16632616)				2										
MRI cervical spine without and with IV contrast	Usually appropri		Limited	O 0 mS\	/	O 0 mSv [ped]	2	2	9	0	1	3	4	1	0	0	0
			References			Study	Quality				•	•	•				
			104 (14510932)	)			2										
			103 (2743413)				4										
CTA neck with IV contrast	Usually appropri		Expert Consensus	��� 1-1 mSv	0	��� 0.3- 3 mSv [ped]	1	1	10	1	1	3	2	0	1	0	0
CT myelography cervical spine	Usually appropri		Expert Consensus	���� 10- mSv	30	��� 0.3- 3 mSv [ped]	1	1	14	2	2	0	0	0	0	0	0
CT cervical spine with IV contrast	Usually appropri		Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	13	2	2	0	1	0	0	0	0

		Deferences Study Quality														
			References		Stı	ıdy Quality										
			104 (14510932)	)		2										
			103 (2743413)			4										
CT cervical spine without and with IV contrast	Usuall approp		Limited	��� 1-1 mSv	0 \$300 3 10 mSv [ped]	1	1	13	1	3	1	0	0	0	0	0
			References		Stı	dy Quality										
			104 (14510932)		2											
			103 (2743413)		4											
Discography cervical spine	Usuall approp		Expert Consensus	�� 0.1-1m	ıSv	1	1	10	2	1	1	2	1	1	0	0
X-ray myelography cervical spine	Usuall approp		Expert Consensus	<b>⊕⊕⊕</b> 1-1 mSv	0	1	1	13	2	3	0	0	0	0	0	0
MRA neck without IV contrast	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	1	1	4	1	1	0	0	0
MRA neck with IV contrast	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	2	1	2	2	0	1	0	0
MRI cervical spine with IV contrast	Usuall approp		Limited	O 0 mSv	O 0 mSv [ped]	1	1	11	1	3	1	2	0	0	0	0
			References			dy Quality		•								
			104 (14510932)			2										
			103 (2743413)			4										

## Variant 7: Chronic cervical or neck pain. Initial imaging.

D 1	Appropri	ateness	COE	4 1 14 DD		D I DDI	D 41	3.7.11			F	inal '	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RR	KL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography cervical spine	Usua approp	.*	Limited	<b>��</b> 0.1-1m	nSv	�� 0.03- 0.3 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
			References			Study	Quality										

					I												
			108 (3787320)				2										
			107 (17347239)	)			4			1	1	ı		1	ı	<u> </u>	
MRI cervical spine without IV contrast	May approp (Disagre	riate	Expert Opinion	O 0 mSv	,	0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
			References			Study	Quality										
			23 (9460946)				2										
			22 (26571180)				3										
CT cervical spine without IV contrast	Usuall approp		Expert Consensus	��� 1-10 mSv		��� 3- 10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0
MRI cervical spine without and with IV contrast	Usuall approp		Limited	O 0 mSv	,	0 mSv [ped]	2	n/a	0	0	0	0	0	0	0	0	0
			References			Study	Quality										
			23 (9460946)				2										
			22 (26571180)				3										
Tc-99m bone scan whole body with SPECT/CT neck	Usuall approp		Limited	���� 10- mSv	-30		2	n/a	0	0	0	0	0	0	0	0	0
			References			Study	Quality		•								
			106 (19643679)	)			4										
CTA neck with IV contrast	Usuall approp		Expert Consensus	��� 1-10 mSv		�� 0.3- 3 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
CT myelography cervical spine	Usuall approp		Expert Consensus	���� 10- mSv		�� 0.3- 3 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
CT cervical spine with IV contrast	Usuall approp		Expert Consensus	��� 1-10 mSv		•��≎ 3- 10 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
CT cervical spine without and with IV contrast	Usuall approp		Expert Consensus	��� 1-10 mSv		9999 3- 10 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
Discography cervical spine	Usuall approp		Expert Consensus	�� 0.1-1m	nSv		1	n/a	0	0	0	0	0	0	0	0	0

Facet injection/medial branch block cervical spine	Usually not appropriate	Expert Consensus	�� 0.1-1mSv		1	n/a	0	0	0	0	0	0	0	0	0
X-ray myelography cervical spine	Usually not appropriate	Expert Consensus	��� 1-10 mSv		1	n/a	0	0	0	0	0	0	0	0	0
MRA neck without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
MRA neck with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0
MRI cervical spine with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	n/a	0	0	0	0	0	0	0	0	0

References	Study Quality
23 (9460946)	2
22 (26571180)	3

Variant 8: Chronic cervical or neck pain. No neurologic findings. Radiographs show degenerative changes. Next imaging study.

Procedure	Appropriateness	gor.	A L L DDI	D 1 DD1	D (1	3.6.31			F	inal '	Гаbu	latio	ns		
	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]	8	8	0	0	0	1	0	2	3	6	6

References		Study	Quality	
115 (27492725)	)		4	
114 (28139306)			4	
113 (21269888)	1		4	
112 (19333104)			3	
111 (10947922)			4	
23 (9460946)			2	
22 (26571180)			3	
21 (8107998)			3	
20 (25430861)		·	4	

CT cervical spine without IV contrast	May be appropriate	Limited	Limited		���� 3- 10 mSv [ped]	6	6	0	0	2	0	3	7	3	4	0
		References			Study Quality					•	•	•	•			
		24 (17379279)			Inac											
CT myelography cervical spine	May be appropriate	Expert Consensus	Expert		��� 0.3- 3 mSv [ped]	4	4	5	1	1	5	4	1	1	0	0
MRI cervical spine without and with IV contrast	Usually not appropriate	Strong	Strong O 0 mSv		O 0 mSv [ped]	3	3	3	3	6	2	4	0	1	0	0
		References			Study	Quality										
		115 (27492725			4											
		114 (28139306		4												
		113 (21269888														
		112 (19333104	3													
		111 (10947922			4											
		23 (9460946)				2										
		22 (26571180)				3										
		21 (8107998)				3										
		20 (25430861)							1							
Tc-99m bone scan whole body with SPECT/CT neck	Usually not appropriate	Limited	���� 10- mSv	30		3	3	5	1	7	4	1	1	0	0	0
		References			Study	Quality		-								
		106 (19643679	)			4										
		26 (23412368)				3										
MRI cervical spine with IV contrast	Usually not appropriate	Strong	O 0 mSv	/	O 0 mSv [ped]	2	2	8	3	5	2	0	1	0	0	0
		References			Study	Quality		<u> </u>								
		23 (9460946)				2										
		22 (26571180)				3										
		21 (8107998)				3										
		20 (25430861)				4										

	_																
			114 (28139306)	)			4										
			113 (21269888)	)			4										
			112 (19333104)	)													
			111 (10947922)	)													
		115 (27492725)															
CTA neck with IV contrast	Usually appropr		Expert Consensus	��� 1-10 mSv	0	��� 0.3- 3 mSv [ped]	1	1	10	3	2	2	1	0	0	0	0
CT cervical spine with IV contrast	Usually appropr		Limited	��� 1-10 mSv	0	���� 3- 10 mSv [ped]	1	1	11	2	1	2	2	0	0	0	0
			References			Study	y Quality										
			24 (17379279)			Inac	dequate										
CT cervical spine without and with IV contrast	Usually appropr		Limited	��� 1-10 mSv	0	���� 3- 10 mSv [ped]	1	1	11	2	1	3	1	0	0	0	0
			References			Study	y Quality										
			24 (17379279)														
Discography cervical spine	Usually appropr		Limited	�� 0.1-1m	ıSv		1	1	11	4	2	1	0	0	0	0	0
			References		Study Quality												
			1 (18204385)				4										
Facet injection/medial branch block cervical spine	Usually appropr		Limited	�� 0.1-1m	ıSv		1	1	10	2	2	2	1	1	0	0	0
			References			Study	y Quality										
			110 (15168223)	)			4										
			109 (18295649)	)			4										
X-ray myelography cervical spine	Usually appropr		Limited	��� 1-10 mSv	0		1	1	10	1	1	4	2	0	0	0	0
			References			Study	y Quality										
		116 (5643913)					4										

MRA neck without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	3	4	0	1	0	0	0	0
MRA neck with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	3	4	0	1	0	0	0	0

Variant 9: Chronic cervical or neck pain without or with radiculopathy. Radiographs show ossification in the posterior longitudinal ligament (OPLL). Next imaging study.

Duran Jama	Appropria	teness	SOF	A J14., DDI	D. 1	DDI	D - 43	M - 3!			F	inal	Tabu	latio	ns		
Procedure	Catego		SOE	Adults RRI	L Peds 1	KKL	Rating	Median	1	2	3	4	5	6	7	8	9
CT cervical spine without IV contrast	Usuall appropri			��� 1-10 mSv	)	nSv	8	8	1	0	0	1	2	1	2	5	6
		References		Study Quality													
			120 (23179977)				4		_								
CT myelography cervical spine	May b appropri (Disagreer	iate	Expert Opinion	<b>≎≎≎≎</b> 10-3 mSv	30	าริง	5	5	0	1	3	4	4	3	2	1	1
			References		Study Quality												
			121 (24153172)				3		_				_				
MRI cervical spine without IV contrast	May b appropri (Disagreer	iate	Expert Opinion	O 0 mSv	O 0 r [pe		5	7	0	1	1	1	1	2	8	4	1
			References		•	Study	Quality										
			122 (1636514)			3											
X-ray myelography cervical spine	Usually appropri		Limited	��� 1-10 mSv	)		2	2	9	0	5	3	1	0	0	0	0
			References			Study	Quality										
			17 (-3130497)				4										
MRI cervical spine without and with IV contrast	Usually appropri		Limited	O 0 mSv	O 0 r [pe		2	2	8	2	1	3	3	0	1	0	0
			References			Study	Quality										
			122 (1636514)				3										

CTA neck with IV contrast	Usually appropr	Expert Consensus	ert		��� 0.3- 3 mSv [ped]	1	1	12	1	2	2	1	0	0	0	0
CT cervical spine with IV contrast	Usually appropr	Limited	<b>≎≎≎</b> 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	11	2	2	1	0	2	0	0	0
		References			Study	Quality										
		120 (23179977)				4										
CT cervical spine without and with IV contrast	Usually appropr	Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	11	1	2	2	2	0	0	0	0
		References														
		120 (23179977)			Study Quality  4											
Discography cervical spine	Usually appropr	Expert Consensus	�� 0.1-1n	nSv		1	1	15	2	1	0	0	0	0	0	0
Facet injection/medial branch block cervical spine	Usually appropr	Expert Consensus	�� 0.1-1n	nSv		1	1	15	2	1	0	0	0	0	0	0
MRA neck without IV contrast	Usually appropr	Expert Consensus	O 0 mS\	٧	O 0 mSv [ped]	1	1	12	2	3	0	1	0	0	0	0
MRA neck with IV contrast	Usually appropr	Expert Consensus	O 0 mS\	٧	O 0 mSv [ped]	1	1	12	2	3	0	1	0	0	0	0
MRI cervical spine with IV contrast	Usually appropr	Limited	O 0 mSv		O 0 mSv [ped]	1	1	10	2	2	1	2	1	0	0	0
		References		Stu		Quality										
		122 (1636514)				3										
Tc-99m bone scan whole body with SPECT/CT neck	Usually appropr	Expert Consensus	���� 10-30 mSv			1	1	13	2	2	1	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.