American College of Radiology ACR Appropriateness Criteria[®]

Low Back Pain

Variant 1: Acute low back pain with or without radiculopathy. No red flags. No prior management. Initial imaging.

	Appropri	iateness	207		-						F	'inal '	Tabu	latio	ns		
Procedure	Categ	gory	SOE	Adults RR	RL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Discography and post-discography CT lumbar spine	Usuall approp		Expert Consensus	ତ®ତ 1-1(mSv	0		1	1	17	1	2	0	0	0	0	0	0
CT myelography lumbar spine	Usuall approp		Expert Consensus	ଡଡଡଡ 10-3 mSv	30		1	1	16	1	1	0	2	0	0	0	0
CT lumbar spine with IV contrast	Usuall approp		Expert Consensus	ଝେଡେଡ 1-1(mSv	0	≎≎≎≎ 3- 10 mSv [ped]	1	1	14	2	3	1	0	0	0	0	0
CT lumbar spine without IV contrast	Usuall approp		Strong	େଡେଡ 1-1(mSv	0	€€€€ 3- 10 mSv [ped]	1	1	11	3	2	1	2	1	0	0	0
			References			Study	v Quality										
			4 (21282698)				4										
			6 (12783911)				1										
			7 (16244269)				1										
			9 (25781443)				3										
			17 (23910019)				2		_				-			-	
CT lumbar spine without and with IV contrast	Usuall approp		Expert Consensus	ଝେଡେଡେ 10∹ mSv	30	���� 3- 10 mSv [ped]	1	1	16	3	1	0	0	0	0	0	0
MRI lumbar spine without IV contrast	Usuall approp		Strong	O 0 mSv	/	O 0 mSv [ped]	1	1	16	4	2	0	0	0	0	0	0
			References			Study	v Quality										

		4 (21282698)			4										
		6 (12783911)			1										
		7 (16244269)			1										
		9 (25781443)			3										
		17 (23910019)			2										
MRI lumbar spine without and with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	14	2	2	0	0	0	2	0	0
		References		Study	y Quality										
		4 (21282698)			4										
		6 (12783911)			1										
		7 (16244269)			1										
		9 (25781443)			3										
		17 (23910019)			2										
Bone scan whole body with SPECT or SPECT/CT complete spine	Usually not appropriate	Expert Consensus	ତତତ 1-10 mSv	ହହହହ 3- 10 mSv [ped]	1	1	18	1	1	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	ଡଡଡଡ 10-30 mSv)	1	1	18	1	1	0	0	0	0	0	0
Radiography lumbar spine	Usually not appropriate	Strong	ଷଷଷ 1-10 mSv	�� 0.03- 0.3 mSv [ped]	1	1	15	2	4	1	0	0	0	0	0
		References		Study	Quality										
		4 (21282698)			4										
		6 (12783911)			1										
		7 (16244269)			1										
		9 (25781443)			3										
		17 (23910019)			2										
MRI lumbar spine with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	17	0	2	0	0	0	1	0	0

Variant 2: Subacute or chronic low back pain with or without radiculopathy. No red flags. No prior management. Initial imaging.

	Appropri	iateness			-	D 1 DD1					F	inal	Tabu	latio	ıs		
Procedure	Categ		SOE	Adults RR	ar	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Discography and post-discography CT lumbar spine	Usuall approp		Expert Consensus	ଡଡଡ 1-1 mSv	0		1	1	17	0	3	0	0	0	0	0	0
CT myelography lumbar spine	Usuall approp		Expert Consensus	ଡେଡେଡେ 10- mSv	-30		1	1	15	1	1	0	3	0	0	0	0
CT lumbar spine with IV contrast	Usuall _{approp}		Expert Consensus	ତତତ 1-1 mSv	0	≎≎≎≎≎ 3- 10 mSv [ped]	1	1	15	2	2	1	0	0	0	0	0
CT lumbar spine without IV contrast	Usuall: approp		Strong	ବରତ 1-1 mSv	0	€€€€ 3- 10 mSv [ped]	1	1	11	3	2	0	2	2	0	0	0
			References			Study	Quality						•				
			4 (21282698)				4										
			6 (12783911)				1										
			7 (16244269)				1										
			9 (25781443)				3										
			17 (23910019)				2					_		-	-	-	
CT lumbar spine without and with IV contrast	Usuall approp		Expert Consensus	ତତତତ 10- mSv	-30	֎֎֎֎ 3- 10 mSv [ped]	1	1	17	1	1	1	0	0	0	0	0
MRI lumbar spine without IV contrast	Usuall approp		Strong	O 0 mSv	/	O 0 mSv [ped]	1	1	13	5	1	3	0	0	0	0	0
			References			Study	V Quality										
			4 (21282698)				4										
			6 (12783911)				1										
			7 (16244269)				1										
			9 (25781443)				3										
			17 (23910019)				2					_	-	-	-		
MRI lumbar spine without and with IV contrast	Usuall approp		Strong	O 0 mSv	/	O 0 mSv [ped]	1	1	13	3	2	0	0	1	0	1	0

		References		Study	Quality										
		4 (21282698)		Study	<u>Quanty</u> 4										
		6 (12783911)			1										
					1										
		7 (16244269)			1										
		9 (25781443)			3										
		17 (23910019)			2	<u> </u>			1	1		1			
Bone scan whole body with SPECT or SPECT/CT complete spine	Usuall approp	Expert Consensus	ତଟେତ 1-10 mSv	ବ୍ୟବହ୍ୟ 3- 10 mSv [ped]	1	1	15	4	1	0	0	0	0	0	0
FDG-PET/CT whole body	Usuall ₂ approp	Expert Consensus	ତତତତ 10-30 mSv	ଡେଡଡଡ 3- 10 mSv [ped]	1	1	18	1	1	0	0	0	0	0	0
Radiography lumbar spine	Usuall ₂ approp	Strong	ତେତେ 1-10 mSv	�� 0.03- 0.3 mSv [ped]	1	1	12	4	2	2	2	0	0	0	0
		References		Study	Quality										
		4 (21282698)			4										
		6 (12783911)			1										
		7 (16244269)			1										
		9 (25781443)			3										
		17 (23910019)			2										
MRI lumbar spine with IV contrast	Usuall ₂ approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	1	3	0	0	1	0	0	0

Variant 3: Subacute or chronic low back pain with or without radiculopathy. Surgery or intervention candidate with persistent or progressive symptoms during or following 6 weeks of optimal medical management. Initial imaging.

Der er herre	Appropri	ateness	SOF	A .]]4 D.D.	.т.	D. J. DDI	Dettere	Maltan			F	'inal '	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RR	al I	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI lumbar spine without IV contrast	Usua approp		Strong	O 0 mSv	/	O 0 mSv [ped]	9	9	0	0	0	0	1	0	1	8	10
			References			Study	Quality										

				i												
			7 (16244269)			1										
			13 (17088193)			3										
			35 (23136176)			3										
			34 (24637890)			1										
CT myelography lumbar spine	May be appropria		Limited	ତତତତ 10-30 mSv		5	5	0	0	0	5	14	2	1	0	0
			References		Study	Quality			•							
			22 (12637281)		*	3										
			23 (23592868)			4										
CT lumbar spine without IV contrast	May be appropris		Strong	ତେତେ 1-10 mSv	≎≎≎≎≎ 3- 10 mSv [ped]	5	5	0	0	1	1	17	3	0	0	0
			References		Study	Quality										
			27 (27789449)			2										
			26 (28478246)			2										
MRI lumbar spine without and with IV contrast	May be appropria		Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	1	1	0	3	15	2	0	0	0
Radiography lumbar spine	May be appropria		Strong	ଝେଝଝ 1-10 mSv	�� 0.03- 0.3 mSv [ped]	5	5	0	1	1	5	9	3	1	0	2
			References		Study	Quality										
			27 (27789449)			2										
			25 (27997505)			2										
			36 (15851040)			4										
			24 (29432395)		_	4						-				
Bone scan whole body with SPECT or SPECT/CT complete spine	May be appropria		Strong	≎≎≎≎ 1-10 mSv	&&&& 3- 10 mSv [ped]	4	4	6	1	3	5	5	0	0	0	0
			References		Study	Quality										
			31 (27387155)			4										
		29 (28847557)				2										
			30 (28377243)			2										
			28 (26550787)			2										

Discography and post-discography CT lumbar spine	Usuall approp		Limited	ଝେଡ 1-1(mSv)	3	3	6	1	5	4	2	2	0	0	0
			References		Study	V Quality										
			32 (23615887)			4										
MRI lumbar spine with IV contrast	Usuall approp		Limited	O 0 mSv	O 0 mSv [ped]	3	3	6	3	5	2	3	0	0	1	0
			References		Study	V Quality										
			33 (16699849)			4			-		-		-			
CT lumbar spine with IV contrast	Usuall approp		Expert Consensus	ଝେଝେ 1-1(mSv)	1	1	11	2	5	0	1	1	0	0	0
CT lumbar spine without and with IV contrast	Usuall approp		Expert Consensus	ତତତତ 10∹ mSv	30	1	1	13	3	1	2	1	0	0	0	0
FDG-PET/CT whole body	Usuall approp		Strong	ତତତତ 10∹ mSv	30	1	1	16	3	1	0	0	0	0	0	0
			References		Study	v Quality										
			29 (28847557)			2										
		30 (28377243)				2										
			28 (26550787)			2										

Variant 4: Low back pain with suspected cauda equina syndrome. Initial imaging.

Durandana	Appropriateness	SOF			Deffere	Maltan			F	Final	Tabı	ilatio	ons		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI lumbar spine without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	0	0	1	0	4	14
		References		Study	v Quality										
		41 (17453789)			3										
		42 (28385420)			4										

MRI lumbar spine without and with IV contrast	Usually appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	7	7	1	0	1	0	2	1	12	4	1
CT myelography lumbar spine	May be appropriate	Limited	ଷଷଷଷ 10-30 mSv		5	5	0	0	1	2	14	4	1	0	0
		References		Study	y Quality										
		22 (12637281)		-	3										
CT lumbar spine without IV contrast	May be appropriate	Limited	ତତତ 1-10 mSv	≎≎≎≎ 3- 10 mSv [ped]	5	5	2	0	0	3	7	6	1	0	1
		References		Study	y Quality										
		27 (27789449)			2										
MRI lumbar spine with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	4	3	6	3	2	0	1	1	0
		References		Study	y Quality										
		33 (16699849)		-	4										
Discography and post-discography CT lumbar spine	Usually not appropriate	Expert Consensus	ଝେଝ 1-10 mSv		1	1	16	3	1	0	0	0	0	0	0
CT lumbar spine with IV contrast	Usually not appropriate	Expert Consensus	ତତତ 1-10 mSv	≎≎≎≎ 3- 10 mSv [ped]	1	1	11	2	4	2	1	0	0	0	0
CT lumbar spine without and with IV contrast	Usually not appropriate	Expert Consensus	ବ୍ୟବ୍ୟକ 10-30 mSv	&&&& 3- 10 mSv [ped]	1	1	13	2	3	0	2	0	0	0	0
Bone scan whole body with SPECT or SPECT/CT complete spine	Usually not appropriate	Expert Consensus	ଡେଡେ 1-10 mSv	&&&& 3- 10 mSv [ped]	1	1	16	2	2	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	ଷଷଷତ 10-30 mSv	ଡଡଡଡ 3- 10 mSv [ped]	1	1	17	2	1	0	0	0	0	0	0
Radiography lumbar spine	Usually not appropriate	Expert Consensus	ଝେଝ 1-10 mSv	≎≎ 0.03- 0.3 mSv [ped]	1	1	18	0	1	0	1	1	1	0	0

Variant 5: Low back pain with history of prior lumbar surgery and with or without radiculopathy. New or progressing symptoms or clinical findings. Initial imaging.

	Appropria	ateness	<i></i>							F	'inal '	Tabu	latio	ns		
Procedure	Catego		SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI lumbar spine without and with IV contrast	Usual appropr		Limited	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	0	0	0	2	5	12
			References		Study	/ Quality					•					
			43 (3258108)			2										
MRI lumbar spine without IV contrast	Usual appropr		Limited	O 0 mSv	O 0 mSv [ped]	7	7	1	0	0	0	3	4	3	7	2
			References		Study	/ Quality						•	-	-		
			43 (3258108)			2										
Radiography lumbar spine	Usual appropr		Limited	ଝେଝ 1-10 mSv	&≎ 0.03- 0.3 mSv [ped]	7	7	0	0	0	0	3	2	11	5	1
			References		Study	/ Quality										
			50 (32405554)			4										
CT lumbar spine without IV contrast	May b appropr		Limited	֎֎֎ 1-10 mSv	- 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6	6	1	0	0	0	5	5	5	2	2
			References		Study	/ Quality										
			44 (22733920)			4										
			27 (27789449)			2					_		-			
CT myelography lumbar spine	May b appropr		Strong	ଝଝଝଝ 10-30 mSv)	5	5	1	0	0	2	7	3	6	1	0
			References		Study	/ Quality										<u> </u>
			22 (12637281)			3										
			49 (28634513)			2										
			48 (28881117)			2										
			23 (23592868)			4				1			r	1		
CT lumbar spine with IV contrast	Usually appropr		Limited	ତତତ 1-10 mSv	֎֎֎֎ 3- 10 mSv [ped]	3	3	7	1	4	7	0	1	0	0	0

		References		Study	Quality										
		45 (20568916)			4										
		46 (21961872)			4										
		47 (17093252)			4										
MRI lumbar spine with IV contrast	Usuall approp	Limited	O 0 mSv	O 0 mSv [ped]	2	2	9	2	4	1	2	0	2	0	0
		References		Study	Quality										
		33 (16699849)			4										
Discography and post-discography CT lumbar spine	Usuall approp	Expert Consensus	ଝେଝ 1-10 mSv		1	1	11	2	4	0	2	1	0	0	0
CT lumbar spine without and with IV contrast	Usuall approp	Expert Consensus	ଡଡଡଡ 10-30 mSv	���� 3- 10 mSv [ped]	1	1	11	0	1	6	1	1	0	0	0
Bone scan whole body with SPECT or SPECT/CT complete spine	Usuall approp	Limited	ତେତେ 1-10 mSv	≎≎≎≎≎ 3- 10 mSv [ped]	1	1	12	0	4	3	1	0	0	0	0
		References		Study	y Quality										
		51 (20305409)			3										
		52 (30796507)			4										
		53 (22391701)			4										
		54 (23820764)			4			_							
FDG-PET/CT whole body	Usuall approp	Expert Consensus	ଡଡଡଡ 10-30 mSv	≎≎≎≎ 3- 10 mSv [ped]	1	1	17	2	1	0	0	0	0	0	0

Variant 6: Low back pain with or without radiculopathy. One or more of the following: low-velocity trauma, osteoporosis, elderly individual, or chronic steroid use. Initial imaging.

	Appropriateness	COF							F	'inal '	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI lumbar spine without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	1	0	2	2	5	10

		References			Study											
			58 (12533652)		2											
CT lumbar spine without IV contrast	Usua approp		Limited	ଷଷଷ 1-10 mSv	ଙେଙଙ 3- 10 mSv [ped]	8	8	0	0	0	0	2	1	4	9	4
			References		Study	/ Quality										
			27 (27789449)			2							-		-	
Radiography lumbar spine	Usua approp		Limited	֎֎֎ 1-10 mSv	�� 0.03- 0.3 mSv [ped]	8	8	0	0	1	0	0	2	5	6	6
			References		Study	Quality										
			55 (12353946)			4										
CT myelography lumbar spine	May approp		Limited	ତତତତ 10-30 mSv		5	5	0	0	1	4	15	1	1	0	0
		References			Study		-									
			22 (12637281)			3							-			
MRI lumbar spine without and with IV contrast	May approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	0	5	3	12	2	0	0	0
Bone scan whole body with SPECT or SPECT/CT complete spine	Usuall approp		Limited	ଡେଡଡ 1-10 mSv	≎≎≎≎ 3- 10 mSv [ped]	3	3	8	1	5	1	3	1	1	0	0
			References		Study Quality											
			59 (18349795)			2				-						
Discography and post-discography CT lumbar spine	Usuall approp		Expert Consensus	ଡେଡେ 1-10 mSv		1	1	16	2	1	1	0	0	0	0	0
CT lumbar spine with IV contrast	Usually not Expert appropriate Consensus			ବ୍ୟବ୍ତ 1-10 mSv	≎≎≎≎≎ 3- 10 mSv [ped]	1	1	12	3	3	2	0	0	0	0	0
CT lumbar spine without and with IV contrast	Usually not appropriate		Expert Consensus	ଡଡ ଡଡ 10-30 mSv	€€€€€ 3- 10 mSv [ped]	1	1	15	2	1	1	1	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate Limited		ଡଡଡଡ 10-30 mSv	ଙଙଙଙ 3- 10 mSv [ped]	1	1	12	3	2	1	1	0	1	0	0	

		References															
		60 (21214309)															
MRI lumbar spine with IV contrast	Usuall approp		Limited	O 0 mSv	,	O 0 mSv [ped]	1	1	11	1	4	1	3	0	0	0	0
			References		Study Quality												
			33 (16699849)			4											

Variant 7: Low back pain with or without radiculopathy. One or more of the following: suspicion of cancer, infection, or immunosuppression. Initial imaging.

	Appropriate	eness	SOE		-	L Peds RRL			Final Tabulations												
Procedure	Category	y		Adults RR	L		Rating	Median	1	2	3	4	5	6	7	8	9				
MRI lumbar spine without and with IV contrast	Usually appropria	ite	Limited	O 0 mSv	,	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	6	13				
			References			Study	Quality														
			65 (18278491)		3																
			62 (22312523)				4														
			67 (19325068)		4											•					
MRI lumbar spine without IV contrast	Usually appropria		Limited	O 0 mSv	,	O 0 mSv [ped]	7	7	0	0	0	0	2	2	7	5	4				
		References																			
			62 (22312523)							-											
CT myelography lumbar spine	May be appropria		Limited	େତେତେତ 10∹ mSv	30		5	5	0	0	0	9	11	2	0	0	0				
			References																		
			22 (12637281)		Study Quality 3						-				-						
CT lumbar spine with IV contrast	May be appropria		Limited	ଝେଝ 1-1(mSv	D	ତେତେତ 3- 10 mSv [ped]	5	5	1	0	2	1	16	2	0	0	0				
		References																			
		45 (20568916)		4																	
		46 (21961872)																			

		47 (17093252)													
CT lumbar spine without IV contrast	May be appropriate	Limited	େଡେଡ 1-10 mSv	≎≎≎≎ 3- 10 mSv [ped]	5	5	0	0	1	3	12	5	1	0	0
		References		Study	y Quality										
		45 (20568916)			4										
		46 (21961872)			4										
		47 (17093252)			4			-			-				
Radiography lumbar spine	May be appropriate (Disagreement)	Expert Opinion	ଝଝଝ 1-10 mSv	�� 0.03- 0.3 mSv [ped]	5	5	6	7	4	1	1	1	1	0	1
		References		Study											
		70 (16951929)													
		64 (6023348)													
		69 (10964746)													
CT lumbar spine without and with IV contrast	Usually not appropriate	Expert Consensus	ହତତତ 10-30 mSv	ଡଡଡଡ 3- 10 mSv [ped]	3	3	9	1	3	3	2	0	2	0	0
Bone scan whole body with SPECT or SPECT/CT complete spine	Usually not appropriate	Expert Consensus	ଡେଡେ 1-10 mSv	∞∞∞∞ 3- 10 mSv [ped]	3	3	5	5	10	1	1	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate	Limited	ତତତତ 10-30 mSv	ଚ୍ଚଚ୍ଚଚ୍ଚ 3- 10 mSv [ped]	3	3	3	8	5	4	2	0	0	0	0
		References		Study											
		65 (18278491)													
		66 (30050321)			2					-					
MRI lumbar spine with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	10	5	6	1	0	0	0	0	0
		References		Study											
		33 (16699849)						-		-					
Discography and post-discography CT lumbar spine	Usually not appropriate	Expert Consensus	ଝେଝ 1-10 mSv		1	1	15	3	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.