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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Discography and post-discography CT lumbar spine	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	17	1	2	0	0	0	0	0	0
CT myelography lumbar spine	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv		1	1	16	1	1	0	2	0	0	0	0
CT lumbar spine with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	14	2	3	1	0	0	0	0	0
CT lumbar spine without IV contrast	Usually not appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	11	3	2	1	2	1	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	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	16	3	1	0	0	0	0	0	0
MRI lumbar spine without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	16	4	2	0	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 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 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	☢☢☢ 1-10 mSv	☢☢☢☢ 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	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	18	1	1	0	0	0	0	0	0
Radiography lumbar spine	Usually not appropriate	Strong	☢☢☢ 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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Discography and post-discography CT lumbar spine	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	17	0	3	0	0	0	0	0	0
CT myelography lumbar spine	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv		1	1	15	1	1	0	3	0	0	0	0
CT lumbar spine with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	15	2	2	1	0	0	0	0	0
CT lumbar spine without IV contrast	Usually not appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 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	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	17	1	1	1	0	0	0	0	0
MRI lumbar spine without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	13	5	1	3	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 without and with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	13	3	2	0	0	1	0	1	0

References	Study 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	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	15	4	1	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	18	1	1	0	0	0	0	0	0
Radiography lumbar spine	Usually not appropriate	Strong	☢☢☢ 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	Usually not appropriate	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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI lumbar spine without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	1	0	1	8	10

References	Study Quality

		7 (16244269)		1											
		13 (17088193)		3											
		35 (23136176)		3											
		34 (24637890)		1											
CT myelography lumbar spine	May be appropriate	Limited	☢☢☢☢ 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 appropriate	Strong	☢☢☢ 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 appropriate	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 appropriate	Strong	☢☢☢ 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 appropriate	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	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		3	3	6	1	5	4	2	2	0	0	0
	References		Study Quality												
	32 (23615887)		4												
MRI lumbar spine with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	6	3	5	2	3	0	0	1	0
	References		Study Quality												
	33 (16699849)		4												
CT lumbar spine with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	11	2	5	0	1	1	0	0	0
CT lumbar spine without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	13	3	1	2	1	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	16	3	1	0	0	0	0	0	0
	References		Study Quality												
	29 (28847557)		2												
	30 (28377243)		2												
	28 (26550787)		2												

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

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							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 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	☢☢☢☢ 10-30 mSv		5	5	0	0	1	2	14	4	1	0	0
	References		Study Quality												
	22 (12637281)		3												
CT lumbar spine without IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	2	0	0	3	7	6	1	0	1
	References		Study 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 Quality												
	33 (16699849)		4												
Discography and post-discography CT lumbar spine	Usually not appropriate	Expert Consensus	☢☢☢ 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	☢☢☢ 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	☢☢☢☢ 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	☢☢☢ 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	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	17	2	1	0	0	0	0	0	0
Radiography lumbar spine	Usually not appropriate	Expert Consensus	☢☢☢ 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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI lumbar spine without and with IV contrast	Usually appropriate	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	Usually appropriate	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	Usually appropriate	Limited	☢☢☢ 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 be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	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 be appropriate	Strong	☢☢☢☢ 10-30 mSv		5	5	1	0	0	2	7	3	6	1	0
	References		Study Quality												
	22 (12637281)		3												
	49 (28634513)		2												
	48 (28881117)		2												
	23 (23592868)		4												
CT lumbar spine with IV contrast	Usually not appropriate	Limited	☢☢☢ 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	Usually not appropriate	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	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	11	2	4	0	2	1	0	0	0
CT lumbar spine without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 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	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	0	4	3	1	0	0	0	0
		References		Study Quality												
		51 (20305409)		3												
		52 (30796507)		4												
		53 (22391701)		4												
		54 (23820764)		4												
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	☢☢☢☢ 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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							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 Quality												
		58 (12533652)		2												
CT lumbar spine without IV contrast	Usually appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	0	0	0	2	1	4	9	4
		References		Study Quality												
		27 (27789449)		2												
Radiography lumbar spine	Usually appropriate	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 be appropriate	Limited	☢☢☢☢ 10-30 mSv		5	5	0	0	1	4	15	1	1	0	0
		References		Study Quality												
		22 (12637281)		3												
MRI lumbar spine without and with IV contrast	May be appropriate	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	Usually not appropriate	Limited	☢☢☢ 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	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	16	2	1	1	0	0	0	0	0
CT lumbar spine with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 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	☢☢☢☢ 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	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	3	2	1	1	0	1	0	0

		References		Study Quality											
		60 (21214309)		2											
MRI lumbar spine with IV contrast	Usually not appropriate	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.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI lumbar spine without and with IV contrast	Usually appropriate	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 appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	2	2	7	5	4
		References		Study Quality											
		62 (22312523)		4											
CT myelography lumbar spine	May be appropriate	Limited	☢☢☢☢ 10-30 mSv		5	5	0	0	0	9	11	2	0	0	0
		References		Study Quality											
		22 (12637281)		3											
CT lumbar spine with IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	1	0	2	1	16	2	0	0	0
		References		Study Quality											
		45 (20568916)		4											
		46 (21961872)		4											

		47 (17093252)		4												
CT lumbar spine without IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	1	3	12	5	1	0	0
		References		Study Quality												
		45 (20568916)		4												
		46 (21961872)		4												
		47 (17093252)		4												
Radiography lumbar spine	May be appropriate (Disagreement)	Expert Opinion	☢☢☢ 1-10 mSv	☢☢ 0.03-0.3 mSv [ped]	5	5	6	7	4	1	1	1	1	0	1
		References		Study Quality												
		70 (16951929)		2												
		64 (6023348)		4												
		69 (10964746)		4												
CT lumbar spine without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 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	☢☢☢ 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	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	3	8	5	4	2	0	0	0	0
		References		Study Quality												
		65 (18278491)		3												
		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 Quality												
		33 (16699849)		4												
Discography and post-discography CT lumbar spine	Usually not appropriate	Expert Consensus	☢☢☢ 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.**