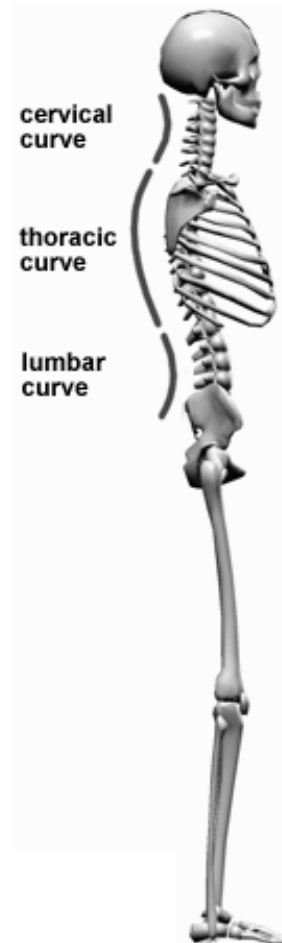


Guides to the Impairment Rating of the Lumbar Spine

5th Edition

By

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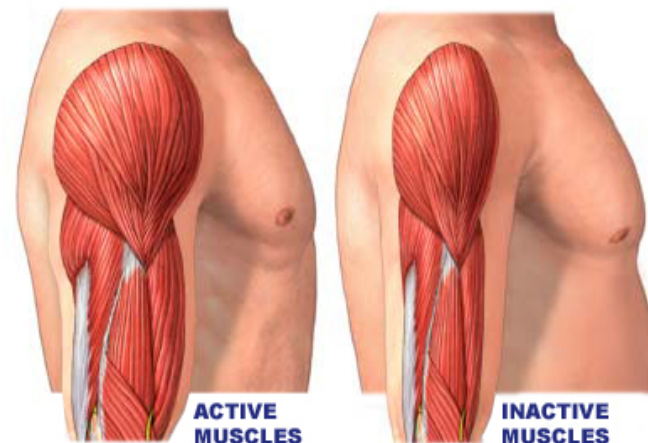
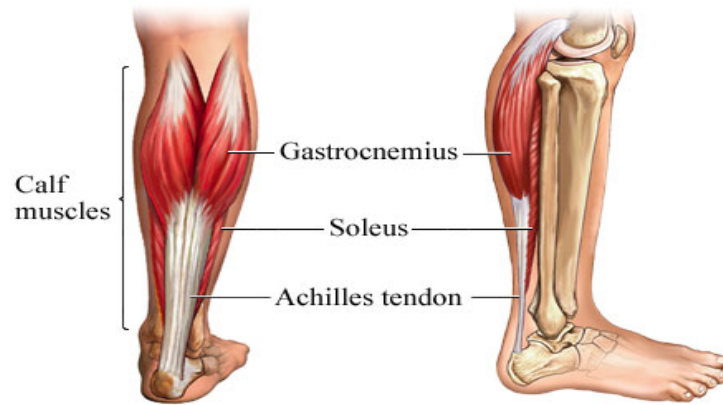
Definition of Terms:

- Muscle Spasm/Muscle Guarding
- Asymmetric Range of Motion
- Nonverifiable Radicular Root Pain
- Reflexes/Sensory Loss/Atrophy
- EMG/NCV
- Alteration of Motion Segment Integrity



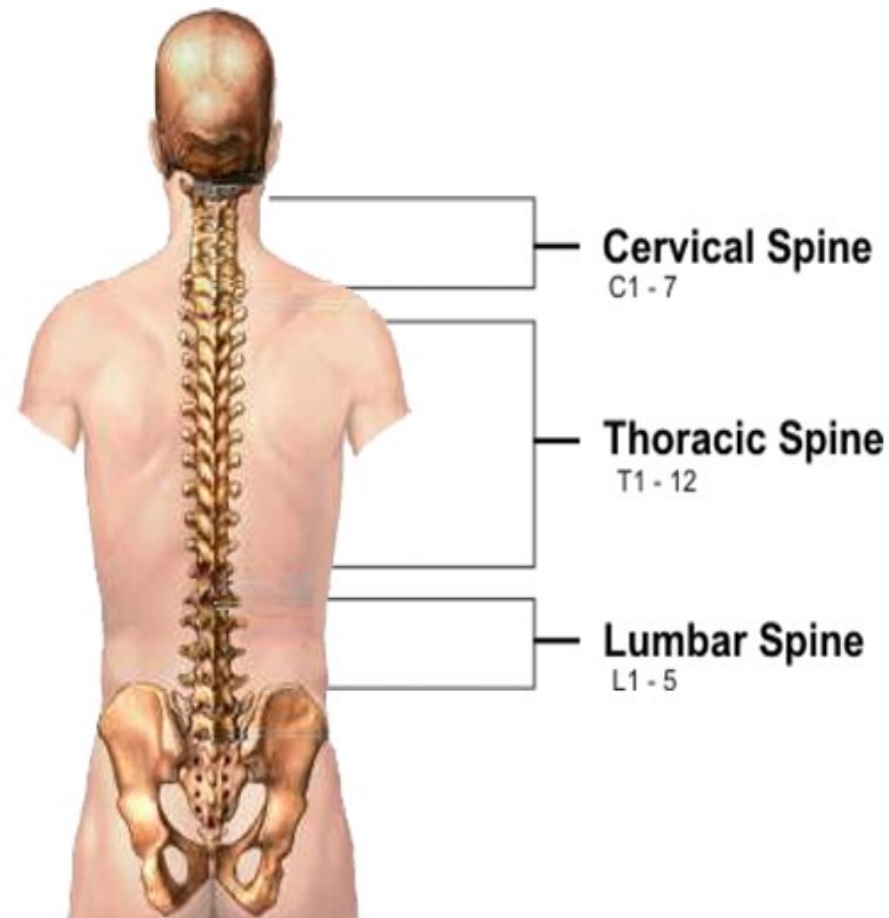
Muscle Spasm/Muscle Guarding

- A. Muscle Spasm is a sudden involuntary contraction of a muscle or a group of muscles. To differentiate true muscle spasm from voluntary muscle contraction, the individual should not be able to relax the contractions. The spasm should be present standing as well as in the supine position and frequently causes a scoliosis.**
- B. Muscle Guarding is a contraction of a muscle to minimize motion or agitation of the injured or diseased tissue. It is not true muscle spasm because the contraction can be relaxed. In the lumbar spine, the contraction frequently results in loss of the normal lumbar lordosis, and it may be associated with reproducible loss of spinal motion.**



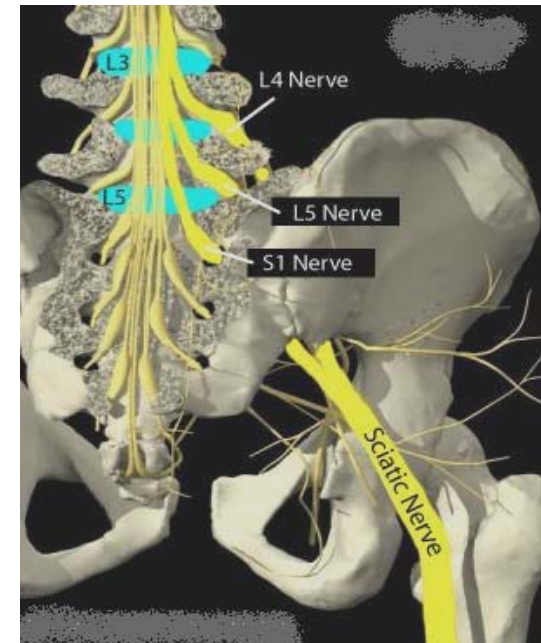
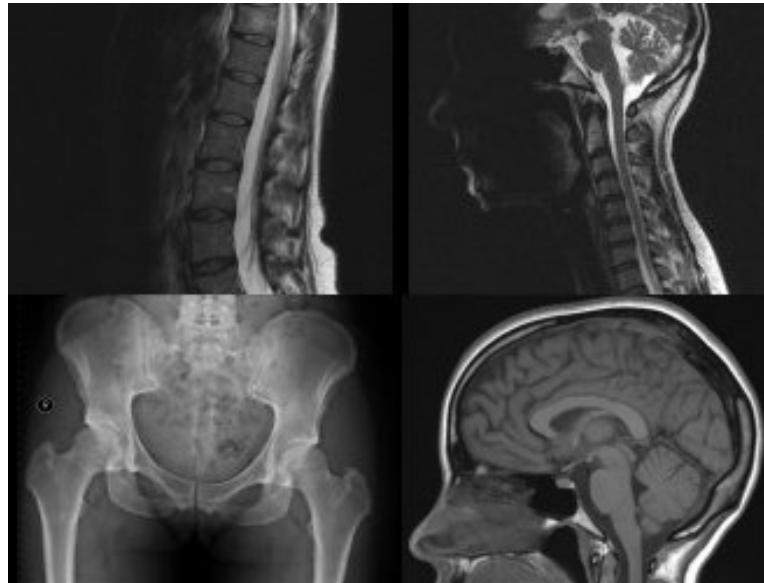
Asymmetric Range of Motion

Asymmetric motion of the spine in one of the three principal planes is sometimes caused by muscle spasm or guarding. If an individual attempts to flex the spine, he or she is unable to do so moving symmetrically; rather, the head or trunk leans to one side. To qualify as true asymmetric motion, the finding must be reproducible and consistent and the examiner must be convinced that the individual is cooperative and giving full effort.



Nonverifiable Radicular Root Pain

Nonverifiable pain is pain that is in the distribution of a nerve root but has no identifiable origin; ie, there are no objective physical, imaging, or electromyographic findings.

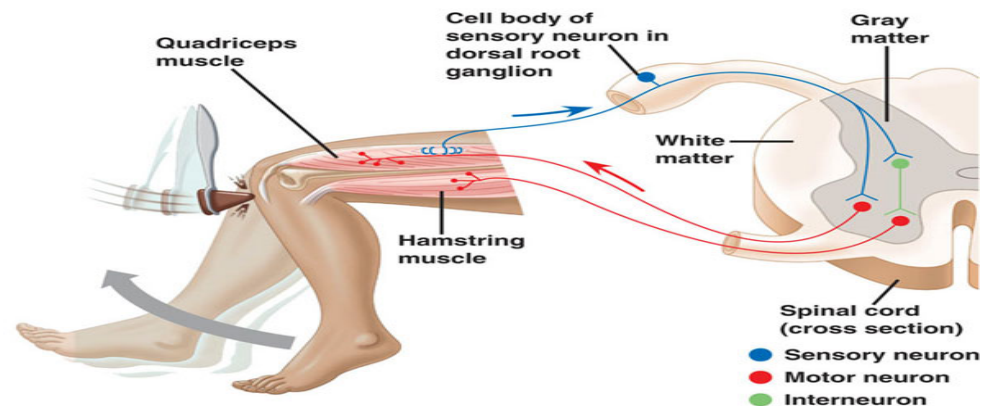


Reflexes/Sensory Loss/Atrophy

For Reflex abnormalities to be considered valid, the involved and normal limb(s) should show marked asymmetry between arms or legs on repeated testing

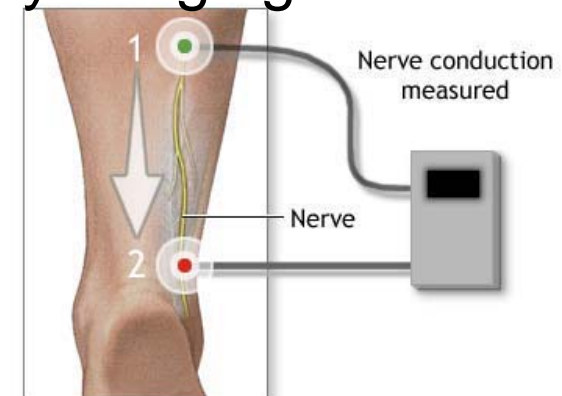
Sensory findings must be in a strict anatomic distribution. Motor finding should be also consistent with the affected nerve structure(s).

Atrophy is measured with a tape measure at identical levels on both limbs. For reasons of reproducibility, the difference in circumference should be 2 cm or greater in the thigh and 1 cm or greater in the arm, forearm, or leg.



EMG/NCV

Unequivocal electrodiagnostic evidence of acute nerve root pathology includes the presence of multiple positive sharp waves or fibrillation potentials in muscles innervated by one nerve root. However, the quality of the person performing and interpreting the study is critical. Electromyography should be performed only by a licensed physician qualified by reason of education, training, and experience in these procedures. Electromyography does not detect all compressive radiculopathies and cannot determine the cause of the nerve root pathology. On the other hand, electromyography can detect noncompressive radiculopathies which are not identified by imaging studies.



Alteration of Motion Segment Integrity

Motion segment alteration can be either loss of motion segment integrity (increased translational or angular motion) or decreased motion secondary to developmental fusion, fracture healing, healed infection, or surgical arthrodesis. An attempt at arthrodesis may not necessarily result in a solid fusion but may significantly limit motion at a motion segment. Motion of the individual spine segments cannot be determined by a physical examination but is evaluated with flexion and extension roentgenograms.

Determining Appropriate Method of Assessment of Impairment:

DRE (diagnosis related estimates) is the principal methodology used to evaluate an individual who has had a distinct *injury*.

Spinal Range of Motion



ROM (range of motion) method is used in several situations:

1. When an impairment is **not** caused by an injury
2. Multi-level involvement in the same spinal region
3. Alteration of motion segment integrity at multiple levels
4. Recurrent radiculopathy caused by a new disk or recurrent disk in the same spinal region

Diagnosis Related Estimates (DRE): Patient at MMI

DRE Lumbar Category I (0% impairment):

DRE Lumbar Category II (5-8% whole person impairment): ADL/Pain above level of impairment

DRE Lumbar Category III (10-13% whole person impairment):

DRE Lumbar Category IV (20-23% whole person impairment)

DRE Lumbar Category V (25-28% impairment)

DRE Lumbar Category I (0% impairment):

No significant clinical findings, no observed muscle guarding or spasm, no documentable neurologic impairment, no documented alteration in structural integrity, and no other indication of impairment related to injury or illness; no fractures

DRE Lumbar Category II (5-8% impairment):

Clinical history and examination findings are compatible with a specific injury; findings may include significant muscle guarding or spasm observed at the time of the examination, asymmetric loss of range of motion, or nonverifiable radicular complaints, defined as complaints of radicular pain without objective findings; no alteration of the structural integrity and no significant radiculopathy

Radiculopathy resolved by conservative treatment

Compression Fracture less than 25% of the vertebral body;

DRE Lumbar Category III (10-13% impairment):

Significant signs of radiculopathy, such as dermatomal pain and/or in a dermatomal distribution, sensory loss, loss of relevant reflex(es), loss of muscle strength or measured unilateral atrophy above or below the knee compared to measurements on the contralateral side at the same location; impairment may be verified by electrodiagnostic findings.

Radiculopathy resolved by surgery, patient is asymptomatic.

Compression Fracture 25-50%

DRE Lumbar Category IV (20-23% impairment):

Loss of motion segment integrity defined from flexion and extension radiographs as at least 4.5 mm of translation of one vertebra on another or angular motion greater than 15 degrees at L1-2, L2-3, and L3-4 greater than 20 degrees at L4-5, and greater than 25 degrees at L5-S1; may have complete or near complete loss of motion of a motion segment due to developmental fusion, or successful or unsuccessful attempt at surgical arthrodesis

Compression Fractures greater than 50%

DRE Lumbar Category V (25-28% impairment):

Meets the criteria of DRE lumbosacral categories III and IV; that is, both radiculopathy and alteration of motion segment integrity are present; significant lower extremity impairment is present as indicated by atrophy or loss of reflex(es), pain, and/or sensory changes within an anatomic distribution (dermatomal), or electromyographic findings as stated in lumbosacral category III and alteration of spine motion segment integrity as defined in lumbosacral category IV

Compression Fractures greater than 50%

Table 15-3 Criteria for Rating Impairment Due to Lumbar Spine Injury

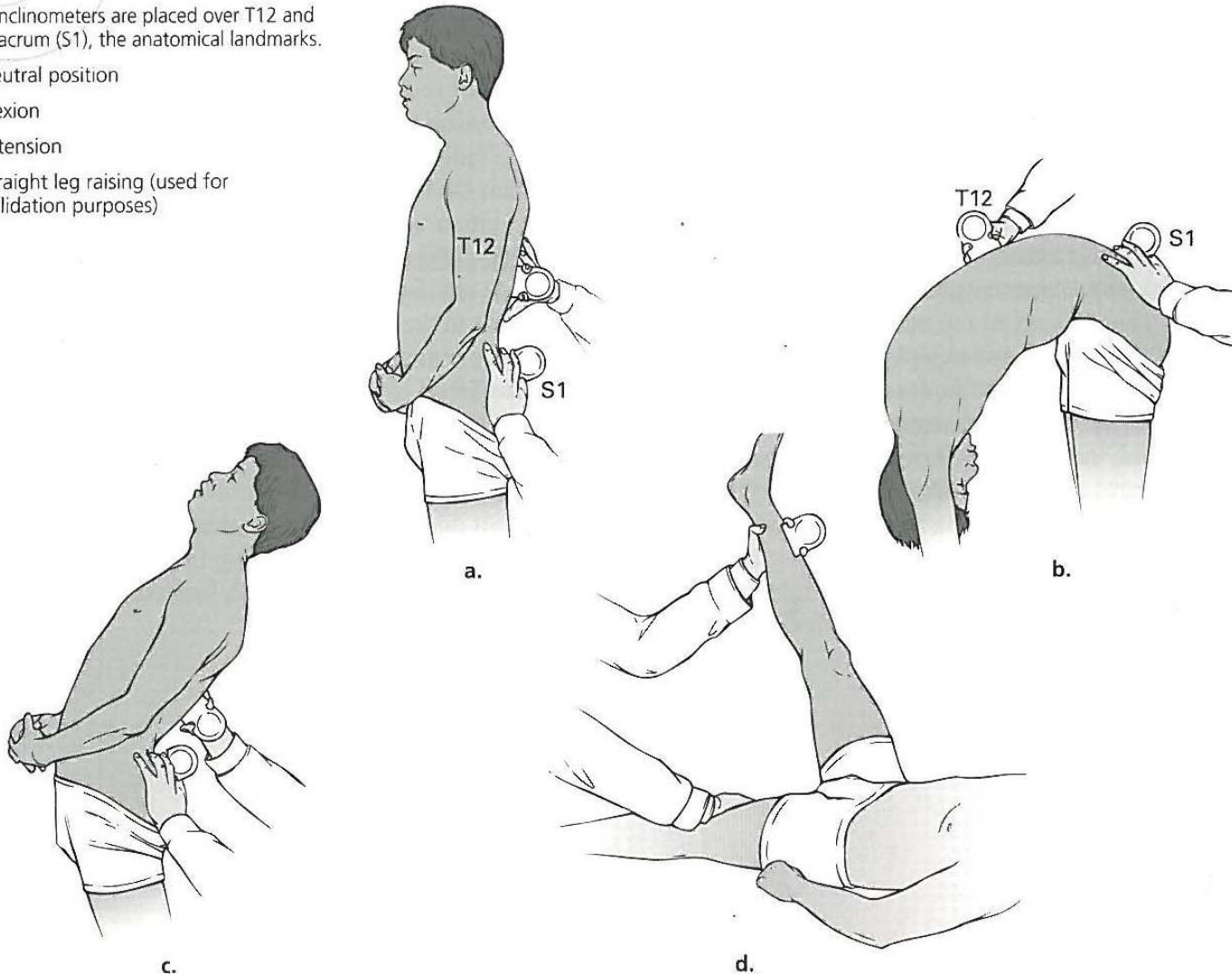
DRE Lumbar Category I 0% Impairment of the Whole Person	DRE Lumbar Category II 5%- 8% Impairment of the Whole Person	DRE Lumbar Category III 10%-13% Impairment of the Whole Person	DRE Lumbar Category IV 20%-23% Impairment of the Whole Person	DRE Lumbar Category V 25%-28% Impairment of the Whole Person
<p>No significant clinical findings, no observed muscle guarding or spasm, no documentable neurologic impairment, no documented alteration in structural integrity, and no other indication of impairment related to injury or illness; no fractures</p>	<p>Clinical history and examination findings are compatible with a specific injury; findings may include significant muscle guarding or spasm observed at the time of the examination, asymmetric loss of range of motion, or nonverifiable radicular complaints, defined as complaints of radicular pain without objective findings; no alteration of the structural integrity and no significant radiculopathy</p> <p>or</p> <p>individual had a clinically significant radiculopathy and has an imaging study that demonstrates a herniated disk at the level and on the side that would be expected based on the previous radiculopathy, but no longer has the radiculopathy following conservative treatment</p> <p>or</p> <p>fractures: (1) less than 25% compression of one vertebral body; (2) posterior element fracture without dislocation (not developmental spondylolysis) that has healed without alteration of motion segment integrity; (3) a spinous or transverse process fracture with displacement without a vertebral body fracture, which does not disrupt the spinal canal</p>	<p>Significant signs of radiculopathy, such as dermatomal pain and/or in a dermatomal distribution, sensory loss, loss of relevant reflex(es), loss of muscle strength or measured unilateral atrophy above or below the knee compared to measurements on the contralateral side at the same location; impairment may be verified by electrodiagnostic findings</p> <p>or</p> <p>history of a herniated disk at the level and on the side that would be expected from objective clinical findings, associated with radiculopathy, or individuals who had surgery for radiculopathy but are now asymptomatic</p> <p>or</p> <p>fractures: (1) 25% to 50% compression of one vertebral body; (2) posterior element fracture with displacement disrupting the spinal canal; in both cases, the fracture has healed without alteration of structural integrity</p>	<p>Loss of motion segment integrity defined from flexion and extension radiographs as at least 4.5 mm of translation of one vertebra on another or angular motion greater than 15° at L1-2, L2-3, and L3-4, greater than 20° at L4-5, and greater than 25° at L5-S1 (Figure 15-3); may have complete or near complete loss of motion of a motion segment due to developmental fusion, or successful or unsuccessful attempt at surgical arthrodesis</p> <p>or</p> <p>fractures: (1) greater than 50% compression of one vertebral body without residual neurologic compromise</p>	<p>Meets the criteria of DRE lumbosacral categories III and IV; that is, both radiculopathy and alteration of motion segment integrity are present; significant lower extremity impairment is present as indicated by atrophy or loss of reflex(es), pain, and/or sensory changes within an anatomic distribution (dermatomal), or electromyographic findings as stated in lumbosacral category III and alteration of spine motion segment integrity as defined in lumbosacral category IV</p> <p>or</p> <p>fractures: (1) greater than 50% compression of one vertebral body with unilateral neurologic compromise</p>

ROM Method: Use of Inclinometers

Figure 15-8 Two-Inclinometer Technique for Measuring Lumbar Flexion and Extension

The inclinometers are placed over T12 and the sacrum (S1), the anatomical landmarks.

- a. neutral position
- b. flexion
- c. extension
- d. straight leg raising (used for validation purposes)



Specific Spine Disorders

Disorder	% Impairment of the Whole Person		
	Cervical	Thoracic	Lumbar
I. Fractures			
A. Compression of one vertebral body.			
0%-25%	4	2	5
26%-50%	6	3	7
> 50%	10	5	12
B. Fracture of posterior element (pedicle, lamina, articular process, transverse process).	4	2	5
<i>Note: An impairment due to compression of a vertebra and one due to fracture of a posterior element are combined using the Combined Values Chart (p. 604). Fractures or compressions of several vertebrae are combined using the Combined Values Chart.</i>			
C. Reduced dislocation of one vertebra.	5	3	6
If two or more vertebrae are dislocated and reduced, combine the estimates using the Combined Values Chart.			
An unreduced dislocation causes impairment until it is reduced; the physician should then evaluate the impairment on the basis of the individual's condition with the dislocation reduced.			
If no reduction is possible, the physician should evaluate the impairment on the basis of the range-of-motion and neurologic findings according to criteria in this chapter and Chapter 13, The Central and Peripheral Nervous System.			
II. Intervertebral disk or other soft-tissue lesion			
Diagnosis must be based on clinical symptoms and signs and imaging information.			
A. Unoperated on, with no residual signs or symptoms.	0	0	0
B. Unoperated on, with medically documented injury, pain, and rigidity* associated with none to minimal degenerative changes on structural tests.†	4	2	5
C. Unoperated on, stable, with medically documented injury, pain, and rigidity* associated with moderate to severe degenerative changes on structural tests;† includes herniated nucleus pulposus with or without radiculopathy.	6	3	7
D. Surgically treated disk lesion without residual signs or symptoms; includes disk injection.	7	4	8
E. Surgically treated disk lesion with residual, medically documented pain and rigidity.	9	5	10
F. Multiple levels, with or without operations and with or without residual signs or symptoms.	Add 1% per level		
G. Multiple operations <i>with</i> or without residual signs or symptoms	Add 2%		
1. Second operation	Add 1% per operation		
2. Third or subsequent operation	Add 1% per operation		

Specific Spine Disorders

<p>III. Spondylolysis and spondylolisthesis, not operated on</p> <p>A. Spondylolysis or grade I (1%-25% slippage) or grade II (26%-50% slippage) spondylolisthesis, accompanied by medically documented injury that is stable, and medically documented pain and rigidity with or without muscle spasm.</p> <p>B. Grade III (51%-75% slippage) or grade IV (76%-100% slippage) spondylolisthesis, accompanied by medically documented injury that is stable, and medically documented pain and rigidity with or without muscle spasm.</p>	6	3	7
<p>IV. Spinal stenosis, segmental instability, spondylolisthesis, fracture, or dislocation, operated on</p> <p>A. Single-level decompression without spinal fusion and without residual signs or symptoms</p> <p>B. Single-level decompression without spinal fusion with residual signs or symptoms</p> <p>C. Single-level spinal fusion with or without decompression without residual signs or symptoms</p> <p>D. Single-level spinal fusion with or without decompression with residual signs and symptoms</p> <p>E. Multiple levels, operated on, with residual, medically documented pain and rigidity.</p> <p>1. Second operation</p> <p>2. Third or subsequent operation</p>	7	4	8
	9	5	10
	8	4	9
	10	5	12
Add 1% per level			
Add 2%			
Add 1% per operation			

ROM Method: Motor and Sensory Loss

Table 15-15 Determining Impairment Due to Sensory Loss

a. Classification		
Grade	Description of Sensory Deficit	% Sensory Deficit
5	No loss of sensibility, abnormal sensation, or pain	0
4	Distorted superficial tactile sensibility (diminished light touch), with or without minimal abnormal sensations or pain, that is forgotten during activity	1-25
3	Distorted superficial tactile sensibility (diminished light touch and two-point discrimination), with some abnormal sensations or slight pain, that interferes with some activities	26-60
2	Decreased superficial cutaneous pain and tactile sensibility (decreased protective sensibility), with abnormal sensations or moderate pain, that may prevent some activities	61-80
1	Deep cutaneous pain sensibility present; absent superficial pain and tactile sensibility (absent protective sensibility), with abnormal sensations or severe pain, that prevents most activity	81-99
0	Absent sensibility, abnormal sensations, or severe pain that prevents all activity	100

b. Procedure

1.	Identify the area of involvement using the dermatome charts (Figures 15-1 and 15-2).
2.	Identify the nerve(s) that innervate the area(s) (Table 16-12 and Figure 16-48).
3.	Grade the severity of the sensory deficit or pain according to the classification above.
4.	Find the maximum impairment of the extremity(ies) due to sensory deficit or pain for each: spinal nerves (Table 15-8) and brachial plexus (Table 16-14).
5.	Multiply the severity of the sensory deficit by the maximum impairment value to obtain the extremity impairment for each spinal nerve involved.

Table 15-16 Determining Impairment Due to Loss of Power and Motor Deficits

a. Classification		
Grade	Description of Muscle Function	% Motor Deficit
5	Active movement against gravity with full resistance	0
4	Active movement against gravity with some resistance	1-25
3	Active movement against gravity only, without resistance	26-50
2	Active movement with gravity eliminated	51-75
1	Slight contraction and no movement	76-99
0	No contraction	100

b. Procedure

1.	Identify the motion involved, such as flexion, extension, etc.
2.	Identify the muscle(s) performing the motion and the spinal nerve(s) involved.
3.	Grade the severity of motor deficit of individual muscles according to the classification given above.
4.	Find the maximum impairment of the extremity due to motor deficit for each spinal nerve structure involved (Tables 15-18, 16-11, 16-13, and 17-37).
5.	Multiply the severity of the motor deficit by the maximum impairment value to obtain the extremity impairment for each spinal nerve involved.

* Adapted from Medical Research Council. ¹⁶

ROM Method: Motor and Sensory Loss

Table 15-17 Unilateral Spinal Nerve Root Impairment Affecting the Upper Extremity*

Nerve Root Impaired	Maximum % Loss of Function Due to Sensory Deficit or Pain	Maximum % Loss of Function Due to Strength
C5	5	30
C6	8	35
C7	5	35
C8	5	45
T1	5	20

Table 15-18 Unilateral Spinal Nerve Root Impairment Affecting the Lower Extremity*

Nerve Root Impaired	Maximum % Loss of Function Due to Sensory Deficit or Pain	Maximum % Loss of Function Due to Strength
L3	5	20
L4	5	34
L5	5	37
S1	5	20

ROM Method: Patient at MMI

Combine above whole person impairments
as per pg. 604, AMA Guides, 5th Edition.



Almaraz/Guzman I

Almaraz/Guzman I: An impairment rating strictly based on AMA Guides is rebutted by showing that such an impairment rating would result in a permanent disability reward that would be inequitable, disproportionate, and not a fair and accurate measure of the employee's permanent disability. Repealed.

Almaraz/Guzman II

Almaraz/Guzman II: Impairment rating may be arrived at by making comparisons and drawing analogies to scheduled ratings within the four corners of the AMA Guides: Anthony Ferras vs. United Airlines.