



The Guides Newsletter

Expert advice, practical information, and current trends on impairment evaluation

July/August 2009

In this issue

Rating Spinal Nerve Extremity Impairment

Degenerative Disk Disease

Pub Med Citations

In upcoming issues

Examinee Reported History

Complex Regional Pain Syndrome Update

Rating by Analogy: Abusing the *Guides* Fifth Edition: Reflections

Comparison of Two Jurisdictions: California vs Hawaii

Lower Extremity Training Workbook Questions and Answers

Book Review: *Guides to the Evaluation of Disease and Injury*

Observations on the Sixth Edition: Improvement in Impairment Assessment

The *Guides*, Sixth has been reprinted!

The *Guides to the Evaluation of Permanent Impairment*, Sixth Edition, has been reprinted to incorporate updates to the original edition—all found in the *Clarifications and Corrections* document released in 2008.

The reprinted books have been shipping since June 1, 2009, but please e-mail guides6@ama-assn.org with any questions or concerns.

Rating Spinal Nerve Extremity Impairment Using the Sixth Edition

Christopher R. Brigham, MD

The Sixth Edition of the *Guides* did not provide a separate mechanism for rating spinal nerve injuries as extremity impairment; radiculopathy was reflected in the spinal rating process outlined in Chapter 17, The Spine and Pelvis. Certain jurisdictions, such as the Federal Employee Compensation Act (FECA), rate nerve root injury as impairment involving the extremities rather than as part of the spine. For example, a patient may have a spinal injury resulting in a radiculopathy; under FECA, only the impairment resulting from the radiculopathy (ie, the spinal nerve injury) would be rated. The Fifth Edition provided a procedure to assess isolated spinal nerve root impairment, since this was part of the rating system in the range of motion method; however, this was not provided in the Sixth Edition as the range of motion method was discarded. This article presents an approach to rate spinal nerve impairments consistent with the Sixth Edition methodology. This approach should be used only when a jurisdiction mandates ratings for extremities and precludes rating for the spine.

Sixth Edition Rating Process for Peripheral Nerve Injuries

It is helpful to first understand the methodology used in the Sixth Edition to rate for peripheral nerve impairment and how it relates to the Fifth Edition. The clinical assessment process is similar in the two editions; however, the approach to assessing impairment was modified in the Sixth Edition for consistency with the change in methodology. In the Fifth Edition the rating of upper extremity peripheral nerve injuries involved the use of 3 tables. Maximum losses are obtained by using Table 16-15, Maximum Upper Extremity Impairment Due to Unilateral Sensory or Motor Deficits or to Combined 100% Deficits of the Major Peripheral Nerves (5th ed, 492). Sensory deficits are graded by using Table 16-10, Determining Impairment of the Upper Extremity Due to Sensory Deficits or Pain Resulting From Peripheral Nerve Deficits (5th ed, 482). Motor deficits are determined by using Table 16-11, Determining Impairment of the Upper Extremity Due to Motor and Loss-of-Power Deficits Resulting From Peripheral Nerve Disorders Based on Individual Muscle Rating (5th ed, 484).

For example, if a patient had peripheral nerve sensory involvement of the axillary nerve that is assigned according to Table 16-15 (5th ed, 492) a maximum of 5% upper extremity impairment (UEI), and the patient had a grade 3 (moderate) sensory deficit from Table 16-10 (5th ed, 482), which is associated with a 26% to 60% deficit, the impairment could range from 1% UEI (ie, 26% × 5% UEI) to 3% UEI (ie, 60%

The Guides Newsletter Advisory Board

Editor

Christopher R. Brigham, MD
Portland, Maine

Associate Editors

James B. Talmage, MD
Cookeville, Tennessee

Craig Uejo, MD, MPH
San Diego

Editorial Board

Gunnar B.J. Andersson, MD
Chicago, Illinois

Marjorie Eskay-Auerbach, MD, JD
Tucson, Arizona

Robert J. Barth, PhD
Chattanooga, Tennessee

Charles N. Brooks, MD
Bellevue, Washington

Lorne K. Drenfeld MD FRCP(C)
Kahului, Hawaii

Leon H. Ensalada, MD, MPH
Waitsfield, Vermont

Mark Hyman, MD
Los Angeles, CA

Richard T. Katz, MD
St. Louis, Missouri

Mark Melhorn, MD
Wichita, Kansas

Vert Mooney, MD
San Diego, California

Kathryn Mueller, MD
University of Colorado

Glenn B. Pfeffer, MD
Los Angeles, California

James Robinson, MD
Seattle, Washington

Hal Stockbridge, MD
Olympia, Washington

W. Frederick Uehlein, JD
Framingham, Massachusetts

× 5% UEI). The final impairment assignment would be based on the judgment of the physician.

In the Sixth Edition, Table 15-14, Sensory and Motor Severity (6th ed, 425), defines the severity for sensory and motor deficits. The relationship between this table and the upper extremity tables, Table 16-10 (5th ed, 482) and Table 16-11 (5th ed, 484), are presented in Table 1.

In the Sixth Edition, once the evaluator defines the sensory and/or motor deficits on the basis of the descriptions in Table 15-14 (6th ed, 425), Table 15-21, Peripheral Nerve Impairment: Upper Extremity Impairments (6th ed, 436-444), is used to identify the potential impairments on the basis of the severity of the deficit. Using the example of a moderate sensory deficit of the axillary nerve, Table 15-21 (6th ed, 436) notes that the default impairment is 2% UEI and may range from 1% to 3% UEI. The impairment values are identical in the Fifth and Sixth Editions. In the Sixth Edition, the physician does not multiply the extent of the deficit against the maximum value assigned to the nerve; rather, the physician identifies the severity and proceeds directly to Table 15-21 (6th ed, 436) for the associated impairment values. Rather than using clinical judgment to assign the potential impairment within a range (for example, with a moderate sensory deficit of the axillary nerve, a range of 1% to 3% UEI), with the Sixth Edition the physician uses the adjustment process to determine which specific impairment is assigned.

The values assigned to Table 15-21, Peripheral Nerve Impairment: Upper Extremity Impairments (6th ed, 436-444), and Table 16-12, Peripheral Nerve Impairment: Lower Extremity Impairments (6th ed, 534-536), were obtained directly from the values assigned in the Fifth Edition, ie, Table 16-15, Maximum Upper Extremity Impairment Due to Unilateral Sensory or Motor Deficits or to *Combined* 100% Deficits of the Major Peripheral Nerves (5th ed, 492), and Table 17-37, Impairments Due to Nerve Deficits (5th ed, 552). The maximum loss for each nerve is the same in the Fifth and Sixth Editions. The impairment values for the severity of the deficit (ie, mild, moderate, severe, and very severe) were obtained by determining the range of impairments that would be associated with Fifth Edition ratings. As noted, with a moderate sensory deficit, in the Fifth Edition the multiplier would be between 26% and 60%; therefore, to provide the 5 unit values for a moderate sensory deficit in the Sixth Edition, the maximum impairment value for that nerve (obtained from the Fifth Edition) would be multiplied by 26%, 34.5%, 43%, 51.5%, and 60%, ie, yielding the values (if there was a maximum loss of 5%) of 1% UEI, 2% UEI, 2% UEI, 3% UEI, and 3% UEI. At times, the values would be modified to reflect the minimum and maximum values assigned to a class.

In the Sixth Edition, impairment for radiculopathy is reflected in the diagnosis-based impairment (DBI) for the spinal region. In developing an alternative approach to rating isolated radiculopathy, it is important to provide consistency in impairment ratings among the chapters. An individual with an intervertebral disk herniation with documented resolved radiculopathy or nonverifiable radicular complaints at the clinically appropriate levels present at the time of examination is assigned a class 1 impairment. If there is an intervertebral disk herniation at a single level with documented radiculopathy, class 2 is assigned, and for intervertebral disk herniations at multiple levels with multiple-level or bilateral radiculopathy, class 4 is assigned.

Cervical spine intervertebral disc herniations are rated per Table 17-2, Cervical Spine Regional Grid: Spine Impairments (6th ed, 564-566); the default, grade C, impairment for class 1 is 6% whole person impairment (WPI); for class 2, 11% WPI; and for class 4, 28% WPI. Therefore, one can conclude that the incremental impairment for a cervical spine single-level, 1-sided radiculopathy is 5% WPI (eg, 11%–6%) and the maximum incremental impairment for a multiple-level radicu-

Rating Spinal Nerve (continued)

lopathy is 22% WPI (eg, 28%–6%). A 5% WPI per Table 15-11, Impairment Values Calculated From Upper Extremity Impairment, is equivalent to 8% or 9% UEI; therefore, the maximum impairment for an isolated single-level, 1-sided cervical radiculopathy would be 9% UEI. The maximum impairment for multiple-level or bilateral radiculopathy would be 37% UEI.

In a similar manner, lumbar spine intervertebral disc herniations are rated per Table 17-4, Lumbar Spine Regional Grid: Spine Impairments (6th ed, 570-574); the default, grade C, impairment for class 1 is 7% WPI; for class 2, 12% WPI; and for class 4, 29% WPI. Therefore, one can conclude that the incremental impairment for a cervical spine single-level, 1-sided radiculopathy is 5% WPI (eg, 12%–7%) and the maximum incremental impairment for a multiple-level radiculopathy is 22% WPI (eg, 29%–7%). A 5% WPI per Table 16-10, Impairment Values Calculated From Lower Extremity Impairment, is equivalent to 12% or 13% lower extremity impairment (LEI); therefore, the maximum impairment for an isolated single-level, 1-sided lumbar radiculopathy would be 13% LEI. The maximum impairment for multiple-level or bilateral radiculopathy would be 56% LEI.

Applying the Peripheral Nerve Rating Process to Develop Spinal Nerve Rating Tables

With an understanding of the approach used to develop the rating process for peripheral nerve injuries in the Sixth Edition, it is possible to develop spinal nerve rating tables based on the Fifth Edition, ie, Table 15-17, Unilateral Spinal Nerve Root Impairment Affecting the Upper Extremity (5th ed, 424) (also presented as Table 16-13, Maximum Upper Extremity Impairment Due to Unilateral Sensory or Motor Deficits of Individual Spinal Nerves or to Combined 100% Deficits [5th ed, 489]), and Table 15-18, Unilateral Spinal Nerve Root Impairment Affecting the Lower Extremity (5th ed, 424). Most spinal nerve roots (except C6) have a maximum loss of function due to sensory deficit or pain of 5% extremity impairment; this is the same magnitude of impairment provided to the previous example of rating the axillary nerve by the Fifth and Sixth Editions, ie, a moderate sensory deficit of any spinal nerve root (except C6) would range from 1% to 3% extremity impairment.

The maximum motor deficits are capped at 9% UEI and 13% LEI to achieve consistency with the Sixth Edition's Chapter 17, The Spine and Pelvis. From a practical perspective this is not problematic, since, in the context in which the *Guides* are used, it is rare to see motor weakness more severe than "mild" (grade 4/5, which reflects decreased weakness with some resistance). A moderate weakness, grade 3/5, reflects movement against gravity only without resistance, and a severe weakness, grade 2/5, reflects movement with gravity eliminated. The combined sensory and motor impairment cannot exceed 9% UEI or 13% LEI, and the combined impairment for multiple-level or bilateral radiculopathy cannot exceed 37% UEI or 56% LEI.

The proposed new tables that follow (Spinal Nerve Impairment: Upper Extremity Impairments; and Spinal Nerve Impairment: Lower Extremity Impairments) provide values for rating spinal nerve impairment by means of the process defined for the Sixth Edition in rating peripheral nerve injuries. Due to the need for consistency with the Sixth Edition's Chapter 17, The Spine and Pelvis, all impairment values are class 1.

The Sixth Edition, page 430, explains the process for the upper extremity (the lower extremity process is similar):

- In the left column identify the nerve involved and then identify the severity of the sensory and/or motor deficit.
- Adjust the impairment as described in Section 15.3, Adjustment Grid and Grade Modifiers: Non-Key Factors, excluding Table 15-8, Physical Examination Adjustment, since these neurologic examination findings define the impairment values in Table 15-20. Adjustments are made only for functional history (Table 15-7) and clinical studies (Table 15-9) (ie, electrodiagnostic studies)
- Combine motor and sensory impairments at the UEI value.

This same process can be used with the new proposed tables. The correct column and row are identified. The ratings for the sensory component and the motor component are adjusted for functional history and for clinical studies (if electromyography was performed when the patient was near maximum medical improvement). The sensory and the motor ratings are combined.

For example, assume a patient had a C8 radiculopathy that resulted in a mild sensory deficit and mild motor deficit, with a functional history per Table 15-7 (6th ed, 406) consistent with grade modifier 2 and electrodiagnostic studies per Table 15-9 (6th ed, 410) consistent with grade modifier 1. Both the sensory and motor deficits are class 1, associated with a default grade C value of 1% UEI for the sensory deficit and 6% UEI for the motor deficit. The functional history is 1 higher than the class, but the clinical studies are the same as the class; therefore, the adjustment is +1, resulting in grade D and assignment of the value immediately to the right of the default grade. The final impairment would be 1% UEI for the sensory deficit and 9% UEI for the motor deficit, resulting in a combined 10% UEI.

Conclusion

Tables have been developed for the spinal nerves by means of the methodology defined in the Sixth Edition. By using these tables and the process defined in the Sixth Edition, it is possible to rate spinal nerve impairments for jurisdictions that do not permit rating for the spine and require rating for radiculopathy as an extremity impairment.

Rating Spinal Nerve (continued)

Sixth Edition		Fifth Edition		Fifth Edition	
Description	Numeric	Sensory Grade	Sensory Deficit (%)	Motor Grade	Motor Deficit (%)
Normal	0	5	0	5	0
Mild	1	4	1-25	4	1-25
Moderate	2	3	26-60	3	26-50
Severe	3	2	61-80	2	51-75
Very severe or complete loss	4	1/0	81-100	1/0	76-100

Proposed Table 1. Spinal Nerve Impairment: Upper Extremity Impairments

Impairment Class	Class 0	Class 1	Class 2	Class 3	Class 4
Impairment Ranges (UEI)	0	1-13% UEI	14% - 25% UEI	26% - 49% UEI	50% - 100% UEI
Grade		A B C D E	A B C D E	A B C D E	A B C D E
C5	0	0 0 1 1 1 Mild sensory deficit 1 2 2 3 3 Moderate sensory deficit 3 3 4 4 4 Severe sensory deficit 4 4 5 5 5 Very severe sensory deficit 0 2 4 6 8 Mild motor deficit 8 9 9 9 9 Moderate motor deficit 9 9 9 9 9 Severe or very severe motor deficit			
C6	0	0 1 1 2 2 Mild sensory deficit 2 3 3 4 5 Moderate sensory deficit 5 5 6 6 6 Severe sensory deficit 6 7 7 8 8 Very severe sensory deficit 0 2 5 7 9 Mild motor deficit 9 9 9 9 9 Moderate motor deficit 9 9 9 9 9 Severe or very severe motor deficit			
C7	0	0 0 1 1 1 Mild sensory deficit 1 2 2 3 3 Moderate sensory deficit 3 3 4 4 4 Severe sensory deficit 4 4 5 5 5 Very severe sensory deficit 0 2 5 7 9 Mild motor deficit 9 9 9 9 9 Moderate, severe, or very severe motor deficit			

Proposed Table 1 (cont.) Spinal Nerve Impairment: Upper Extremity Impairments

Impairment Class	Class 0	Class 1	Class 2	Class 3	Class 4
Impairment Ranges (UEI)	0	1-13% UEI	14%-25% UEI	26%-49% UEI	50%-100% UEI
Grade		A B C D E	A B C D E	A B C D E	A B C D E
C8	0	0 0 1 1 1 Mild sensory deficit 1 2 2 3 3 Moderate sensory deficit 3 3 4 4 4 Severe sensory deficit 4 4 5 5 5 Very severe sensory deficit 0 3 6 9 9 Mild motor deficit 9 9 9 9 9 Moderate, severe, or very severe motor deficit			
T1	0	0 0 1 1 1 Mild sensory deficit 1 2 2 3 3 Moderate sensory deficit 3 3 4 4 4 Severe sensory deficit 4 4 5 5 5 Very severe sensory deficit 0 1 3 4 5 Mild motor deficit 5 6 8 9 9 Moderate motor deficit 9 9 9 9 9 Severe or very severe motor deficit			

Proposed Table 2. Spinal Nerve Impairment: Lower Extremity Impairments

Impairment Class	Class 0	Class 1	Class 2	Class 3	Class 4
Impairment Ranges (LEI)	0	1-13% LEI	14% - 25% LEI	26% - 49% LEI	50% - 100% LEI
Grade		A B C D E	A B C D E	A B C D E	A B C D E
L3	0	0 0 1 1 1 Mild sensory deficit 1 2 2 3 3 Moderate sensory deficit 3 3 4 4 4 Severe sensory deficit 4 4 5 5 5 Very severe sensory deficit 0 1 3 4 5 Mild motor deficit 5 6 8 9 1 Moderate motor deficit 13 13 13 14 15 Severe or very severe motor deficit			

Rating Spinal Nerve (continued)

Proposed Table 2 (cont.) Spinal Nerve Impairment: Lower Extremity Impairments

Impairment Class	Class 0	Class 1	Class 2	Class 3	Class 4
Impairment Ranges (LEI)	0	1-13% LEI	14%-25% LEI	26%-49% LEI	50%-100% LEI
Grade		A B C D E	A B C D E	A B C D E	A B C D E
L4	0	0 1 1 2 2 Mild sensory deficit 2 3 3 4 5 Moderate sensory deficit 5 5 6 6 6 Severe sensory deficit 6 7 7 8 8 Very severe sensory deficit 0 2 5 7 9 Mild motor deficit 9 11 13 13 13 Moderate, severe, or very severe motor deficit			
L5	0	0 1 1 2 2 Mild sensory deficit 2 3 3 4 5 Moderate sensory deficit 5 5 6 6 6 Severe sensory deficit 6 7 7 8 8 Very severe sensory deficit 0 3 5 7 9 Mild motor deficit 13 13 13 13 13 Moderate, severe, or very severe motor deficit			
S1	0	0 0 1 1 1 Mild sensory deficit 1 2 2 3 3 Moderate sensory deficit 3 3 4 4 4 Severe sensory deficit 4 4 5 5 5 Very severe sensory deficit 0 1 3 4 5 Mild motor deficit 5 6 8 9 10 Moderate motor deficit 13 13 13 13 13 Severe or very severe motor deficit			

Editorial Comment: All articles in the *Guides Newsletter* are peer reviewed. This article was reviewed by contributors to the musculoskeletal and nervous system chapters of the Sixth Edition, including Lorne Drenfeld, MD, Marjorie Eskay-Auerbach, MD, JD, Mark Melhorn, MD, Richard T. Katz, MD, James B. Talmage, MD, and Craig Uejo, MD, MPH.