

I've Got Your Number:

Comparing Impairment Rating Evaluations Using the AMA Guides™

15th Annual Workers' Compensation Conference

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Hershey, PA

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Disclosures – Chris Brigham, MD

- Senior Contributing Editor, Sixth Edition (no royalties)
- Editor-in-Chief, *AMA Guides Newsletter* and *Guides Casebook* (royalties)
- Consults on impairment and disability evaluation and management (receives fees)
- Developer of web-based resources (www.impairmentcheck.com, www.impairment.com, www.6thedition.com and other sites) (receives fees)

This presentation is neither endorsed nor sponsored by the American Medical Association; opinion and the content of the presentation present the views of the presenter and not necessarily those of the AMA.

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Goals

- Describe the differences in numeric ratings with the Fourth, Fifth and Sixth Editions of the *AMA Guides™*.
- Explain how ratings are performed using different Editions.
- Understand how pain and psychiatric injuries are rated.
- Answer your questions related to impairment ratings.

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Questions

- Is it reasonable to use impairment as a threshold for disability benefits?
- Is 50% whole person permanent impairment an appropriate threshold?
- “The most recent” Edition of the *AMA Guides™* in 1996 was the Fourth Edition; however this Edition is out dated (23 years old) and no longer the “most recent”. What is meant by “most recent”?
- Is it appropriate to delegate authority and discretion to an independent agency, i.e. the AMA?

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“the most recent”

Legal vs. Medical

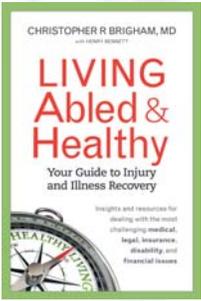
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Impairment ≠ Disability

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Contrasts: Challenged and Empowered vs. Needlessly Disabled

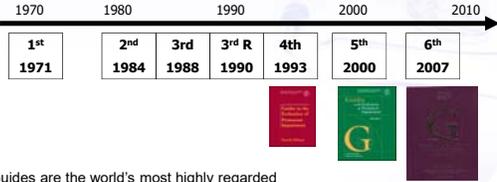
- Resiliency and adaptability are greater determinants of disability than impairment.
- Health and impact from injury and illness must be approached from a biopsychosocial perspective.



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 Your Guide to Injury and Illness Recovery
 Insights and resources for dealing with the most challenging medical, legal, insurance, disability, and financial issues

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Evolution of the AMA Guides™



1970 1980 1990 2000 2010

1 st 1971	2 nd 1984	3 rd 1988	3 rd R 1990	4 th 1993	5 th 2000	6 th 2007
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AMA Guides are the world's most highly regarded standard for assessing impairment, use in most US state and Federal workers' compensation systems, by many other countries, the United Nations, and World Health Organization.

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Sixth Edition Responded to Prior Edition Concerns

- Prior editions
 - Did not provide a comprehensive, valid, reliable, unbiased, and evidence-based rating system
 - Some approaches were inconsistent
 - Incorporated principles not consistent with clinical care
 - Key example: Spine surgery resulting in a X% WPI regardless of outcome
 - Resulted in poor inter-rater reliability

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Sixth Edition Goals

- Address prior criticisms
- Enhance validity and reliability of ratings
- Improve internal consistency
- Promote greater precision
- Simplify rating process

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Sixth Edition Five Axioms

1. Adopt updated methodology of International Classification of Functioning, Disability and Health (ICF)
2. Become more diagnosis-based
3. Simplicity and ease
4. Conceptual and methodological congruity
5. Provide rating percentages that consider clinical and functional history, examination and clinical studies

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Sixth Edition Innovations

- Conceptual framework of International Classification of Functioning, Disability and Health
- Focus on Diagnosis-Based Impairments, with consideration of function, physical examination, and clinical studies

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Sixth Edition Rating Values

- Expert consensus based with consideration of prior values
- Changes in rating values:
 - Providing impairment ratings for conditions not previously ratable, yet resulting in loss
 - Not providing additional impairment for surgery (and other therapies intended to improve function) and thus decrease impairment
 - Adjustments for improved results (i.e. joint replacements)

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AMA Guides™ Newsletter
Expert advice, practical information, and current trends on impairment evaluation

Comparative Analysis of AMA Guides Ratings by the Fourth, Fifth, and Sixth Editions
By Christopher R. Brigham, MD, Craig Ugo, MD, MPH, Anne M. Evans, and Luke D'Elia

Background
The AMA Guide to the Evaluation of Permanent Impairment (Guides) is the most widely used tool for quantifying the extent of loss associated with an injury or illness. In November 2015, the American Medical Association published the most recent edition, the Sixth Edition. The Fourth Edition was published in 1997 and the Fifth Edition in 2002. As with other series of Editions, content and approaches are reviewed with care for clarity, or confusion, user experience are based on feedback and are changed from previous and new approaches are adopted. The new cover with the new and improved of impairment. With the change in impairment methodology, there will also be changes in impairment values associated with specific conditions. The clinical authors and users will have a new set of values of impairment, it is hoped that improved outcomes of better impairment assessment associated with injury and illness.

Key Findings
The Sixth Edition introduces a new approach to rating impairment. An assessment methodology is used to evaluate the degree of impairment ratings. This new method introduces a greater degree of precision, and simplifies the rating process. This approach is based on an expansion of the conceptual framework of the International Classification of Functioning, Disability, and Health, although some of the fundamental principles underlying the Guides remain unchanged.

There have been changes associated with the use of the Guides, including updates to the Guides text:

- The revised text provides a comprehensive, valid, reliable, relevant, and evidence-based rating system.
- Impairment ratings do not arbitrarily or incorrectly reflect loss of function.
- Functional ratings are now the cornerstone of "high-level" and "medical utility." In response to these changes, the following changes were recommended with the Sixth Edition:
- Re-evaluation of accuracy of data being furnished was used with physical impairment.
- Apply functional assessment tools to evaluate impairment rating results.
- Include revision of functional base on the impairment rating.
- Improve overall content and user experience and overall consistency.

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Goals of Study

- Assess the overall impact on impairment ratings by the use of evolving Editions
- Determine the average ratings (in a sample population) by case and diagnosis, including analysis by:
 - Type of impairment
 - Diagnosis
 - Impact of surgery
 - Ratings by grouping from Fourth and Fifth Edition

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Study

- 200 cases reviewed (cases referred for the assessment of impairment by clients who provide all ratings for review)
- Cases evaluated by experienced raters for the Fourth, Fifth and Sixth Edition on the basis of the clinical information provided
- Excellent inter-rater reliability demonstrated by independent review of 15% of cases
- Study performed by Christopher R. Brigham, MD – has performed similar studies for agencies and governmental entities

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Results

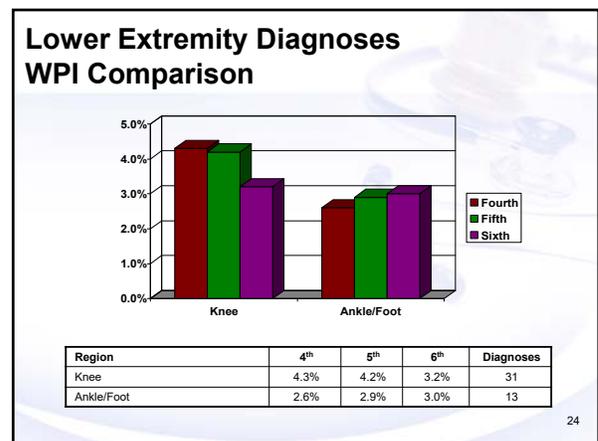
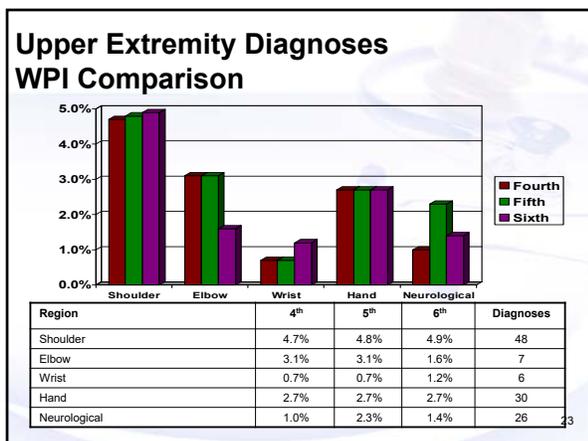
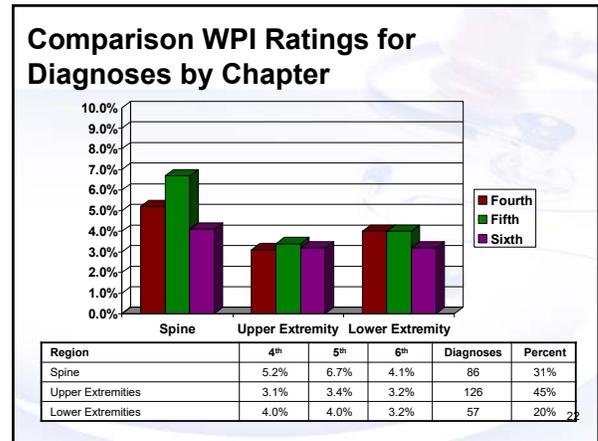
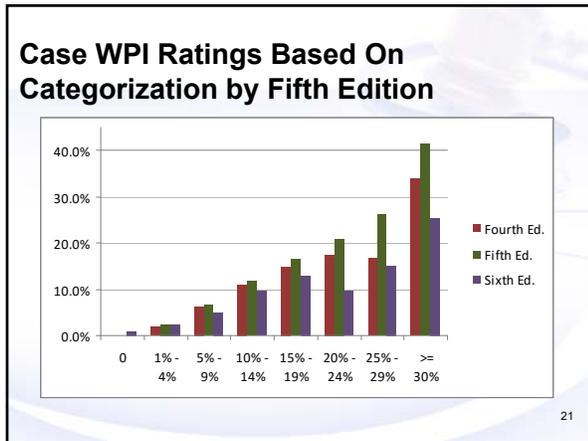
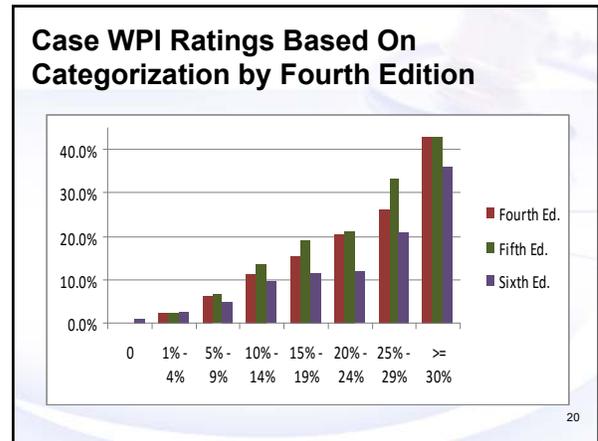
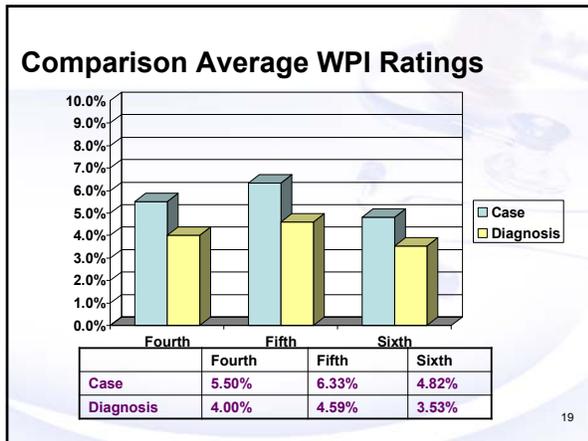
- 200 cases reflected 279 diagnoses
- Age averaged 45 years (range 22 to 79 years)
- Date of evaluation averaged 23 months post injury

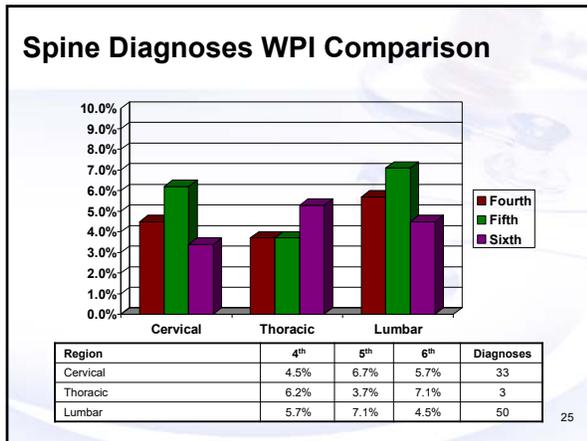
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Sixth Edition Ratings

- 73% Diagnosis-Based Impairments, 22% Range of Motion (extremity), and 5% other
- Majority Class 1 (81%) – Mild Problem
 - Class 0 (6%), Class 2 (8%), Class 3 (5%), Class 4 (0%)
 - Averages for Class, Functional History, Physical Examination and Studies all 1
- Some 0% ratings per prior Editions will have ratable impairment per Sixth Edition
 - 21% of Fifth Ed. Diagnostic ratings had 0% impairment, however 70% of these resulted in ratable impairment by Sixth Ed. Averaging 1% whole person permanent impairment

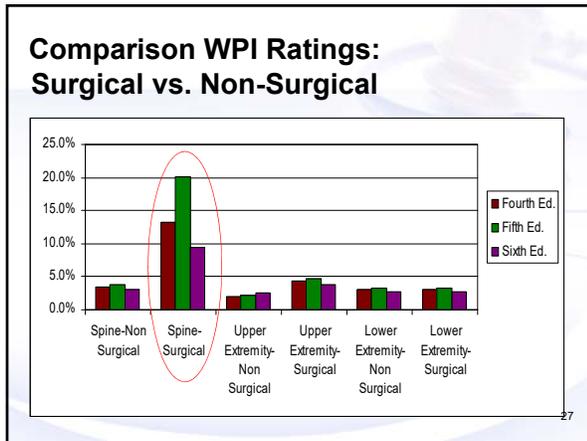
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Comparison WPI Ratings: Surgical vs. Non-Surgical

Category	#	Fourth Ed.	Fifth Ed.	Sixth Ed.
Spine	86	5.2%	6.7%	4.1%
Upper Extremity	126	3.1%	3.4%	3.2%
Lower Extremity	57	4.0%	4.0%	3.2%
Other	8	5.3%	5.3%	5.3%
Non-Surgical	#	Fourth Ed.	Fifth Ed.	Sixth Ed.
Spine	71	3.5%	3.8%	3.0%
Upper Extremity	66	2.0%	2.2%	2.6%
Lower Extremity	20	3.0%	3.2%	2.7%
Surgical	#	Fourth Ed.	Fifth Ed.	Sixth Ed.
Spine	15	13.3%	20.1%	9.5%
Upper Extremity	60	4.4%	4.7%	3.8%
Lower Extremity	37	4.6%	4.5%	3.4%



Comparison WPI Ratings for Common Diagnoses

Diagnosis	ICD-9	Fourth Ed.	Fifth Ed.	Sixth Ed.	#	%
SHOULDER REGION DIS NEC	726.2	4.6%	4.6%	4.8%	36	12.9%
BACKACHE NOS	724.5	2.9%	3.6%	2.0%	29	10.4%
CARPAL TUNNEL SYNDROME	354.0	0.9%	2.4%	1.3%	22	7.9%
DERANGEMENT MENISCUS NEC	717.5	2.1%	2.1%	1.8%	18	6.5%
CERVICALGIA	723.1	0.9%	1.1%	0.7%	17	6.1%
DISC DIS NEC/INOS-LUMBAR	722.93	9.4%	11.3%	7.6%	16	5.7%
SPRAIN OF HAND NOS	842.10	1.8%	1.8%	1.8%	13	4.7%
DISC DIS NEC/INOS-CERV	722.91	7.1%	9.3%	5.8%	12	4.3%
OSTEOARTHRIS NOS-LLEG	715.96	4.9%	4.9%	3.6%	7	2.5%
ROTATOR CUFF SYND NOS	726.10	7.8%	7.8%	6.7%	6	2.2%

Conclusions

- There is no statistically significant difference between ratings when comparing the Sixth Edition to the Fourth Edition, but there is comparing the Sixth Edition to the Fifth Edition.
- Average values had increased from the Fourth Edition to the Fifth Edition without clear scientific rationale.

Sixth Edition - Impairment Rating Considerations

1. What is the problem?
2. What difficulties are reported?
3. What are the exam findings?
4. What are the results of the clinical studies?

**Sixth Edition
Five New Axioms = Five Strategies**

1. Adopt methodology of International Classification of Functioning, Disability and Health (ICF)
2. Become more diagnosis-based, with diagnoses being evidence based
3. Give priority to simplicity and ease
4. Ratings functionally based, to the fullest practical extent possible
5. Stress conceptual and methodological congruity

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**Sixth Edition
Diagnosis-Based Impairment Classes**

- Class 0: No objective problem
- Class 1: Mild problem
- Class 2: Moderate problem
- Class 3: Severe problem
- Class 4: Very severe problem

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Amputation of entire upper extremity = 60% whole person impairment.



The Upper Extremities

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Fourth Edition – Section 3.1

- Refinement of Third Edition, Revised
- Anatomical focus
- Most ratings based on Range of Motion or Peripheral Nerve Loss

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Fifth Edition – Chapter 16

- Principles of assessment clarified
- Finger motion clarified to detect limited excursion of tendons
- Nerve entrapment impairment refined
- Criteria for diagnosis of complex regional pain syndrome (CRPS) added
- Criteria for carpal instability refined
- Criteria for strength loss impairment clarified

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Fourth and Fifth Edition Rating Errors

- Inadequate examination - not comparing to opposite extremity
- Unreliable findings (especially motion, strength and sensory)
- Misapplication of criteria
- Rating for non-verifiable CRPS
- Rating strength loss
 - “Decreased strength cannot be rated in the presence of decreased motion, painful conditions, deformities, or absence of parts (eg, thumb amputation) that prevent effective application of maximal force in the region being evaluated.” (5th ed., 508)

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Sixth Edition – Chapter 15

- 15.1 Principles of Assessment
- 15.2 Diagnosis-Based Impairment
- 15.3 Adjustment Grid and Grade Modifiers: Non Key Factors
- 15.4 Peripheral Nerve Impairment
- 15.5 Complex Regional Pain Syndrome Impairment
- 15.6 Amputation Impairment
- 15.7 Range of Motion Impairment
- 15.8 Summary
- 15.9 Appendix
 - Appendix 15-A Functional Assessment Inventories
 - Appendix 15-B Electrodiagnostic Evaluation of Entrapment Syndromes

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Table 15-3 Wrist Regional Grid (6th ed, 396)

Diagnostic Criteria	Class 0	Class 1	Class 2	Class 3	Class 4
RANGES	0%	1% - 13%	14% - 25%	26% - 49%	50% - 100%
GRADE		A B C D E	A B C D E	A B C D E	A B C D E
Ligament / Bone / Joint					
Triangular fibrocartilage complex (TFCC) Tear	0 No residual findings; +/- surgical treatment	6 7 8 9 10 Documented TFCC injury +/- surgery with residual findings			

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Diagnosis-Based Impairment Regional Grid

Diagnostic Criteria	Class 0	Class 1	Class 2	Class 3	Class 4
RANGES	0%	1% - 13%	14% - 25%	26% - 49%	50% - 100%
GRADE		A B C D E	A B C D E	A B C D E	A B C D E
		##### ↑ Default	##### ↑ Default	##### ↑ Default	##### ↑ Default

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Example: Triangular Fibrocartilage Tear

Diagnosis-Based Impairment

Grid	Class 0	Class 1	Class 2	Class 3	Class 4
Diagnosis	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem

Adjustment Factors – Grade Modifiers

Non-Key Factor	Grid	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Functional History	Table 15-7	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Physical Exam	Table 15-8	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Clinical Studies	Table 15-9	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem

Net Adjustment Formula

- CDX = Class of Diagnosis (Regional Grid)
- GMFH = Grade Modifier for Functional History
- GMPE = Grade Modifier for Physical Exam
- GMCS = Grade Modifier for Clinical Studies

$$\text{Net Adjustment} = (\text{GMFH} - \text{CDX}) + 1 - 1 = 0$$

$$(\text{GMPE} - \text{CDX}) + 0 - 1 = -1$$

$$(\text{GMCS} - \text{CDX}) + 1 - 1 = 0$$

$$-1$$

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Net Adjustment Formula

Adjustment	-2	-1	0	1	2
Grade	A	B	C	D	E

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Table 15-3 Wrist Regional Grid (6th ed, 396)

Diagnostic Criteria	Class 0	Class 1	Class 2	Class 3	Class 4
RANGES	0%	1% - 13%	14% - 25%	26% - 49%	50% - 100%
GRADE		A B C D E	A B C D E	A B C D E	A B C D E
Ligament / Bone / Joint					
Triangular fibrocartilage complex (TFCC) Tear	No residual findings; +/- surgical treatment	Documented TFCC injury +/- surgery with residual findings			

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Amputation of entire lower extremity = 40% whole person impairment.



The Lower Extremity

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Fourth Edition – Section 3.2

- Introduced 13 anatomic, diagnostic and functional methods – “in general, only one evaluation method used”

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Fourth Edition – Section 3.2

- 3.2a Limb Length Discrepancy
- 3.2b Gait Derangement
- 3.2c Muscle Atrophy
- 3.2d Manual Muscle Testing
- 3.2e Range of Motion
- 3.2f Joint Ankylosis
- 3.2g Arthritis
- 3.2h Amputations
- 3.2i Diagnosis-based Estimates
- 3.2k Peripheral Nerve Injuries
- 3.2l Causalgia and Reflex Sympathetic Dystrophy
- 3.2m Vascular Disorders

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Fifth Edition – Chapter 17

- Principles of assessment expanded
- Guide to the Appropriate Combination of Evaluation Methods (Table 17-2) added
- CRPS updated
- Additional case examples provided
- Lower extremity worksheet provided

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Fifth Edition – Chapter 17

- 17.1 Principles of Assessment
- 17.2 Methods of Assessment
 - 17.2a Converting
 - 17.2b Limb Length Discrepancy
 - 17.2c Gait Derangement
 - 17.2d Muscle Atrophy (unilateral)
 - 17.2e Manual Muscle Testing
 - 17.2f Range of Motion
 - 17.2g Joint Ankylosis

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G Fifth Edition – Chapter 17

- 17.2 Methods of Assessment, continued
 - 17.2h Arthritis
 - 17.2j Diagnosis-Based Estimates
 - 17.2k Skin Loss
 - 17.2l Peripheral Nerve Injuries
 - 17.2m Causalgia and Complex Regional Pain Syndrome
 - 17.2n Vascular Disorders
- 17.2 Summary and Examples

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G Fourth and Fifth Edition Rating Errors

- Unreliable examination findings (especially motion and strength)
- Combining duplicative impairments inappropriately
- Rating for gait derangement or muscle strength
- Rating for arthritis without adequate assessment of causation and apportionment

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Sixth Edition – Chapter 16

- 16.1 Principles of Assessment
- 16.2 Diagnosis-Based Impairment
- 16.3 Adjustment Grid and Grade Modifiers: Non Key Factors
- 16.4 Peripheral Nerve Impairment
- 16.5 Complex Regional Pain Syndrome Impairment
- 16.6 Amputation Impairment
- 16.7 Range of Motion Impairment
- 16.8 Summary
- 16.9 Appendix

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Fourth Edition – Section 3.3

- Introduced the Injury or Diagnosis-related Estimates Model
 - primary model used to define impairment
 - 8 categories with fixed impairment value
- Range of Motion Model used as a differentiator
- Surgery does not modify the original impairment

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Fourth Edition – Section 3.3

- 3.3a The Spine History
- 3.3b The Spine Examination
- 3.3c Impressions, Diagnoses, and Impairment Estimates
- 3.3d Evaluating Impairments: The Injury or Diagnosis-related Estimates Model
- 3.3e General Approach and Directions
- 3.3f Specific Procedures and Directions

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Fourth Edition – Section 3.3

- 3.3g Lumbosacral Spine Impairment
- 3.3h Cervicothoracic Spine Impairment
- 3.3i Thoracolumbar Spine Impairment
- 3.3j The Range of Motion Model
- 3.3k Determining Regional Spine Impairment
- 3.4 The Pelvis

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Fifth Edition – Chapter 15

- Use of DRE and ROM Methods modified
- Impairment based on findings at MMI
- DRE impairments encompass a range
- Spinal cord injury based on functional approach
- Differentiators replaced by objective findings
- Alteration of motion segment integrity criteria revised

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Fifth Edition – Chapter 15

- 15.1 Principles of Assessment
- 15.2 Determining the Appropriate Method for Assessment
- 15.3 Diagnosis-Related Estimates Method
- 15.4 DRE: Lumbar Spine
- 15.5 DRE: Thoracic Spine
- 15.6 DRE: Cervical Spine

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Fifth Edition – Chapter 15

- 15.7 Rating Corticospinal Tract Damage
- 15.8 Range-of-Motion Method
- 15.9 ROM: Lumbar Spine
- 15.10 ROM: Thoracic Spine
- 15.11 ROM: Cervical Spine
- 15.12 Nerve Root and/or Spinal Cord
- 15.13 Regional Spine Impairment
- 15.14 The Pelvis
- 15.15 Spine Evaluation Summary

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Fourth and Fifth Edition Rating Errors

- Use of wrong method; most ratings by Diagnosis-Related Estimates (DRE), not Range-of-Motion (ROM)
 - Multilevel degenerative disease not adequate basis to use ROM method
- Assignment to incorrect DRE category
- Assignment of wrong value in DRE range
- Errors in measuring and rating motion

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Sixth Edition – Chapter 17

- 17.1 Principles of Assessment
- 17.2 Diagnosis-Based Impairment
- 17.3 Adjustment Grid and Grade Modifiers: Non-Key Factors
- 17.4 Pelvic Impairment
- 17.5 Summary
- 17.6 Appendix

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Example: Cervical Fusion (Single-Level, Resolved Radiculopathy)

- History:** Cervical injury resulting in C5-C6 disk herniation and Left C6 radiculopathy. Underwent anterior cervical fusion at C5-C6.
- Current Symptoms:** Minimal neck pain only with strenuous activity. No radicular symptoms.
- Functional Assessment:** PDQ 50
- Physical Exam:** Mild motion deficits and slight weakness of wrist extensors (although no other evidence of radiculopathy)
- Clinical Studies:** Pre-op MRI showed disk herniation at C5-6, left. Post-op healed fusion.

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Fourth Edition: Injury Model

- Table 73 DRE Cervicothoracic Spine Impairment Categories (4th ed, 110)
- Category III = 15% WPI

"With the Injury Model, surgery to treat an impairment does not modify the original impairment estimate, which remains the same in spite of any changes in signs or symptoms which follow the surgery and irrespective of whether the patient has a favorable or unfavorable response to treatment" (4th ed, 100)

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Fifth Edition: Diagnosis-Related Estimates Method

- Table 15-5 Criteria for Rating Impairment Due to Cervical Disorders (5th ed, 392)
- DRE Cervical Category IV = 25% - 28% WPI
- Favorable outcome = 25% WPI
- Multilevel fusions rated via Range of Motion Method

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Sixth Edition: Diagnosis-Based Impairment

- Table 17-2 Cervical Spine Regional Grid
- Category: Motion Segment Lesions / Intervertebral disk herniation and/or AOMSI
- Class 1
- Default Impairment: 6% WPI

CLASS 1	4	5	6	7	8
Intervertebral disk herniation or documented AOMSI at a single level or multiple levels with medically documented findings; with or without surgery					
<i>and</i>					
for disk herniation with documented resolved radiculopathy or nonverifiable radicular complaints at the clinically appropriate levels present at the time of examination					

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Sixth Edition: Adjustment Grids – Grade Modifiers

- Functional Assessment**
 - Symptoms with strenuous activity and PDQ 50
 - Grade Modifier 1
- Physical Exam**
 - Motor strength 4/5
 - Grade Modifier 1
- Clinical Studies**
 - Confirms diagnosis
 - Grade Modifier 2

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Sixth Edition: Summary

Diagnosis-Based Impairment

Grid	Class 0	Class 1	Class 2	Class 3	Class 3
Diagnosis / Criteria	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem

Adjustment Factors – Grade Modifiers

Non-Key Factor	Grid	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Functional History	Table 17-6	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Physical Exam	Table 17-7	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Clinical Studies	Table 17-8	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem

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Sixth Edition: Calculation

	CDX	GMFH	GMPE	CMCS
	1	1	1	2

Net Adjustment Calculations

(GMFH-CDX)	1	-	1	=	0
(GMPE-CDX)	1	-	1	=	0
(CMCS-CDX)	2	-	1	=	1
Net Adjustment				=	+1

Result is class 1 with adjustment of +1 from the default value C which equals grade D = 7% WPI

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Sixth Edition: Diagnosis-Based Impairment

- Table 17-2 Cervical Spine Regional Grid
- Category: Motion Segment Lesions / Intervertebral disk herniation and/or AOMSI
- Class 1, Grade D
- Impairment: 7% WPI

CLASS 1	4	5	6	7	8
Intervertebral disk herniation or documented AOMSI at a single level or multiple levels with medically documented findings; with or without surgery					
and					
for disk herniation with documented resolved radiculopathy or nonverifiable radicular complaints at the clinically appropriate levels present at the time of examination					

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Pain

- Subjective, influenced by psychosocial factors
- Fourth Edition
 - No rating
- Sixth Edition
 - Encompassed in the Diagnosis-Based Impairment
 - Rare circumstances (if not otherwise ratable and determined to be reliable) up to 3% WPI

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Mental and Behavioral Disorders

- Fourth Edition
 - No numeric ratings in Chapter 14
 - If secondary to central nervous system impairment (such as head injury), rated by Table 3. Emotional or Behavioral Impairments (4th ed, 142)
- Sixth Edition
 - Typically encompassed by the Diagnosis-Based rating
 - Not rated: psychiatric reactions to pain, somatoform disorders, personality disorders, and substance abuse
 - Rating up to 50% WPI based on consideration of Brief Psychiatric Rating Scale, Global Assessment of Functioning, and Psychiatric Rating Scale

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Conclusions

- Sixth Edition from a medical and scientific perspective is "the most recent" and reflects significant improvements from prior Editions.
- Assessment of impairment will continue to evolve. Updates are provided in the *Guides Newsletter*.
- Impairment and disability are not synonymous.
- Using impairment as a threshold for permanent disability is questionable.

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Thank you
cbrigham@cbrigham.com

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AMA Guides™ Newsletter

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

January/February 2010

In this issue

Comparative Analysis of AMA Guides Ratings by the Fourth, Fifth, and Sixth Editions

Rating Sun-Related Skin Disorders

In upcoming issues

Spinal Cord Injury and the Guides

Causes of Impairment Rating Errors using the Fifth Edition

Observations Based on Review of 6000 Cases

Questions and Answers

Archived Issues Available!

Past issues of the newsletter—since its 1996 debut—are now available at www.ama-assn.org/go/guides-newsletter for purchase and immediate download. A cumulative index arranged by subject and the table of contents for each issue is available to help you quickly locate relevant content.

The *Guides Newsletter* provides updates, authoritative guidance, and AMA interpretations and rationales for the use of the *AMA Guides to the Evaluation of Permanent Impairment*.

Comparative Analysis of AMA Guides Ratings by the Fourth, Fifth, and Sixth Editions*

By Christopher R. Brigham, MD, Craig Uejo, MD, MPH, Aimee McEntire, and Leslie Dilbeck

Background

The *AMA Guides to the Evaluation of Permanent Impairment (Guides)* is the recognized standard for quantifying the medical loss associated with an injury or illness. In December 2007, the American Medical Association published the most recent edition, the Sixth Edition.¹ The Fourth Edition² was published in 1993 and the Fifth Edition³ in 2000. As with other areas of medicine, concepts and approaches are improved with time; for example, in medicine, some treatments are found to be ineffective and are dropped from practice and new approaches are adopted. This also occurs with the medical assessment of impairment. With the change in impairment methodology, there will also be changes in impairment values associated with specific conditions. As clinical medicine evolves and there is increased efficacy of treatment, it is hoped that improved outcomes will reduce impairment previously associated with injury and illness.

The Sixth Edition introduces a new approach to rating impairment. An innovative methodology is used to enhance the relevance of impairment ratings, improve internal consistency, promote greater precision, and simplify the rating process. The approach is based on an adaptation of the conceptual framework of the International Classification of Functioning, Disability, and Health,⁴ although many of the fundamental principles underlying the *Guides* remain unchanged.

There have been challenges associated with the use of the *Guides*, including criticisms of the *Guides* itself.⁵⁻¹² Previous criticisms include the following:

- The method fails to provide a comprehensive, valid, reliable, unbiased, and evidence-based rating system.
- Impairment ratings do not adequately or accurately reflect loss of function.
- Numerical ratings are more the representation of “legal fiction than medical reality.”

In response to these criticisms, the following changes were recommended with the Sixth Edition:

- Standardize assessment of activities of daily living limitations associated with physical impairments.
- Apply functional assessment tools to validate impairment rating scales.
- Include measures of functional loss in the impairment rating.
- Improve overall intrarater and interrater reliability and internal consistency.



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Some changes in the Sixth Edition have impacted impairment ratings. For example, impairment ratings are now included for conditions that may result in functional loss, but previously did not result in ratable impairment (such as nonspecific spinal pain and certain soft-tissue conditions). Additional impairment is typically not provided for surgical interventions, reflecting an underlying concept that treatment is designed to improve function and decrease impairment, with a focus on final outcome. Impairments associated with some diagnoses (eg, total knee replacements, carpal tunnel release, and cervical spine fusion) were revised to more accurately reflect treatment outcomes.

The Sixth Edition states in Chapter 2, Practical Applications of the *Guides* “There is increased use of the *Guides* to translate objective clinical findings into a percentage of the whole person. Typically this number is used to measure the residual deficit, a loss—a number that is then converted to a monetary award to the injured party” (6th ed, 20). In that the *Guides* is used by many workers’ compensation systems to define permanent disability awards, it is appropriate to determine whether changes in editions result in different impairment ratings and different permanent disability awards.

Study

To determine the impact of changes in editions, a study was performed to determine the impairment ratings resulting from use the Fourth, Fifth, and Sixth Editions for various conditions. Two hundred cases were assessed, and the clinical data were used to determine the resulting whole person permanent impairment according to each of these 3 editions. If the case reflected more than 1 diagnosis, each diagnosis was rated, and if both extremities were involved (eg, a bilateral carpal tunnel syndrome), each was rated as a separate diagnosis since each would be associated with a separate impairment. The cases analyzed were referred by 3 clients who refer all impairment ratings to determine their accuracy (2 based in California and 1 in Hawaii) in 2009 to Impairment Resources, LLC. It is probable that these cases reflect typical cases resulting in impairment rating, since the cases were not selectively referred, ie, the referring client did not refer the case because it was atypical or there was a concern about the rating.

Sixty-seven percent of the cases (134 cases) were from California, 28.5% (57 cases) were from Hawaii, and 4.5% (9 cases) were from Nevada. All cases had been originally rated by the Fifth Edition. Each case was independently analyzed by a professional rater experienced in the use of the Fourth, Fifth, and Sixth Editions, using the clinical data provided. Fourteen cases were excluded because the information was insufficient to permit a rating by the three editions, and these cases were replaced to provide a total sample of 200 cases. To ensure reliability, 15% (30) of these cases were blindly reviewed by an independent reviewer; all 30 ratings had interrater agreement within 1% whole person permanent impairment with the exception of one. In that case, there was a 5–percentage point difference between raters in whole person permanent impairment for the Fifth Edition rating because of differing interpretations of the appropriate spinal impairment (using the diagnosis-related estimates approach). There was agreement within 1% whole person permanent impairment for all Sixth Edition ratings.

Results

Two hundred seventy-nine diagnoses were associated with these cases; 48 of the cases had more than one ratable diagnosis. Forty-one percent of these diagnoses (114) involved surgery. The average age of the patients was 45.2 years (range, 22–79 years), and the majority were male (65%). The average time between the date of injury and date of the original impairment evaluation was 23 months (range, 3 months to 12 years).

Seventy-three percent of the Sixth Edition ratings (204 of 279) were based on the diagnosis-based impairment (DBI) approach (including entrapment), 22% of the ratings were based on range of motion (35% of the extremity cases), and 5% involved other approaches. Of the DBI ratings, most (81%) were class 1 (mild problem), with 6% class 0

Comparative Analysis (continued)

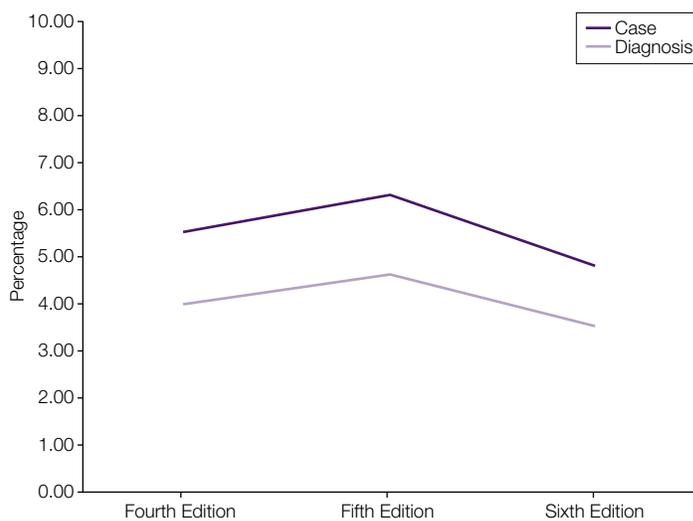
(no problem), 8% class 2 (moderate problem), 5% class 3 (severe problem) and 0% class 4 (very severe problem). The average ratable class was 1.2, with average grade modifiers for functional history adjustment of 1.2; physical examination adjustment, 0.6; and clinical studies, 0.8. Grade A was the most common assignment (34% of the time), followed by grade B (28%), grade C (21%), grade D (21%), and grade E (6%).

The average whole person permanent impairment (WPI) per case was 4.82% WPI per the Sixth Edition, 6.33% WPI per the Fifth Edition, and 5.5% WPI per the Fourth Edition. The overall average whole person permanent impairment for each diagnosis was 3.53% WPI per the Sixth Edition, 4.59% WPI per the Fifth Edition, and 4.00% WPI per the Fourth Edition. This is reflected in Figure 1. The difference between average whole person impairment ratings was tested using a paired sample t-test analysis, with an alpha level set at the .05 level of significance. This analysis revealed a statistically significant difference between average whole person impairment ratings when comparing the Sixth Edition with the Fifth Edition, but not when comparing the Sixth Edition results with those of the Fourth Edition.

With the Sixth Edition there were meaningful changes in impairment ratings as a result of not providing additional impairment for surgical (therapeutic) spine procedures, improved outcomes with surgical release for carpal tunnel syndrome, and improved outcomes with total knee and hip replacement. Excluding the cases that were not impacted by these changes, the overall average whole person permanent impairment for each diagnosis was 3.40% WPI per the Sixth Edition, 3.61% WPI per the Fifth Edition, and 3.16% WPI per the Fourth Edition.

Upper extremity impairments were most common, reflecting 45% of the ratable diagnoses, as shown in Table 1.

Figure 1. Comparison of Average Whole Person Permanent Impairment Ratings by Edition



The average WPI ratings for cases and diagnoses are given in Figure 2.

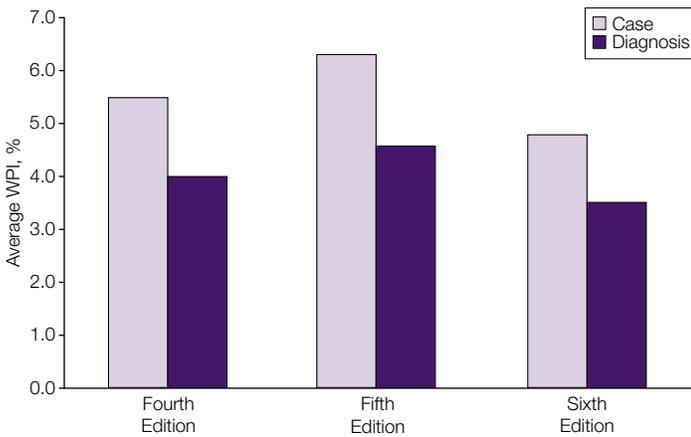
The difference between impairment ratings for diagnoses, grouped as nonsurgical and surgical, was tested using a paired sample *t*-test analysis, with an alpha level set at the .05 level of significance. There was no meaningful difference in the rating values seen for the 165 nonsurgical diagnoses with the Sixth Edition compared with the Fourth Edition (both averaging 2.9% WPI) nor with the Fifth Edition (averaging 3.2% WPI). The most meaningful differences were observed with surgical diagnoses, with the Sixth Edition averaging 4.5% WPI, the Fifth Edition 6.6% WPI, and the Fourth Edition 5.6% WPI. This analysis revealed a statistically significant difference between impairment ratings for surgical diagnoses

Table 1. Comparison of Average Whole Person Permanent Impairment Ratings by Sixth Edition Chapters

Chapter	Title	WPI, %			No. (%) of Diagnoses
		Fourth Edition	Fifth Edition	Sixth Edition	
6	The Digestive System	2.0	2.0	3.0	1 (0.4)
5	The Pulmonary System	25.0	25.0	24.0	1 (0.4)
7	The Urinary and Reproductive Systems	5.0	5.0	5.0	1 (0.4)
12	The Visual System	5.0	5.0	5.0	1 (0.4)
4	The Cardiovascular System	4.0	4.0	3.0	2 (0.7)
11	Ear, Nose, Throat, and Related Structures	1.5	1.5	1.5	2 (0.7)
8	The Skin	1.0	1.0	1.0	2 (0.7)
16	The Lower Extremities	4.0	4.0	3.2	57 (20.4)
17	The Spine and Pelvis	5.2	6.7	4.1	86 (30.8)
15	The Upper Extremities	3.1	3.4	3.2	126 (45.2)
	Total				279 (100.0)

Comparative Analysis (continued)

Figure 2. Comparison of Average Whole Person Permanent Impairment Ratings by Edition



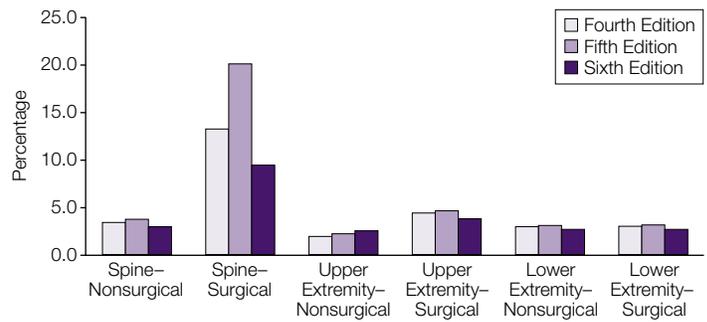
when comparing the Sixth Edition with the Fifth Edition, but not when comparing the Sixth Edition results with those of the Fourth Edition. This finding was expected, given that the Sixth Edition typically does not give additional impairment for surgical (therapeutic) interventions. The most meaningful change in impairment values was for spine-related diagnoses, particularly those that resulted in surgery; the results for musculoskeletal impairments are given in Table 2 and Figure 3.

Twenty-one percent (58) of the 279 diagnosis-based ratings resulted in no ratable impairment per the Fifth Edition; however, of these 0 ratings, 41 (71%) had ratable impairment by the Sixth Edition, with the average impairment

Table 2. Comparison of Average Whole Person Permanent Impairment Musculoskeletal Ratings by Category, Nonsurgical vs Surgical Intervention, and Edition

Category	No.	WPI, %		
		Fourth Edition	Fifth Edition	Sixth Edition
All				
Spine	86	5.2%	6.7%	4.1%
Upper extremity	126	3.1%	3.4%	3.2%
Lower extremity	57	4.0%	4.0%	3.2%
Nonsurgical				
Spine	71	3.5%	3.8%	3.0%
Upper extremity	66	2.0%	2.2%	2.6%
Lower extremity	20	3.0%	3.2%	2.7%
Surgical				
Spine	15	13.3%	20.1%	9.5%
Upper extremity	60	4.4%	4.7%	3.8%
Lower extremity	37	4.6%	4.5%	3.4%

Figure 3. Comparison of Average Whole Person Permanent Impairment Ratings by Category, Nonsurgical vs Surgical Intervention, and Edition



being 1% WPI (66% of these cases involved nonspecific spinal pain and most of the other cases involved soft-tissue injury). Twenty-seven percent (76) of the ratings that resulted in no ratable impairment by the Fourth Edition resulted in an average of 1% WPI when rated with the Sixth Edition.

In analyzing impairments categorized by the value obtained by rating with the Fourth and Fifth Editions, the most meaningful differences were seen with higher-rated impairments. Of the Fifth Edition ratings, 68% (189 diagnoses) were within the range of 1% to 9% WPI. For these cases, the average rating by the Sixth Edition was 3.2% WPI, the Fifth Edition 3.8% WPI, and the Fourth Edition 3.4% WPI. For impairments of 10% WPI and greater by the Fifth Edition, the average rating by the Sixth Edition was 10.2% WPI, the Fifth Edition 16.8% WPI, and the Fourth Edition 14.1% WPI.

Figure 4. Comparison of Average Whole Person Permanent Impairment Ratings Based on Fourth Edition Rating Categorization

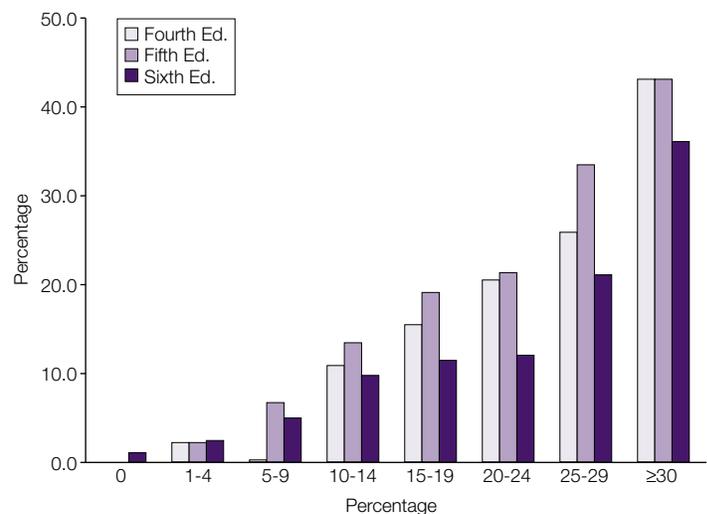
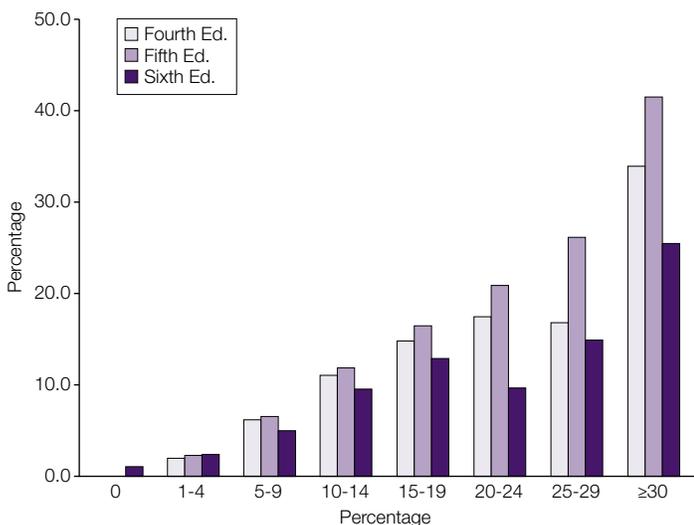


Figure 5. Comparison of Average Whole Person Permanent Impairment Ratings Based on Fifth Edition Rating Categorization



The relative changes in impairment values per case based on categorization by the Fourth and Fifth Edition ratings are illustrated in Figures 4 and 5.

In analyzing the differences for musculoskeletal disorders, the most meaningful changes were for the spine, as reflected in Table 3. There was slight increase in ratings for the shoulder, wrist, and ankle/foot. (Table 3 includes only regions where there were 5 or more ratable diagnoses.) The differences for musculoskeletal regions are illustrated in Figures 6, 7, and 8.

The most common diagnosis (based on assignment by International Classification of Diseases, Ninth Revision [ICD-9]) was shoulder region disease not elsewhere classified (NEC) (726.2), followed by backache not otherwise specified (NOS) (847.2) and carpal tunnel syndrome (354). The impairment values associated with these diagnoses are shown in Table 4.

Summary

There is a statistically significant difference between average whole person impairment ratings when comparing the Sixth Edition with the Fifth Edition, but not when comparing the Sixth Edition results with those of the Fourth Edition. Average values had increased from the Fourth Edition to the Fifth Edition, yet without clear scientific rationale. The average impairment rating in this sample of cases, per the Sixth Edition, was 4.82% WPI, with an average impairment rating per diagnosis of 3.53% WPI. The impact for a patient based on his or her actual diagnostic impairment is small, with a greater difference seen for the Fifth Edition (4.59% WPI, a 1.06–percentage point WPI decrease) than the Fourth Edition (4.00%, a

Figure 6. WPI Comparison for Upper Extremity Diagnoses

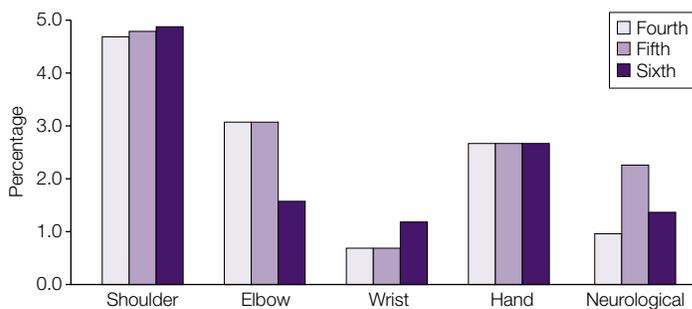


Figure 7. WPI Comparison for Lower Extremity Diagnoses

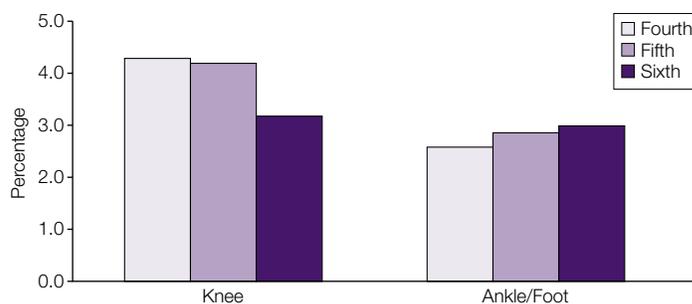
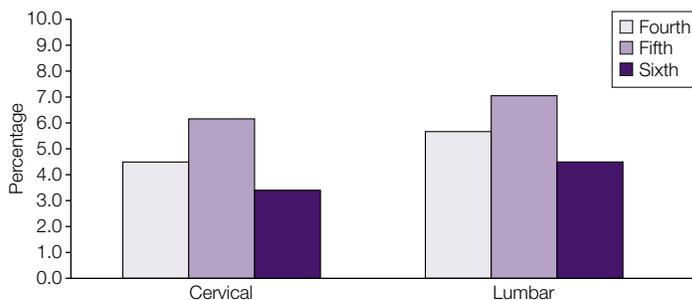


Figure 8. WPI Comparison for Spine Diagnoses



0.47–percentage point WPI decrease). Many of the more meaningful changes were for spine-related diagnoses that resulted in surgery, reflecting the Sixth Edition approach, which bases impairment ratings on the condition and outcome rather than therapeutic interventions including surgery. However, with the Sixth Edition, a substantial percentage of cases that were rated as zero impairment in previous editions will have some ratable impairment.

The observed modest changes in values with the Sixth Edition were expected and primarily due to the recognition that (1) surgery and all therapeutic endeavors should improve function and therefore should not routinely increase impairment, (2) there are improved functional outcomes for

Comparative Analysis (continued)

Table 3. Comparison of Average Whole Person Permanent Impairment Ratings by Region and Edition

Problem	No. of Diagnoses	WPI, %			Difference, Sixth vs Fifth Edition, Percentage Points
		Fourth Edition	Fifth Edition	Sixth Edition	
Upper extremity–shoulder	48	4.7	4.8	4.9	+0.1
Upper extremity–elbow	7	3.1	3.1	1.6	-1.5
Upper extremity–wrist	6	0.7	0.7	1.2	+0.5
Upper extremity–hand	30	2.7	2.7	2.7	0
Upper extremity–neurological	26	1.0	2.3	1.4	-0.9
Lower extremity–knee	31	4.3	4.2	3.2	-1.0
Lower extremity–ankle/foot	13	2.6	2.9	3.0	+0.1
Spine–cervical	33	4.5	6.2	3.4	-2.8
Spine–lumbar	50	5.7	7.1	4.5	-2.6

Table 4. Comparison of Whole Person Permanent Impairment Ratings for Common Diagnoses

Diagnosis	ICD-9 Code	WPI, %			No. (%) of Diagnoses
		Fourth Edition	Fifth Edition	Sixth Edition	
Shoulder region NOS	726.2	4.6	4.6	4.8	36 (12.9)
Backache NOS	724.5	2.9	3.6	2.0	29 (10.4)
Carpal tunnel syndrome	354.0	0.9	2.4	1.3	22 (7.9)
Derangement meniscus NEC	717.5	2.1	2.1	1.8	18 (6.5)
Cervicalgia	723.1	0.9	1.1	0.7	17 (6.1)
Disc disease NEC/NOS–lumbar	722.93	9.4	11.3	7.6	16 (5.7)
Sprain of hand NOS	842.10	1.8	1.8	1.8	13 (4.7)
Disc disease NEC/NOS–cervical	722.91	7.1	9.3	5.8	12 (4.3)
Osteoarthritis, Unspecified–leg	715.96	4.9	4.9	3.6	7 (2.5)
Rotator cuff syndrome NOS	726.10	7.8	7.8	6.7	6 (2.2)
Sprain of ankle NOS	845.00	1.8	2.5	2.3	6 (2.2)
Finger injury NOS	959.5	2.0	2.2	1.8	6 (2.2)
Internal derangement knee NOS	717.9	3.2	3.2	3.0	5 (1.8)
Fracture ankle NOS–closed	824.8	3.8	3.8	4.0	5 (1.8)
Trigger finger	727.03	2.5	2.5	2.0	4 (1.4)
Fracture forearm NOS–closed	813.80	5.8	5.8	4.8	4 (1.4)
Sprain elbow/forearm NOS	841.9	1.5	1.5	1.0	4 (1.4)
Ulnar nerve lesion	354.2	2.0	2.0	2.0	3 (1.1)
Biceps tendon rupture	727.62	1.3	2.0	2.3	3 (1.1)
Fracture lumbar vertebra	805.4	10.0	12.3	9.7	3 (1.1)
Joint replaced knee	V43.65	20.0	20.0	13.3	3 (1.1)

carpal tunnel syndrome and total joint replacement, and (3) certain common conditions that resulted in functional deficits but no ratable impairment in previous editions should be ratable. Excellent interrater reliability with Sixth Edition ratings was demonstrated; this is consistent with one of the goals of the Sixth Edition, to improve the validity and reliability of impairment ratings.

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