

## Disclosures

Los Angeles, February 24, 2011

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paid consultant, author royalties from the AMA, no royalties from the  
*Guides, 6th Edition*

Oakland, February 28, 2011

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*Guides, 6th Edition*

Slide Preparation:

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## Frequent criticisms of the AMA Guides

- Inconsistent and ambiguous definitions & terminology of disablement (*Spine* '83; '88; '93; *J Tenn Med Assoc* '80; *Ann Int Med* '86)
- Content & predictive validity questionable (*JAMA* '82; *Arch PM&R* '97; *JBJS* '98; *JAMA* 2000)
- Reliability questionable (*Am J Phys Med Rehabil* '92)
- Gender bias (*Harvard Law Review* '90)

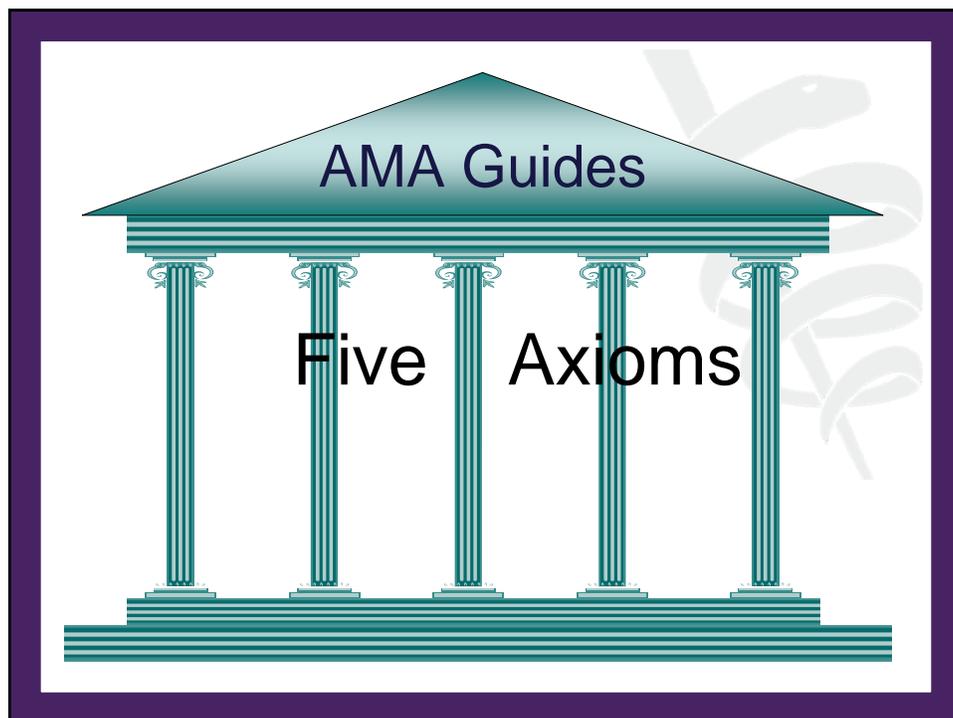
## Shortcomings of AMA Guides 5<sup>th</sup> ed.

Spieler et al, *JAMA* 2000

- Confusing/antiquated terminology
- Inadequate evidence-base
- Ratings fail to reflect perceived or actual loss of function
- Lack of internal consistency

## Sixth Edition Responded to Prior Edition Concerns

- Prior editions
  - Did not provide a comprehensive, valid, reliable, and unbiased-based rating system
  - Some approaches were inconsistent
  - Incorporated principles not consistent with clinical care
    - Key example: Cervical spine surgery resulting in a 25% - 28% WPI regardless of outcome
  - Resulted in poor inter-rater reliability



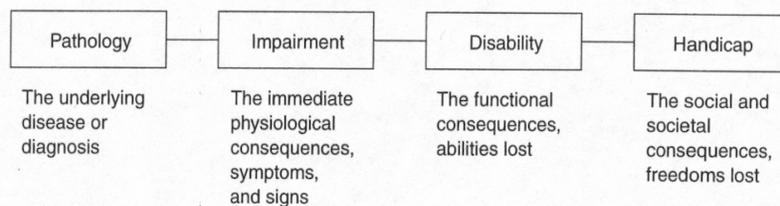
## Axiom 1:

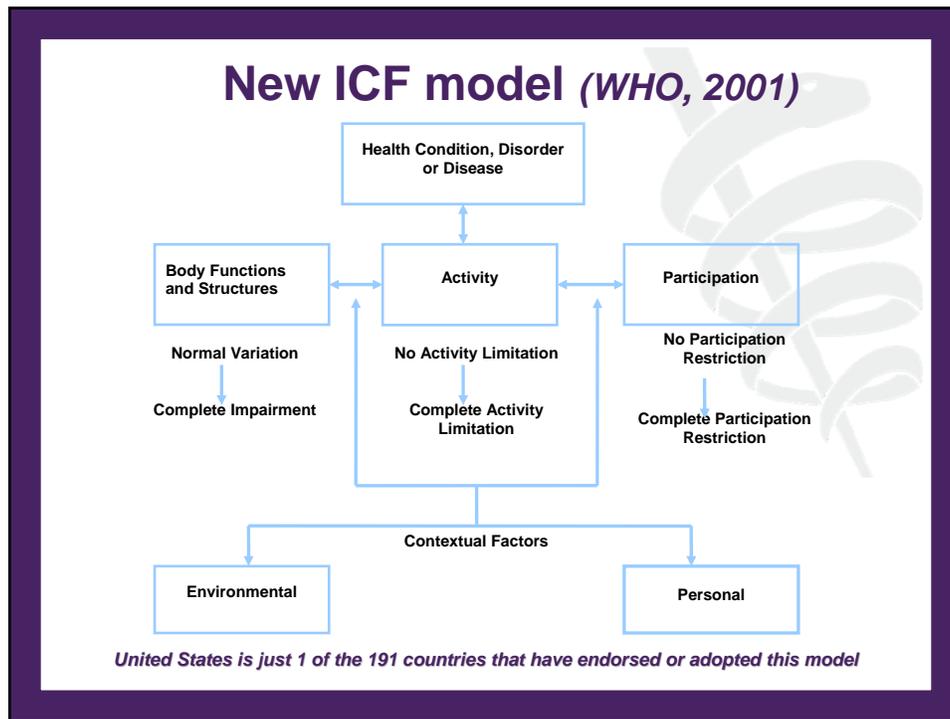
- The *AMA Guides* must adopt the terminology and conceptual framework of disablement as put forward by the International Classification of Functioning, Disability and Health (ICF).

(WHO, 2001)



## Traditional ICIDH model (WHO, 1980)





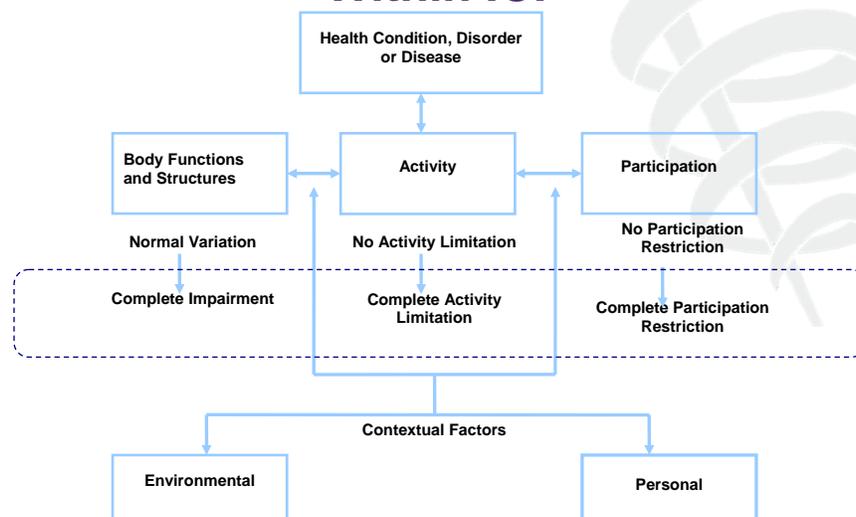
## ICF Terminology

- *Body functions* – physiological/psychological functions of body systems
- *Body structures* – anatomical parts (organs, limbs, & components)
- *Activity* – execution of a task or action by an individual
- *Participation* – involvement in a life situation

## ICF Terminology (2)

- *Impairment* – problem in body function or structure as a significant deviation/loss
- *Activity limitation* – difficulty an individual has in executing an activity
- *Participation restriction* – problem experienced in involvement in a life situation

## Disability as a Continuum Within ICF

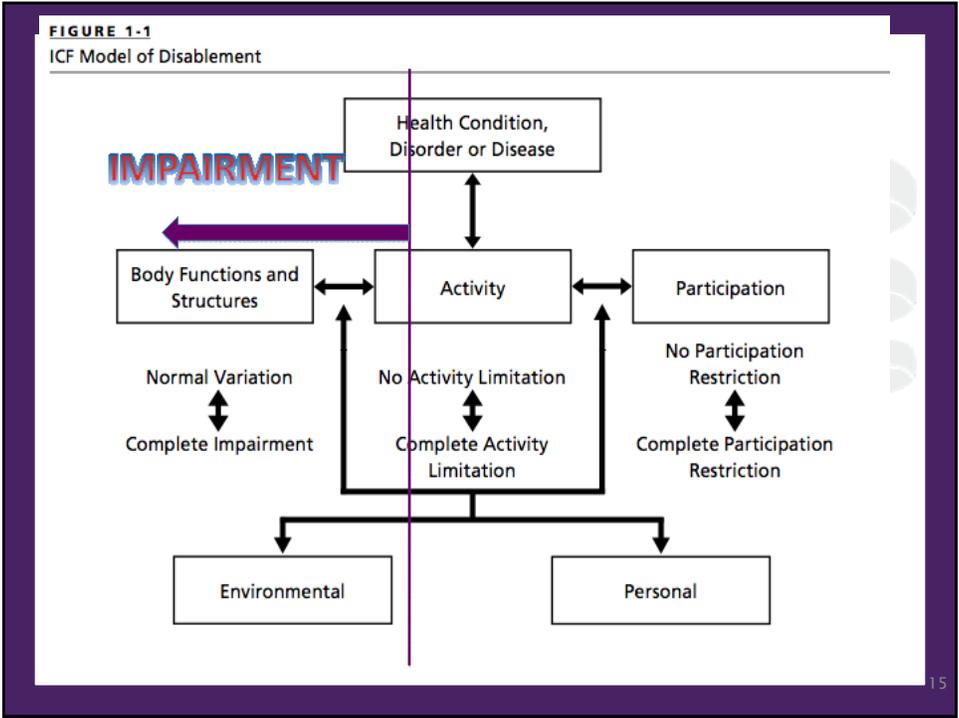


## AMA Definitions (unchanged)

- **Impairment:** a significant deviation, loss or loss of use, of any body structure or body function in an individual with a health condition, disorder or disease
- **Disability:** activity limitation and/or participation restriction in an individual with a health condition, disorder or disease
- **Impairment rating:** a consensus-derived percentage estimate of loss of activity, which reflects *severity of impairment* for a given health condition, and the *degree of associated limitations in terms of activities of daily living (ADLs)*
- **IMPAIRMENT ≠ DISABILITY**

## Impairment vs. Disability

- An impaired individual may or may not have a disability
- Disability involves many intangibles including
  - Functional demands
  - Motivation
  - Limitations on participation



## Tetraplegia as Impairment Rating vs. Work Disability



## AMA Disclaimer

- The *AMA Guides* is not intended to be used for direct estimates of work disability
- Impairment percentages derived according to the *Guides'* criteria do not directly measure work disability
- Therefore, it is inappropriate to use the *Guides'* criteria or ratings to make direct estimates of work disability

## What is the Clinical Relevance of an Impairment Rating?

- “Fix” the diagnosis at Maximum Medical Improvement (MMI)
- Enable case closure when exiting the stage of “temporary disablement”
- Diagnostic and taxonomic classification as segue to recognition of long-term disablement
  - compensation & accommodation
  - apportionment

## Axiom 2:

- The AMA *Guides* must continue to become more evidence-based.

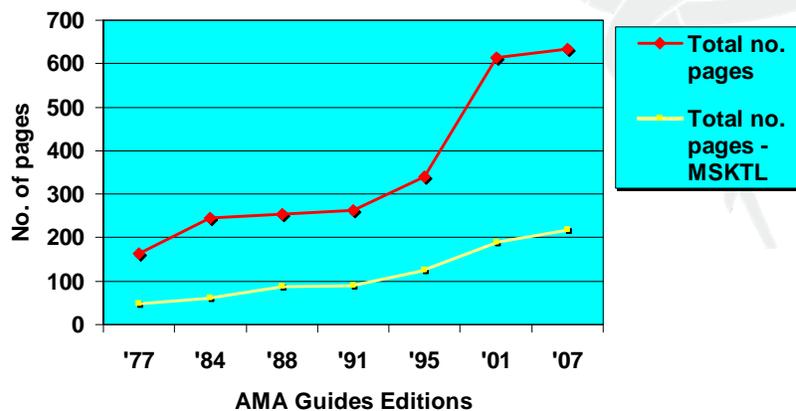
## AMA Evidence-based Approach:

- Historically, numerical ratings for organ system and whole person impairment are based largely on consensus and expert opinion
- Evidence base for impairment percentages assignable to ICF functional levels must await further empirical testing
- Current literature consulted to ensure evidence-based approach for diagnoses used to determine consensus-based impairment ratings
- Normative judgments that are not data driven tend to follow precedent and must await future validation studies

### Axiom 3:

- Wherever/whenever evidence-based criteria are lacking...
  - Simplicity and ease-of-application, in addition, must be given highest priority.

### Historical Trends & Growth of *AMA Guides*



### Axiom 4:

- Rating percentages derived according to the *AMA Guides* must be functionally-based, whenever possible.
  - patient functional history can be assessed according to basic ADLs
  - self-report functional assessment tools also available and applicable

### ICF codes and functional levels

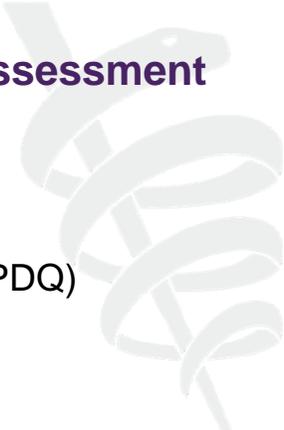
ICF CODE
* xxx.0 NO problem (none, absent, negligible, ...)
* xxx.1 MILD problem (slight, low, ...)
* xxx.2 MODERATE problem (medium, fair, ...)
* xxx.3 SEVERE problem (high, extreme, ...)
* xxx.4 COMPLETE problem (total, ...)

### Sample impairment functional classification

Functional Class
0 No symptoms with strenuous activity (independent)
1 Symptoms with strenuous activity; no Symptoms with normal activity (independent)
2 Symptoms with normal activity (independent)
3 Symptoms with minimal activity (partially dependent)
4 Symptoms at rest (totally dependent)

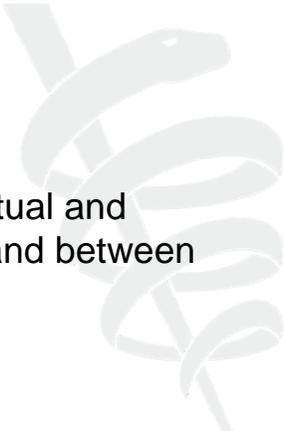


## Orthopedic Functional Assessment Tools



- QuickDASH
- Pain Disability Questionnaire (PDQ)

## Axiom 5:



- *AMA Guides* must stress conceptual and methodological congruity within and between organ system ratings.

## Internal Consistency

- Intent of the *AMA Guides 6<sup>th</sup>* edition is to rate a patient after treatment has been completed
- Uniform “impairment grid” methodology adopted to the fullest extent possible
- Attempt is made to normalize impairment ratings across organ systems to improve internal consistency
- Decisions, in such cases, remain consensus-based and await future validation studies

## Framework for New Methodology

- What is the problem
- What difficulties does the patient report??
- What are the examination findings??
- What do the clinical studies show??
- DIAGNOSIS
- FUNCTIONAL HISTORY
- PHYSICAL EXAM
- CLINICAL STUDIES

## Spine Example:

### Steps to Determine Diagnosis-Based Impairment (DBI)

- 1) Perform Hx & P/E and determine MMI
- 2) Establish appropriate Spine diagnosis
- 3) Use regional “DBI grid” (Cervical/Thoracic/Lumbar/Pelvis) to determine *IC*
- 4) Use “adjustment grid” grade modifiers to determine *IG* within-class
- 5) Assign Spine Impairment Rating (*IR*) according to diagnosis-specific *IC/IG*

## Net Adjustment Calculation

### What do you need?

- CDX = Class of diagnosis
- GMFH = Grade Modifier for Functional Hx
- GMPE = Grade Modifier for Physical Exam
- GMCS = Grade Modifier for Clinical Studies

### NET ADJUSTMENT FORMULA

Net Adjustment =

- $(GMFH - CDX) + (GMPE - CDX) + (GMCS - CDX)$

## Example

- 40 yo male was stocking shelves and repeatedly lifting small appliance boxes. After lifting an unexpectedly heavy box, he experienced the immediate onset of right sided neck pain and right arm pain. He was treated conservatively without improvement. MRI revealed an HNP at C5-6. He underwent an anterior cervical discectomy and fusion with resolution of his arm pain.

33

## Example cont.

- After 4 months, he was at **MMI**. He had **no complaints of arm pain**. His **PDQ score was 45 (he had occasional neck pain)**. **Physical examination findings were negative** except for slightly decreased range of motion. His **radiculopathy was described as resolved**. **Clinical studies confirmed his HNP**.

34

TABLE 17-2 Cervical Spine Regional Grid: Spine Impairments



## Cervical Spine Regional Grid

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RATING (WPI %)	0	1%–8%	9%–14%	15%–24%	25%–30%
<b>MOTION SEGMENT LESIONS</b>					
<div style="border: 1px solid red; padding: 2px;">Intervertebral disc herniation and/or AOMSI<sup>a</sup></div> <p><i>Note:</i> AOMSI includes instability (specifically as defined in the <i>Guides</i>), arthrodesis, failed arthrodesis, dynamic stabilization or arthroplasty, or combinations of those in multiple-level conditions</p>	0 Imaging findings of intervertebral disk herniation without a history of clinically correlating radicular symptoms	4 5 6 7 8 Intervertebral disk herniation(s) or documented AOMSI at a single level or multiple levels with medically documented findings; with or without surgery  <i>and</i> for disk herniation(s) with documented resolved radiculopathy or non-verifiable radicular complaints at the clinically appropriate level(s) present at the time of examination <sup>b</sup>	9 10 11 12 14 Intervertebral disk herniation and/or AOMSI at a single level with medically documented findings; with or without surgery  <i>and</i> with documented residual radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	15 17 19 21 23 Intervertebral disk herniations or AOMSI at multiple levels, with medically documented findings; with or without surgery  <i>and</i> with <del>or without</del> documented signs of residual radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	25 27 28 29 30 Intervertebral disk herniation(s) or AOMSI, with medically documented findings; with or without surgery  <i>and</i> with documented signs of residual bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy)

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CLASS 1 – KEY FACTOR

Default Value

# Non-key factors - Adjustments



**TABLE 17-5**

Adjustment Grid: Summary

Non-Key Factor	Specific Adjustment Grid					
Functional History	Table 17-6	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Physical Examination	Table 17-7	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Clinical Studies	Table 17-9	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem

## Functional Hx

Functional History Factor	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Activity	Asymptomatic; problem resolved; inconsistent symptoms	Pain; symptoms with strenuous/vigorous activity	Pain; symptoms with normal activity	Pain; symptoms with less-than-normal activity (minimal activity)	Pain; symptoms at rest, limited to sedentary activity
PDQ or alternative validated functional assessment, scaled appropriately	No disability PDQ 0	Mild disability PDQ 0-70	Moderate disability PDQ 71-100	Severe disability PDQ 101-130	Extreme disability PDQ 131-150



## Physical Exam

Physical Examination Factor	Grade Modifier 0	Grade Modifier 1
Lumbar Neural Tension Signs	Negative straight leg raising test for radicular pain or invalid examination	
Cervical Compression/Foraminal Compression	Negative cervical compression/foraminal compression	
Reflexes	Normal and symmetrical	
Atrophy UE LE	<1 cm <1 cm	1.0-1.9 cm 1.0-1.9 cm
Sensory Deficit	No loss of sensibility, abnormal sensation, or pain	Diminished light touch (with or without minimal abnormal sensations or pain) in a clinically appropriate distribution, that is forgotten during activity
Motor Strength	Normal Active movement against gravity with full resistance (EMG)	Active movement against gravity and some resistance (EMG)

## Clinical Studies

Clinical Studies Factor	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Imaging studies: Radiographs, bone scan, MRI	Imaging findings do not support symptoms or structural diagnosis within normal limits  or normal age-related changes  or clinically insignificant degenerative changes, or findings on the side opposite clinical presentation		CT/MRI/other imaging findings consistent with clinical presentation, including evidence of AOMSI with segmental instability, fusion, or motion preservation device defined by region (see row below)		Imaging evidence of major surgical complications, including infection or major deformity
Electrodiagnostic testing	Normal		EMG evidence consistent with single nerve root radiculopathy		EMG evidence consistent with multiple nerve root radiculopathy

Note: CT indicates computed tomography; MRI, magnetic resonance imaging; AOMSI, alteration of motion segment integrity; and EMG, electromyographic.

### What do you need?

**CDX = Class of diagnosis** **CDX = 1**  
**GMFH = Grade Modifier for Functional Hx** **GMFH = 1**  
**GMPE = Grade Modifier for Physical Exam** **GMPE = 0**  
**GMCS = Grade Modifier for Clinical Studies** **GMCS = 2**

#### NET ADJUSTMENT FORMULA

**Net Adjustment =**  
 $(GMFH - CDX) + (GMPE - CDX) + (GMCS - CDX)$   
 $(1 - 1) \quad (0 - 1) \quad (2 - 1)$   
 $0 + -1 + 1 = 0$

Net Adjustment Value = 0

A	B	C	D	E
≤ -2	-1	0	+1	≥ +2

CLASS 1				
1%-8%				
A	B	C	D	E
4	5	6	7	8
Intervertebral disk herniation(s) or documented AOMSI at a single level or multiple levels with medically documented findings; with or without surgery and for disk herniation(s) with documented resolved radiculopathy or non-verifiable radicular complaints at the clinically appropriate level(s) present at the time of examination <sup>b</sup>				

## Impairment Rating

- Class 1 – cervical disc herniation with resolved radiculopathy
- Net Adjustment 0 = Class C      Impairment Rating = 6%

MOTION SEGMENT LESIONS					
	0	4 5 6 8	9 10 11 12 14	15 17 19 21 23	25 27 28 29 30
Intervertebral disc herniation and/or AOMSI <sup>a</sup>	Imaging findings of intervertebral disk herniation without a history of clinically correlating radicular symptoms	Intervertebral disk herniation(s) or documented AOMSI at a single level or multiple levels with medically documented findings; with or without surgery  and for disk herniation(s) with documented resolved radiculopathy or non-verifiable radicular complaints at the clinically appropriate level(s) present at the time of examination <sup>b</sup>	Intervertebral disk herniation and/or AOMSI at a single level with medically documented findings; with or without surgery  and with documented residual radiculopathy at the clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	Intervertebral disk herniations or AOMSI at multiple levels, with medically documented findings; with or without surgery  and with or without documented signs of residual radiculopathy at a single clinically appropriate level present at the time of examination (see Table 17-7 to grade radiculopathy)	Intervertebral disk herniation(s) or AOMSI, with medically documented findings; with or without surgery  and with documented signs of residual bilateral or multiple-level radiculopathy at the clinically appropriate levels present at the time of examination (see Table 17-7 to grade radiculopathy)

### **Features of AMA Guides 6<sup>th</sup> ed:**

- ICF Model of Disablement (WHO 2001) replaces outdated ICIDH model (WHO 1980)
- *AMA Guides* is regularly updated with latest, evidence-based diagnostic information
- *AMA Guides* is increasingly diagnosis-based, and therefore user-friendly
- *AMA Guides* is internally-consistent, and can be applied across multiple organ systems

### **Features of AMA Guides 6<sup>th</sup> ed: (2)**

- *AMA Guides* includes a specific modifier for functional history to help capture the impact of impairment on ADLs
- *AMA Guides* ratings now more frequently account for outcomes from treatment rather than the need for treatment including surgery
  - eg. Resolved radiculopathy after discectomy
- *AMA Guides* is transparent and promotes greater inter-rater reliability and agreement

## Who is Currently Using the AMA Guides 6th

- Alaska
- Arizona
- Connecticut\*
- District of Columbia
- Indiana\*\*
- Louisiana
- Mississippi
- Montana
- Rhode Island\*\*\*
- New Mexico
- Oklahoma
- Pennsylvania
- Tennessee
- Wyoming
- Puerto Rico
- Federal Employees' Compensation Act
- Netherlands
- South Africa
- Canada

\* The state of Connecticut allows the use of the Fourth, Fifth and Sixth editions of the AMA, Guides. However, the Connecticut State Medical Society recommends the use of the most recent edition.

\*\* The use of the AMA Guides in Indiana is not required, but using the most current edition of the Guides is recommended by the state.

\*\*\* Passed adoption of the AMA Guides 6<sup>th</sup> ed. June, 2010. Effective January 1, 2011



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



## Conclusions

- There is a statistically significant difference between ratings when comparing the Sixth Edition with the Fifth Edition, but not comparing the Sixth Edition to the Fourth Edition.
- Average values had increased from the Fourth Edition to the Fifth Edition without clear scientific rationale.

## Conclusions

- Many of the more meaningful changes were for spine-related diagnoses that resulted in surgery.
- Diagnoses not previously ratable (e.g. soft tissue) may result in small impairments.
- Consistent process resulted in improved inter-rater reliability.

## Comparative Analysis

- Fourth Edition published in 1993
- Fifth Edition published in 2000
- Sixth Edition published in 2007



- As with other areas of medicine, the assessment of impairment evolves and improves

## 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

## 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 Impairment Resources, LLC (Christopher R. Brigham, MD – has performed similar studies for agencies and governmental entities)

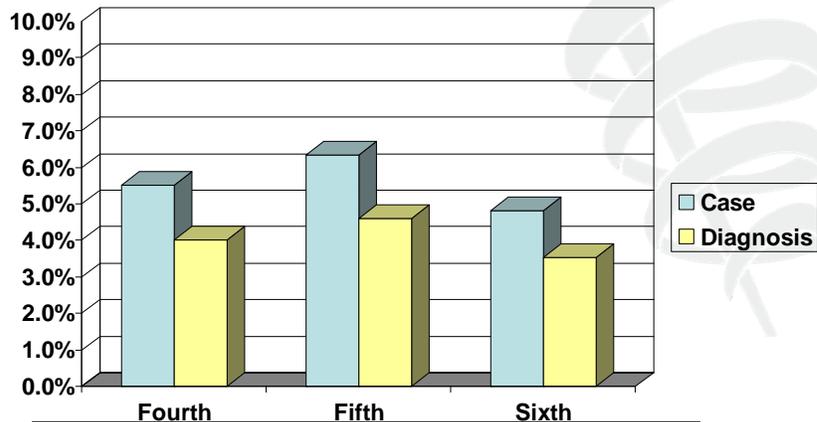
## Results

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

## Sixth Edition Ratings

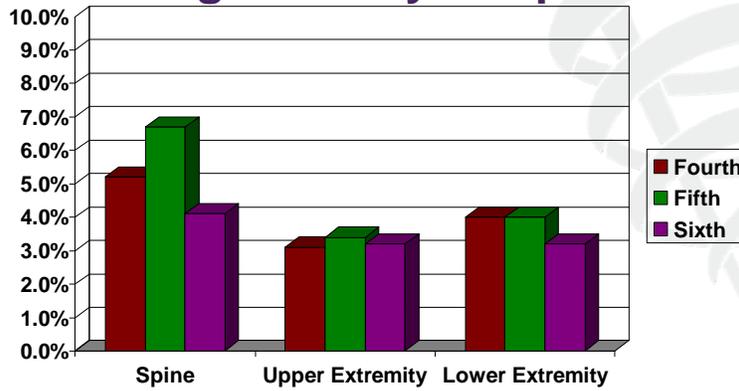
- 73% Diagnosis-Based Impairments, 22% Range of Motion (extremity), and 5% other
- Majority Class 1 (81%) – Mild Problem
  - Class 0 (6%), Class 2 (8%), Class 3 (5%), Class 4 (0%)
  - Averages for Class, Functional History, Physical Examination and Studies all 1
- Some 0% ratings per prior Editions will 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

## Comparison Average WPI Ratings



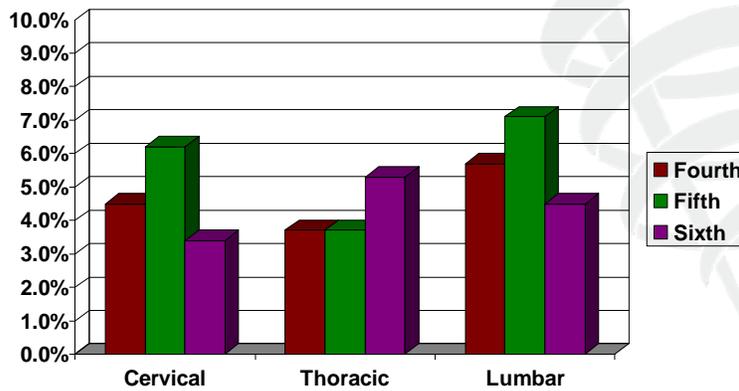
	Fourth	Fifth	Sixth
Case	5.50%	6.33%	4.82%
Diagnosis	4.00%	4.59%	3.53%

### Comparison WPI Ratings for Diagnoses by Chapter



Region	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	Diagnoses	Percent
Spine	5.2%	6.7%	4.1%	86	31%
Upper Extremities	3.1%	3.4%	3.2%	126	45%
Lower Extremities	4.0%	4.0%	3.2%	57	20%

### Spine Diagnoses WPI Comparison

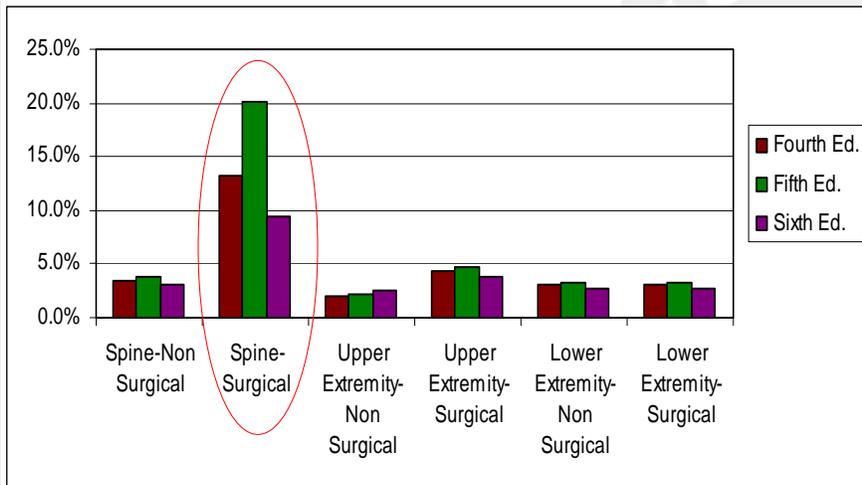


Region	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	Diagnoses
Cervical	4.5%	6.7%	5.7%	33
Thoracic	6.2%	3.7%	7.1%	3
Lumbar	5.7%	7.1%	4.5%	50

## 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%
<b>Non-Surgical</b>	<b>#</b>	<b>Fourth Ed.</b>	<b>Fifth Ed.</b>	<b>Sixth Ed.</b>
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%
<b>Surgical</b>	<b>#</b>	<b>Fourth Ed.</b>	<b>Fifth Ed.</b>	<b>Sixth Ed.</b>
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: Surgical vs. Non-Surgical



## Conclusions

- Intent of the *AMA Guides 6<sup>th</sup>* edition is to rate a patient after treatment has been completed
- There is a statistically significant difference between ratings when comparing the Sixth Edition to the Fifth Edition, but not comparing the Sixth Edition to the Fourth Edition.
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