

**AMA GUIDES 5<sup>TH</sup> EDITION**  
CHAPTER 16 – UPPER EXTREMITIES  
CHAPTER 17 – LOWER EXTREMITIES

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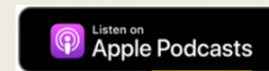
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## Materials Needed!

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## 2005 PDRS – Specific to California

WPI - > earnings, occupation, age adjustments

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### □ Impairment Number

- Section 2 – “choose the closest applicable impairment number”
  - “Carpal Tunnel” or “wrist”?
  - If Guzman rating, use closest impairment;
  - substitute ‘99’ for the last 2 digits



### □ Occupational Group Number

- Section 3
  - use the PDRS resources: Section 3; Part B, Part C, pages 3-27 through 3-37
  - Job duties determine group number; the job ‘title’ isn’t always enough



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## PD String

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1. 7/15/2020 DOI
2. 9/7/1977 DOB
  - ❑ 42 year old billing clerk with right carpal tunnel – median nerve – sensory deficit.
  - ❑ At MMI, 25% sensory deficit (maximum value is 39% UE)
  - ❑ 10% UE = 6% WPI

❑ **RATING STRING:**

**16.01.02.02 – 6 – [1.4]8 – 112H – 8 – 9% PD**

Impairment# - WPI - +40% - Group#/Variant – Occ/Adj - Age = %PD

Reference PDRS page 1-10 (different example)

For 2020 Injury, 9% PD = 27.00 weeks of benefits.

2/3 of AWE:

Maximum AWE = \$435 = \$290 weekly benefit

Minimum AWE = \$240 = \$160 weekly benefit



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## Combine or Add, and CVC

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- ❑ Numbers that are put together for evaluation of impairment/ PD must be either **added or combined**.

**When to combine:**

COMBINE – for most situations—unless specific instructions state to ADD impairment values. The effect/ purpose of combining is that it prevents the combined value from exceeding 100.

AMA Guides: Add UE strength; Combine LE strength



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## AMA Guides

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- Chapter 1 – Philosophy, Purpose, and Appropriate Use
- Chapter 2 – Practical Application
  
- Figures and Tables – Average ‘Normal’
- Interpolate/Round when applicable
- Values: WPI, Upper Extremity, Lower Extremity



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## WPI – 0% - 100%

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From Chapter 1, page 5 of the AMA Guides:

A 0% whole person (WP) impairment rating is assigned to an individual with an impairment if the **impairment has no significant organ or body system functional consequences** and does not limit the performance of the common activities of daily living indicated in Table 1-2. A **90% to 100% WP impairment indicates a very severe organ or body system impairment requiring the individual to be fully dependent on others for self-care, approaching death.**



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**Table 1-2** Activities of Daily Living Commonly Measured in Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) Scales <sup>6,7</sup>

| Activity                       | Example  |
|--------------------------------|--|
| Self-care, personal hygiene    | Urinating, defecating, brushing teeth, combing hair, bathing, dressing oneself, eating |
| Communication                  | Writing, typing, seeing, hearing, speaking   |
| Physical activity              | Standing, sitting, reclining, walking, climbing stairs                                 |
| Sensory function               | Hearing, seeing, tactile feeling, tasting, smelling                                    |
| Nonspecialized hand activities | Grasping, lifting, tactile discrimination  |
| Travel                         | Riding, driving, flying  |
| Sexual function                | Orgasm, ejaculation, lubrication, erection   |
| Sleep                          | Restful, nocturnal sleep pattern   |

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## AMA Guides

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From page 11, within Chapter 1 of the AMA Guides, Section 1.5, Incorporating Science with Clinical Judgment:

- The **physician's judgment**, based upon experience, training, skill, thoroughness in clinical evaluation, **and ability to apply the Guides criteria as intended**, will enable an **appropriate and reproducible assessment to be made of clinical impairment**. Clinical judgment, combining both the "art" and "science" of medicine, constitutes the essence of medical practice.

From page 17, in the Introduction to Chapter 2, Practical Application of the Guides,

- **Two physicians, following the methods of the Guides** to evaluate the same patient, **should report similar results and reach similar conclusions**. Moreover, if the clinical findings are fully described, any knowledgeable observer may check the findings with the Guides criteria.



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## AMA Guides Nature of Physical Injury

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- Impairment
  - Loss affecting ADLs, not work capacity
- Permanent (MMI)
- Objective
- Non-Overlapping
  
- Measurable
  - Consistent
  - Reproducible



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## AMA Guide Nature of Physical Injury

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From the 2009 DWC Conference:

**“General principle of the Guides is to have objective basis for rating impairment”**

Objective findings should lead to the correct Chapter, correct Table, and correct Class or Category

Doctor has discretion for WPI within the selected Class or Category



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# Chapter 16 – The Upper Extremities

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- More precise Impairment values allow more precise measures
- WPI - Whole Person Impairment
- UEI – Upper Extremity Impairment
  - 100% UEI = 60% WPI
- Hand Impairment
  - 100% Hand = 90% UEI
  - Digits
    - Thumb – 100% Thumb = 40% Hand
    - Index, Middle Fingers – 100% Digit = 20% Hand
    - Ring, Little Fingers – 100% Digit = 10% Hand



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Figure 16-1a Upper Extremity Impairment Evaluation Record-Part 1 (Hand)

Side  R  L

Name \_\_\_\_\_ Age \_\_\_\_\_ Sex  M  F Dominant hand  R  L Date \_\_\_\_\_

Occupation \_\_\_\_\_ Diagnosis \_\_\_\_\_

| Abnormal Motion   |                    |                    |                  | Amputation                | Sensory Loss                    | Other Disorders          | Hand Impairment %   |
|---|--------------------|--------------------|------------------|---------------------------|---------------------------------|--------------------------|---|
| Record motion or arthralgia angles and digit impairment % |                    |                    |                  | Mark level & impairment % | Mark type, level & impairment % | List type & impairment % | • Combine digit imp %<br>• Convert to hand imp %  |
|   | Flexion            | Extension          | Arthralgia Imp % |                           |                                 |                          |   |
| Thumb   | Angle <sup>1</sup> |                    |                  |                           |                                 |                          |   |
|   | Triax %            |                    |                  |                           |                                 |                          |   |
|   | Angle <sup>2</sup> |                    |                  |                           |                                 |                          |   |
|   | Imp %              |                    |                  |                           |                                 |                          |   |
| CMC   | Radial abduction   | Angle <sup>1</sup> | Motion           |                           |                                 |                          | Abnormal motion [1]<br>Amputation [2]<br>Sensory loss [3]<br>Other disorders [4]<br>Total digit imp %<br>• Combine 1, 2, 3, 4 |
|   | Adduction          | Imp %              |                  |                           |                                 |                          |   |
|   | Cm                 |                    |                  |                           |                                 |                          |   |
|   | Opposition         | Imp %              |                  |                           |                                 |                          |   |
| Add digit impairment % CMC = MP + IP =                    |                    |                    |                  | [1] Digit IMP % = [2]     | [3] Digit IMP % = [4]           | [4] Digit IMP % = [4]    | Hand Impairment %<br>• Convert above  |
| Index   | Angle <sup>1</sup> |                    |                  |                           |                                 |                          | Abnormal motion [1]<br>Amputation [2]<br>Sensory loss [3]<br>Other disorders [4]<br>Total digit imp %<br>• Combine 1, 2, 3, 4 |
|   | Triax %            |                    |                  |                           |                                 |                          |   |
|   | Angle <sup>2</sup> |                    |                  |                           |                                 |                          |   |
|   | Imp %              |                    |                  |                           |                                 |                          |   |
| • Combine digit impairment % MP, PIP, DIP =               |                    |                    |                  | [1] Digit IMP % = [2]     | [3] Digit IMP % = [4]           | [4] Digit IMP % = [4]    | Hand Impairment %<br>• Convert above  |
| Middle  | Angle <sup>1</sup> |                    |                  |                           |                                 |                          | Abnormal motion [1]<br>Amputation [2]<br>Sensory loss [3]<br>Other disorders [4]<br>Total digit imp %<br>• Combine 1, 2, 3, 4 |
|   | Triax %            |                    |                  |                           |                                 |                          |   |
|   | Angle <sup>2</sup> |                    |                  |                           |                                 |                          |   |
|   | Imp %              |                    |                  |                           |                                 |                          |   |
| • Combine digit impairment % MP, PIP, DIP =               |                    |                    |                  | [1] Digit IMP % = [2]     | [3] Digit IMP % = [4]           | [4] Digit IMP % = [4]    | Hand Impairment %<br>• Convert above  |
| Ring  | Angle <sup>1</sup> |                    |                  |                           |                                 |                          | Abnormal motion [1]<br>Amputation [2]<br>Sensory loss [3]<br>Other disorders [4]<br>Total digit imp %<br>• Combine 1, 2, 3, 4 |
|   | Triax %            |                    |                  |                           |                                 |                          |   |
|   | Angle <sup>2</sup> |                    |                  |                           |                                 |                          |   |
|   | Imp %              |                    |                  |                           |                                 |                          |   |
| • Combine digit impairment % MP, PIP, DIP =               |                    |                    |                  | [1] Digit IMP % = [2]     | [3] Digit IMP % = [4]           | [4] Digit IMP % = [4]    | Hand Impairment %<br>• Convert above  |
| Little  | Angle <sup>1</sup> |                    |                  |                           |                                 |                          | Abnormal motion [1]<br>Amputation [2]<br>Sensory loss [3]<br>Other disorders [4]<br>Total digit imp %<br>• Combine 1, 2, 3, 4 |
|   | Triax %            |                    |                  |                           |                                 |                          |   |
|   | Angle <sup>2</sup> |                    |                  |                           |                                 |                          |   |
|   | Imp %              |                    |                  |                           |                                 |                          |   |
| • Combine digit impairment % MP, PIP, DIP =               |                    |                    |                  | [1] Digit IMP % = [2]     | [3] Digit IMP % = [4]           | [4] Digit IMP % = [4]    | Hand Impairment %<br>• Convert above  |

Total hand impairment: Add hand impairment % for thumb + index + middle + ring + little finger = \_\_\_\_\_ %

Convert total hand impairment to upper extremity impairment\* (if thumb metacarpal intact, enter on Part 2, line B) = \_\_\_\_\_ %

\*Add thumb ray upper extremity amputation imp [3] \_\_\_\_\_ % + hand upper extremity imp \_\_\_\_\_ % = \_\_\_\_\_ %

If hand region impairment is only impairment, convert upper extremity impairment to whole person impairment = \_\_\_\_\_ %

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# Chapter 16 – The Upper Extremities

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**Figure 16-1b** Upper Extremity Impairment Evaluation Record-Part 2 (Wrist, elbow, and shoulder) Side  R  L

Name: \_\_\_\_\_ Age: \_\_\_\_\_ Sex:  M  F Dominant hand:  R  L Date: \_\_\_\_\_

Occupation: \_\_\_\_\_ Diagnosis: \_\_\_\_\_

|   | Abnormal Motion  |         |           |           | Other Disorders                  |  | Regional Impairment %<br>= combine impairment % (I) x (II) | Amputation<br>Mark level & impairment % |
|---|--|---------|-----------|-----------|----------------------------------|--|--|---|
|   | Flexion/extension or abduction/adduction angles and impairment % |         |           |           | List type & combine impairment % |  |  |   |
| Wrist   | Angle*   | Flexion | Extension | Ankylosis | Imp %                            |  |  |   |
|   | Imp %  |         |           |           |                                  |  |  |   |
|   | Angle*   | RD      | UD        | Ankylosis | Imp %                            |  |  |   |
| Elbow   | Angle*   | Flexion | Extension | Ankylosis | Imp %                            |  |  |   |
|   | Imp %  |         |           |           |                                  |  |  |   |
|   | Angle*   | Flexion | Extension | Ankylosis | Imp %                            |  |  |   |
| Shoulder  | Angle*   | Flexion | Extension | Ankylosis | Imp %                            |  |  |   |
|   | Imp %  |         |           |           |                                  |  |  |   |
|   | Angle*   | Flexion | Extension | Ankylosis | Imp %                            |  |  |   |
| Add Imp % Flex/Ext + RD/UD = (I) Imp % = (II)<br>Add Imp % Flex/Ext + Pro/Sup = (I) Imp % = (II)<br>Add Imp % Flex/Ext + Add/Abd + Int Rot/Ext Rot = (I) Imp % = (II) |  |         |           |           |                                  |  |  |   |
| I. Amputation impairment (other than digits) = _____ %  |  |         |           |           |                                  |  |  |   |
| II. Regional impairment of upper extremity<br>*Combine hand, _____ % = wrist, _____ % = elbow, _____ % = shoulder, _____ %  |  |         |           |           |                                  |  |  |   |
| III. Peripheral nerve system impairment = _____ %   |  |         |           |           |                                  |  |  |   |
| IV. Peripheral vascular system impairment = _____ %   |  |         |           |           |                                  |  |  |   |
| V. Other disorders (not included in regional impairment) = _____ %  |  |         |           |           |                                  |  |  |   |
| Total upper extremity impairment (=Combine I, II, III, IV, and V) = _____ %   |  |         |           |           |                                  |  |  |   |
| Impairment of the whole person (Use Table 16-3) = _____ %   |  |         |           |           |                                  |  |  |   |



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\* Combined Values Chart (p. 606).  
 If both limbs are involved, calculate the whole person impairment for each on a separate chart and combine the percents (Combined Values Chart).

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**Table 16-1** Conversion of Impairment of the Digits to Impairment of the Hand\*

| % Impairment of Thumb Hand |  | % Impairment of Index or Middle Finger Hand |  | % Impairment of Ring or Little Finger Hand |  |
|----------------------------|--|---|--|--|--|
| 0 - 1 = 0                  |  | 0 - 2 = 0                                   |  | 0 - 4 = 0                                  |  |
| 2 - 3 = 1                  |  | 3 - 7 = 1                                   |  | 5 - 14 = 1                                 |  |
| 4 - 6 = 2                  |  | 8 - 12 = 2                                  |  | 15 - 24 = 2                                |  |
| 7 - 8 = 3                  |  | 13 - 17 = 3                                 |  | 25 - 34 = 3                                |  |
| 9 - 11 = 4                 |  | 18 - 22 = 4                                 |  | 35 - 44 = 4                                |  |
| 12 - 13 = 5                |  | 23 - 27 = 5                                 |  | 45 - 54 = 5                                |  |
| 14 - 16 = 6                |  | 28 - 32 = 6                                 |  | 55 - 64 = 6                                |  |
| 17 - 18 = 7                |  | 33 - 37 = 7                                 |  | 65 - 74 = 7                                |  |
| 19 - 21 = 8                |  | 38 - 42 = 8                                 |  | 75 - 84 = 8                                |  |
| 22 - 23 = 9                |  | 43 - 47 = 9                                 |  | 85 - 94 = 9                                |  |
| 24 - 26 = 10               |  | 48 - 52 = 10                                |  | 95 - 100 = 10                              |  |
| 27 - 28 = 11               |  | 53 - 57 = 11                                |  |  |  |
| 29 - 31 = 12               |  | 58 - 62 = 12                                |  |  |  |
| 32 - 33 = 13               |  | 63 - 67 = 13                                |  |  |  |
| 34 - 36 = 14               |  | 68 - 72 = 14                                |  |  |  |
| 37 - 38 = 15               |  | 73 - 77 = 15                                |  |  |  |
| 39 - 41 = 16               |  | 78 - 82 = 16                                |  |  |  |
| 42 - 43 = 17               |  | 83 - 87 = 17                                |  |  |  |
| 44 - 46 = 18               |  | 88 - 92 = 18                                |  |  |  |
| 47 - 48 = 19               |  | 93 - 97 = 19                                |  |  |  |
| 49 - 51 = 20               |  | 98 - 100 = 20                               |  |  |  |
| 52 - 53 = 21               |  |   |  |  |  |
| 54 - 56 = 22               |  |   |  |  |  |
| 57 - 58 = 23               |  |   |  |  |  |
| 59 - 61 = 24               |  |   |  |  |  |
| 62 - 63 = 25               |  |   |  |  |  |
| 64 - 66 = 26               |  |   |  |  |  |
| 67 - 68 = 27               |  |   |  |  |  |
| 69 - 71 = 28               |  |   |  |  |  |
| 72 - 73 = 29               |  |   |  |  |  |
| 74 - 76 = 30               |  |   |  |  |  |
| 77 - 78 = 31               |  |   |  |  |  |
| 79 - 81 = 32               |  |   |  |  |  |
| 82 - 83 = 33               |  |   |  |  |  |
| 84 - 86 = 34               |  |   |  |  |  |
| 87 - 88 = 35               |  |   |  |  |  |
| 89 - 91 = 36               |  |   |  |  |  |
| 92 - 93 = 37               |  |   |  |  |  |
| 94 - 96 = 38               |  |   |  |  |  |
| 97 - 98 = 39               |  |   |  |  |  |
| 99 - 100 = 40              |  |   |  |  |  |

\* See Table 16-2 for converting hand impairment to upper extremity impairment.

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## Methods of Evaluation

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- Range of Motion
- Peripheral Neuropathy
  - ▣ Sensory and motor function
    - Carpal Tunnel
- Other Disorders



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## Range of Motion

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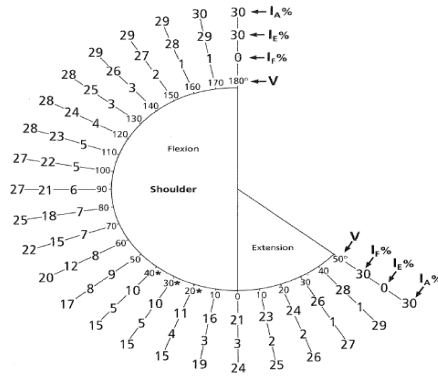
- “Both extremities should be compared” (p. 451)
- Greatest capacity from three consistent measures
    - ▣ Consistent and reproducible
  - If uninvolved “normal” contralateral joint has less than normal ROM, subtract its ROM from impaired joint
    - ▣ Interpolate
    - ▣ Round to a whole number at each step



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**Figure 16-40** Pie Chart of Upper Extremity Motion Impairments Due to Lack of Flexion and Extension of Shoulder

Relative value of this functional unit to upper extremity impairment is 30%.



$I_A\%$  = Impairment due to ankylosis  
 $I_E\%$  = Impairment due to loss of extension  
 $I_F\%$  = Impairment due to loss of flexion  
 $V$  = Measured angles of motion  
 $*$  = Positions of function

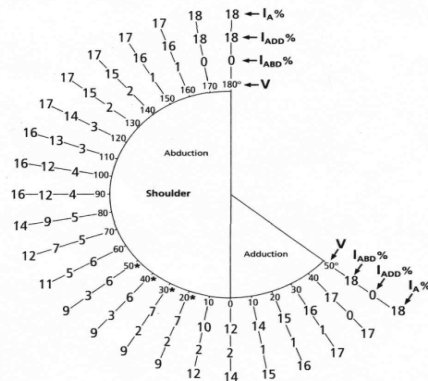
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**Figure 16-43** Pie Chart of Upper Extremity Motion Impairments Due to Lack of Abduction and Adduction of Shoulder

Relative value of this functional unit to upper extremity impairment is 18%.

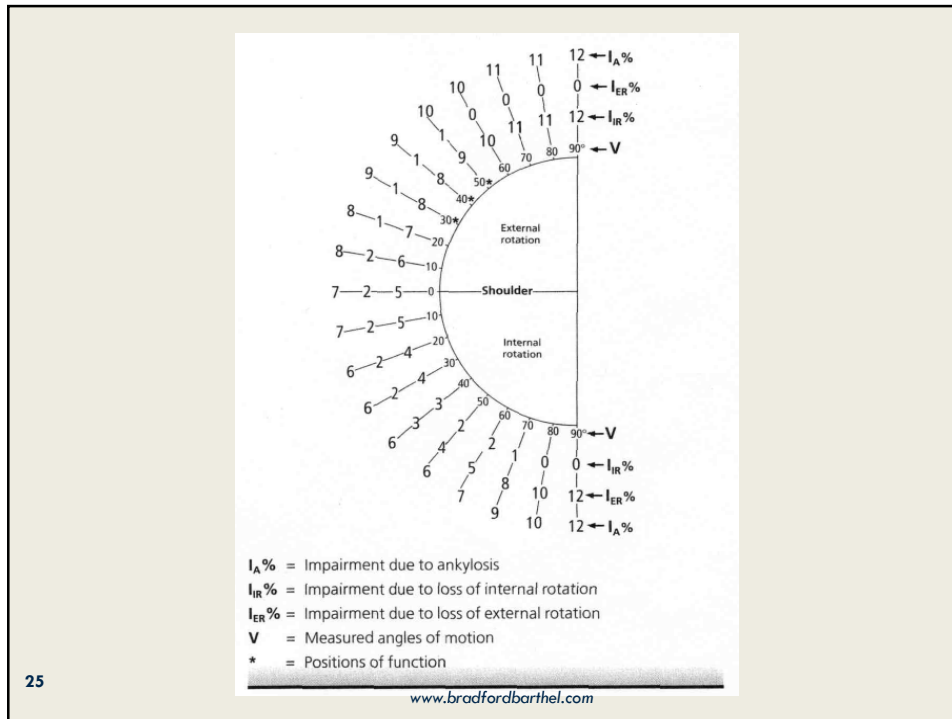


$I_A\%$  = Impairment due to ankylosis  
 $I_{ADD}\%$  = Impairment due to loss of adduction  
 $I_{ABD}\%$  = Impairment due to loss of abduction  
 $V$  = Measured angles of motion  
 $*$  = Positions of function

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## Example – Shoulder Motion

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- Uninjured shoulder with normal motion.
  - Injured shoulder - greatest motion from 3 consistent measures
- |                     |      |                           |
|---------------------|------|---------------------------|
| □ Flexion           | 140° | 3% UE                     |
| □ Extension         | 25°  | 2% UE (interpolate/round) |
| □ Abduction         | 140° | 2% UE                     |
| □ Adduction         | 30°  | 1% UE                     |
| □ External Rotation | 60°  | 0% UE                     |
| □ Internal Rotation | 50   | 2% UE                     |



- ADD: 3 + 2 + 2 + 1 + 0 + 2 = 10% UE = motion impairment

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## Entrapment/ Compression page 493

### Table 16-15 – Max Sensory and Motor Values

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#### Carpal Tunnel (Median Nerve, below midforearm)

#### Carpal Tunnel – p 495

If, after an optimal recovery time following surgical Decompression, an individual continues to complain of pain, paresthesias, and/or difficulties in performing certain activities, three possible scenarios can be present:

1. Positive clinical findings of median nerve dysfunction and electrical conduction delay(s): (See Tables for evaluation)
2. Normal sensibility and opposition strength with abnormal sensory and/or motor latencies or abnormal EMG testing of the thenar muscles = **rating not to exceed 5% UE (3% WPI)**.
3. Normal sensibility (two-point discrimination and Semmes-Weinstein monofilament testing), opposition strength, and nerve conduction studies = 0% UE



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**Table 16-15** Maximum Upper Extremity Impairment Due to Unilateral Sensory or Motor Deficits or to Combined 100% Deficits of the Major Peripheral Nerves

| Nerve                                   | Maximum % Upper Extremity Impairment Due to: |                |                                     |
|---|--|----------------|-------------------------------------|
|   | Sensory Deficit or Pain *                    | Motor Deficit† | Combined Motor and Sensory Deficits |
| Pectorals (medial and lateral)          | 0  | 5              | 5                                   |
| Axillary                                | 5  | 35             | 38                                  |
| Dorsal scapular                         | 0  | 5              | 5                                   |
| Long thoracic                           | 0  | 15             | 15                                  |
| Medial antebrachial cutaneous           | 5  | 0              | 5                                   |
| Medial brachial cutaneous               | 5  | 0              | 5                                   |
| Median (above midforearm)               | 39   | 44             | 66                                  |
| Median (anterior interosseous branch)   | 0  | 15             | 15                                  |
| Median (below midforearm)               | 39   | 10             | 45                                  |
| Radial palmar digital of thumb          | 7  | 0              | 7                                   |
| Ulnar palmar digital of thumb           | 11   | 0              | 11                                  |
| Radial palmar digital of index finger   | 5  | 0              | 5                                   |
| Ulnar palmar digital of index finger    | 4  | 0              | 4                                   |
| Radial palmar digital of middle finger  | 5  | 0              | 5                                   |
| Ulnar palmar digital of middle finger   | 4  | 0              | 4                                   |
| Radial palmar digital of ring finger    | 3  | 0              | 3                                   |
| Musculocutaneous                        | 5  | 25             | 29                                  |
| Radial (upper arm with loss of triceps) | 5  | 42             | 45                                  |
| Radial (elbow with sparing of triceps)  | 5  | 35             | 38                                  |
| Subscapulars (upper and lower)          | 0  | 5              | 5                                   |
| Suprascapular                           | 5  | 16             | 20                                  |
| Thoracodorsal                           | 0  | 10             | 10                                  |
| Ulnar (above midforearm)                | 7  | 46             | 50                                  |
| Ulnar (below midforearm)                | 7  | 35             | 40                                  |
| Ulnar palmar digital of ring finger     | 2  | 0              | 2                                   |
| Radial palmar digital of little finger  | 2  | 0              | 2                                   |
| Ulnar palmar digital of little finger   | 3  | 0              | 3                                   |

\* See Table 16-10a to grade sensory deficits or pain.

† See Table 16-11a to grade motor deficits.

\* From Swanson AB, de Groen Swanson C. Evaluation of permanent impairment in the hand and upper extremity. In: Doogre TC, ed. *Guides to the Evaluation of Permanent Impairment*. Fourth ed. Chicago, IL: American Medical Association; 1993.

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**Table 16-10** Determining Impairment of the Upper Extremity Due to Sensory Deficits or Pain Resulting From Peripheral Nerve Disorders

| a. Classification |  |                   |
|-------------------|--|-------------------|
| Grade             | Description of Sensory Deficit or Pain   | % 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**

- Identify the area of involvement using the cutaneous innervation chart (Figure 16-48) or the dermatome chart (Figure 16-49).
- Identify the nerve structure(s) that innervate the area(s) (Table 16-12 and Figures 16-48, 16-49, and 16-50).
- Grade the severity of the sensory deficit or pain according to the classification given above (a). Use clinical judgment to select the appropriate percentage from the range of values shown for each severity grade.
- Find the maximum upper extremity impairment value due to sensory deficit or pain for each nerve structure involved: spinal nerves (Table 16-13), brachial plexus (Table 16-14), and major peripheral nerves (Table 16-15).
- Multiply the severity of the sensory deficit by the maximum upper extremity impairment value to obtain the upper extremity impairment for each nerve structure involved.

Adapted from Klein DC, Hadwin AB. Operative Results for Major Nerve Injuries, Entrapments, and Diseases. Philadelphia, Pa: WB Saunders Co; 1998:106. Sensibility or insensitive (touch) - severe. In: Probstka S, Bony CE, eds. Impairment of the Hand and Wrist of the Upper Limb. In: The American Academy of Physical Therapy. St Louis, Mo: CV Mosby Co; 1978:313. Omer CE, Birk-Kostelci J. Evaluation of clinical results following peripheral nerve repair. In: Omer CE, Spinner M, Van Beek AL, eds. Management of Peripheral Nerve Problems. 2nd ed. Philadelphia, Pa: WB Saunders Co; 1993:340. Soderbom H. Surgical Disorders of the Peripheral Nerve. 2nd ed. Edinburgh, Scotland: Churchill Livingstone; 1975. Swanson AB, de Groot Swanson G. Evaluation of joint motion impairment in the hand and upper extremity. In: Drape TC, ed. Guides to the Evaluation of Permanent Impairment. 5th ed. Chicago, Ill: American Medical Association; 1993.

**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

| a. Classification |  |                 |
|-------------------|--|-----------------|
| Grade             | Description of Muscle Function   | % Motor Deficit |
| 5                 | Complete active range of motion against gravity with full resistance     | 0               |
| 4                 | Complete active range of motion against gravity with some resistance     | 1- 25           |
| 3                 | Complete active range of motion against gravity only, without resistance | 26- 50          |
| 2                 | Complete active range of motion with gravity eliminated                  | 51- 75          |
| 1                 | Evidence of slight contractility, no joint movement                      | 76- 99          |
| 0                 | No evidence of contractility   | 100             |

**b. Procedure**

- Identify the motion involved, such as flexion, extension, etc.
- Identify the muscle(s) performing the motion and the motor nerve(s) involved.
- Grade the severity of motor deficit of individual muscles according to the classification given above.
- Find the maximum impairment of the upper extremity due to motor deficit for each nerve structure involved: spinal nerves (Table 16-13), brachial plexus (Table 16-14), and major peripheral nerves (Table 16-15).
- Multiply the severity of the motor deficit by the maximum impairment value to obtain the upper extremity impairment for each structure involved.

Adapted from Lovett RW, Frome Oster CE Jr, Bell-Kozlowski J. Evaluation of clinical results following peripheral nerve repair. In: Omer CE Jr, Spinner M, Van Beek AL, eds. Management of Peripheral Nerve Problems. 2nd ed. Philadelphia, Pa: WB Saunders Co; 1993:342. Soderbom H. Surgical Disorders of the Peripheral Nerve. 2nd ed. Edinburgh, Scotland: Churchill Livingstone; 1975. Swanson AB, de Groot Swanson G. Evaluation of joint motion impairment in the hand and upper extremity. In: Drape TC, ed. Guides to the Evaluation of Permanent Impairment. 5th ed. Chicago, Ill: American Medical Association; 1993.

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## Sensory Quality

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AMA Guides - page 446:

The sensory quality is based on the results of the two-point discrimination test carried out over the distal palmar area of the digit, or on the most distal part of the stump in the presence of a partial amputation.



**Table 16-5** Sensory Quality Impairment Classification

| Two-Point Discrimination | Sensory Loss | Sensory Quality Impairment (%) |
|--------------------------|--------------|--------------------------------|
| ≤ 6 mm                   | None         | 0%                             |
| 7-15 mm                  | Partial      | 50%                            |
| > 15 mm                  | Total        | 100%                           |

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## Example – Carpal Tunnel

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- Post Surgical Release
  - ▣ Sensory function on MMI exam – 20% deficit
  - ▣ Motor function on MMI exam – normal – no deficit
  - ▣ Table 16-15
  - ▣ Carpal tunnel – median nerve below midforearm
    - Maximum values
    - 39% UE sensory function x 20% deficit = 7.8% rounded to 8% UE
    - 10% UE motor function x 0% deficit = 0% UE
    - Combine: 8 combined with 0 = 8% UE
    - Convert to WPI: 8% UE (x .6) = 4.8% rounded to 5% WPI



## Other Disorders – Section 16.7

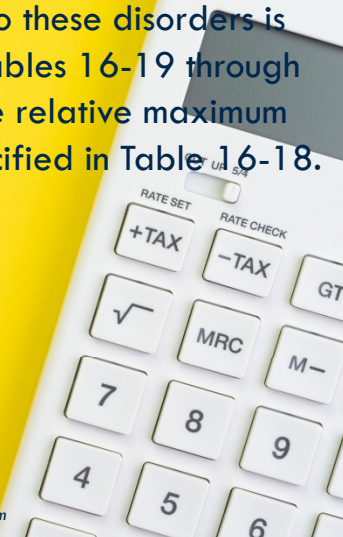
usually requires additional calculation

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The severity of impairment due to these disorders is rated separately according to Tables 16-19 through 16-30 and then multiplied by the relative maximum value of the unit involved as specified in Table 16-18. (page 498)



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## Section 16.7 – ‘Other Disorders’

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**Table 16-18** Maximum Impairment Values for the Digits, Hand, Wrist, Elbow, and Shoulder Due to Disorders of Specific Joints or Units\*

| Units and Joints        | % Impairment of |      |                              |
|-------------------------|-----------------|------|------------------------------|
|                         | Unit            | Hand | Upper Extremity Whole Person |
| <b>Shoulder</b>         |                 |      |                              |
| Glenohumeral            | —               | —    | 60 36                        |
| Acromioclavicular       | —               | —    | 25 15                        |
| Sternoclavicular        | —               | —    | 5 3                          |
| <b>Elbow</b>            |                 |      |                              |
| Entire elbow            | —               | —    | 70 42                        |
| Ulnohumeral             | —               | —    | 50 30                        |
| Proximal radioulnar     | —               | —    | 20 12                        |
| <b>Wrist</b>            |                 |      |                              |
| Entire wrist            | —               | —    | 60 36                        |
| Radiocarpal             | —               | —    | 40 24                        |
| Distal radioulnar       | —               | —    | 20 12                        |
| Proximal carpal row     | —               | —    | 30 18                        |
| <b>Entire hand</b>      | —               | 100  | 90 54                        |
| <b>Thumb</b>            |                 |      |                              |
| Entire thumb            | 100             | 40   | 36 22                        |
| CMC                     | 60              | 24   | 22 13                        |
| MP                      | 15              | 6    | 5 3                          |
| IP                      | 25              | 10   | 9 5                          |
| <b>Index and middle</b> |                 |      |                              |
| Entire finger           | 100             | 20   | 18 11                        |
| MP                      | 50              | 10   | 9 5                          |
| PIP                     | 30              | 6    | 5 3                          |
| DIP                     | 20              | 4    | 4 2                          |
| <b>Ring or little</b>   |                 |      |                              |
| Entire finger           | 100             | 10   | 9 5                          |
| MP                      | 50              | 5    | 5 3                          |
| PIP                     | 30              | 3    | 3 2                          |
| DIP                     | 20              | 2    | 2 1                          |

\*Each value is related to the one larger unit and the whole person.



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## Arthroplasty – Table 16-27

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**Table 16-27** Impairment of the Upper Extremity After Arthroplasty of Specific Bones or Joints

| Level of Arthroplasty         | % Impairment of Upper Extremity |                        |
|-------------------------------|---------------------------------|------------------------|
|                               | Implant Arthroplasty            | Resection Arthroplasty |
| <b>Total shoulder</b>         | 24                              | 30                     |
| Distal clavicle (isolated)    | —                               | 10                     |
| Proximal clavicle (isolated)  | —                               | 3                      |
| <b>Total elbow</b>            | 28                              | 35                     |
| Radial head (isolated)        | 8                               | 10                     |
| <b>Total wrist</b>            | 24                              | —                      |
| Radiocarpal                   | 16                              | —                      |
| Ulnar head (isolated)         | 8                               | 10                     |
| Proximal row carpectomy       | —                               | 12                     |
| Carpal bone (isolated)        | 8                               | 10                     |
| Radial styloid (isolated)     | —                               | 5                      |
| <b>Thumb</b>                  |                                 |                        |
| CMC                           | 9                               | 11                     |
| MP                            | 2                               | 3                      |
| IP                            | 4                               | 5                      |
| <b>Index or middle finger</b> |                                 |                        |
| MP                            | 4                               | 5                      |
| PIP                           | 2                               | 3                      |
| DIP                           | 1                               | 2                      |
| <b>Ring or little finger</b>  |                                 |                        |
| MP                            | 2                               | 2                      |
| PIP                           | 1                               | 1                      |
| DIP                           | 1                               | 1                      |

CMC: thumb carpometacarpal; IP: thumb interphalangeal; MP: metacarpophalangeal; PIP: proximal interphalangeal; DIP: distal interphalangeal.

Modified from Swanson AB, de Groot Swanson G. Principles and methods of impairment evaluation in the hand and upper extremity. In: Engelberg AE, ed. *Guide to the Evaluation of Permanent Impairment*. Third ed. Chicago, IL: American Medical Association; 1989:47; prepared with the assistance of DM Lichtman, Fort Worth, Texas, and EG McFarland, Baltimore, Maryland.



## 'Other Disorders' Strength Evaluation

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(pp. 507-510)

- Grip & Pinch Strength
- Manual Muscle Testing

The AMA Guides directs (p. 507): Because strength measurements are functional tests influenced by subjective factors that are difficult to control and the Guides for the most part is based on anatomic impairment, the Guides does not assign a large role to such measurements.

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## Strength

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- Permanent (MMI)
- Objective
- Non-Overlapping



## Combine or Add, and CVC

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### ADD

ROM for the same part of the body (for example, four motions for the wrist; range of motion impairment for the wrist and shoulder are added only for each joint.)

#### Exception:

The evaluation of hands/ multiple digits, is quite complex. The instructions within Chapter 16 are summarized on page 511. For the thumb, add all ROM impairment at the digit impairment level. For digits 2-5, add ROM impairment for the same joint; combine impairment for separate joints.

**Combine** impairments from **separate methods** of evaluation for the same body part, including digits (for example, ROM and digital sensory loss).



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## Right Shoulder

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- ROM 10% UE
- Arthroplasty/DCR 10% UE
  
- Same body part, two methods
  - ▣ These can be combined (pages 499, 505)
  
- Combine impairment from each method:
  - ▣  $10\% + 10\% = 19\% \text{ UE}$        $19\% \text{ UE} = 11\% \text{ WPI}$



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## UE - Overlap

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- Peripheral Neuropathy
- 'Other Disorders'
  - Check each Method; some combinations are allowed, many are not
  - Strength – usually combining with other methods is not allowed



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## Motion, Peripheral Neuropathy

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- Section 16.5d Entrapment/Compression Neuropathy; page 494:
  - In the absence of CRPS, additional impairment values are not given for decreased motion.
- AMA Guides page 494
  - In compression neuropathies, additional impairment values are not given for decreased grip strength
  - If the examiner judges that loss of strength should be rated separately in an extremity that presents other impairments, the impairment due to loss of strength could be combined with the other impairments, only if based on unrelated etiologic or pathomechanical causes. Otherwise, the impairment ratings based on objective anatomic findings take precedence. 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.



## Other Disorders – Section 16.7

Tables 16-18 through 16-35

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The *AMA Guides* provides additional direction for the use of the Other Disorders section:

- Impairments from the disorders considered in this section under the category of "other disorders" are usually estimated by using other impairment evaluation criteria. *The criteria described in this section should be used only when the other criteria have not adequately encompassed the extent of the impairments.* (p. 499)



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## Chapter 16 Strength - Principles

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Strength impairment is only provided in the “rare case” (p. 508).

Strength loss can be combined with other impairments “only if based on unrelated etiologic or pathomechanical causes.” (p. 508);

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.



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## Maximum WPI Values Table 16-4 (p. 440)

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### Impairment estimates for Upper Limb Amputation

| Amputation Levels   | Impairment % of |      |                 |              |
|---|-----------------|------|-----------------|--------------|
|   | Digit           | Hand | Upper Extremity | Whole Person |
| Scapulothoracic (Forequarter)   | —               | —    | —               | 70           |
| Shoulder disarticulation  | —               | —    | 100             | 60           |
| Arm: deltoid insertion and proximally   | —               | —    | 100             | 60           |
| Arm/forearm: from distal to deltoid insertion to bicipital insertion                            | —               | —    | 95              | 57           |
| Forearm/hand: from distal to bicipital insertion to transmetacarpophalangeal loss of all digits | —               | —    | 94-90           | 56-54        |
| Hand: all digits at MP joints   | —               | 100  | 90              | 54           |
| Hand: all fingers at MP joints except thumb   | —               | 60   | 54              | 32           |
| Thumb ray at/or near:   |                 |      |                 |              |
| CMC joint   | —               | —    | 38              | 23           |
| Distal third of 1st metacarpal  | —               | —    | 37              | 22           |
| Thumbs at:  |                 |      |                 |              |
| MP joint  | 100             | 40   | 36              | 22           |
| IP joint  | 50              | 20   | 18              | 11           |
| Index or middle finger at:  |                 |      |                 |              |
| MP joint  | 100             | 20   | 18              | 11           |
| PIP joint   | 80              | 16   | 14              | 8            |
| DIP joint   | 45              | 9    | 8               | 5            |
| Ring or little finger at:   |                 |      |                 |              |
| MP joint  | 100             | 10   | 9               | 5            |
| PIP joint   | 80              | 8    | 7               | 4            |
| DIP joint   | 45              | 5    | 5               | 3            |



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## Summary

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- **Upper Extremities**
  - ▣ Values – UEI, Hand, Digit Impairment values
    - Rate WPI
  - ▣ Range of Motion, Peripheral Nerve, ‘Other Disorders’
- **AMA Guides**
  - ▣ Objective findings should lead to the correct Chapter, correct Table, and correct Class or Category
  - ▣ any knowledgeable observer may check the findings



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# Chapter 17 – The Lower Extremities Impairment Values

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more precise values allow more precise measures

- WPI - Whole Person Impairment
- LEI – Lower Extremity Impairment
  - ▣ 100% LEI = 40% WPI
- Foot Impairment
  - ▣ 100% Foot = 70% LEI



**Table 17-3** Whole Person Impairment Values Calculated From Lower Extremity Impairment

| % Impairment of Lower Extremity |                 | % Impairment of Lower Extremity |                 | % Impairment of Lower Extremity |                 |
|---------------------------------|-----------------|---------------------------------|-----------------|---------------------------------|-----------------|
| Whole Person                    | Lower Extremity | Whole Person                    | Lower Extremity | Whole Person                    | Lower Extremity |
| 0 = 0                           | 34 = 14         | 68 = 27                         |                 |                                 |                 |
| 1 = 0                           | 35 = 14         | 69 = 28                         |                 |                                 |                 |
| 2 = 1                           | 36 = 14         | 70 = 28                         |                 |                                 |                 |
| 3 = 1                           | 37 = 15         | 71 = 28                         |                 |                                 |                 |
| 4 = 2                           | 38 = 15         | 72 = 29                         |                 |                                 |                 |
| 5 = 2                           | 39 = 16         | 73 = 29                         |                 |                                 |                 |
| 6 = 2                           | 40 = 16         | 74 = 30                         |                 |                                 |                 |
| 7 = 3                           | 41 = 16         | 75 = 30                         |                 |                                 |                 |
| 8 = 3                           | 42 = 17         | 76 = 30                         |                 |                                 |                 |
| 9 = 4                           | 43 = 17         | 77 = 31                         |                 |                                 |                 |
| 10 = 4                          | 44 = 18         | 78 = 31                         |                 |                                 |                 |
| 11 = 4                          | 45 = 18         | 79 = 32                         |                 |                                 |                 |
| 12 = 5                          | 46 = 18         | 80 = 32                         |                 |                                 |                 |
| 13 = 5                          | 47 = 19         | 81 = 32                         |                 |                                 |                 |
| 14 = 6                          | 48 = 19         | 82 = 33                         |                 |                                 |                 |
| 15 = 6                          | 49 = 20         | 83 = 33                         |                 |                                 |                 |
| 16 = 6                          | 50 = 20         | 84 = 34                         |                 |                                 |                 |
| 17 = 7                          | 51 = 20         | 85 = 34                         |                 |                                 |                 |
| 18 = 7                          | 52 = 21         | 86 = 34                         |                 |                                 |                 |
| 19 = 8                          | 53 = 21         | 87 = 35                         |                 |                                 |                 |
| 20 = 8                          | 54 = 22         | 88 = 35                         |                 |                                 |                 |
| 21 = 8                          | 55 = 22         | 89 = 36                         |                 |                                 |                 |
| 22 = 9                          | 56 = 22         | 90 = 36                         |                 |                                 |                 |
| 23 = 9                          | 57 = 23         | 91 = 36                         |                 |                                 |                 |
| 24 = 10                         | 58 = 23         | 92 = 37                         |                 |                                 |                 |
| 25 = 10                         | 59 = 24         | 93 = 37                         |                 |                                 |                 |
| 26 = 10                         | 60 = 24         | 94 = 38                         |                 |                                 |                 |
| 27 = 11                         | 61 = 24         | 95 = 38                         |                 |                                 |                 |
| 28 = 11                         | 62 = 25         | 96 = 38                         |                 |                                 |                 |
| 29 = 12                         | 63 = 25         | 97 = 39                         |                 |                                 |                 |
| 30 = 12                         | 64 = 26         | 98 = 39                         |                 |                                 |                 |
| 31 = 12                         | 65 = 26         | 99 = 40                         |                 |                                 |                 |
| 32 = 13                         | 66 = 26         | 100 = 40                        |                 |                                 |                 |
| 33 = 13                         | 67 = 27         |                                 |                 |                                 |                 |

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**Table 17-2** Guide to the Appropriate Combination of Evaluation Methods

Open boxes indicate impairment ratings derived from these methods can be combined.

|                                       | Limb Length Discrepancy | Gait Derangement | Muscle Atrophy | Muscle Strength | ROM Ankylosis | Arthritis (DJD) | Amputation | Diagnosis-Based Estimates (DBE) | Skin Loss | Peripheral Nerve Injury | Complex Regional Pain Syndrome (CRPS) | Vascular |
|---------------------------------------|-------------------------|------------------|----------------|-----------------|---------------|-----------------|------------|---------------------------------|-----------|-------------------------|---------------------------------------|----------|
| Limb Length Discrepancy               |                         | X                |                |                 |               |                 | X          |                                 |           |                         |                                       |          |
| Gait Derangement                      | X                       |                  | X              | X               | X             | X               | X          | X                               | X         | X                       | X                                     | X        |
| Muscle Atrophy                        |                         | X                |                | X               | X             | X               | X          | X                               |           | X                       | X                                     |          |
| Muscle Strength                       |                         | X                | X              |                 | X             | X               |            | X                               |           | X                       | 0                                     |          |
| ROM Ankylosis                         |                         | X                | X              | X               |               | X               |            | X                               |           |                         | 0                                     |          |
| Arthritis (DJD)                       |                         | X                | X              | X               | X             |                 |            |                                 |           |                         |                                       |          |
| Amputation                            | X                       | X                | X              | X               |               |                 |            |                                 |           |                         |                                       |          |
| Diagnosis-Based Estimates (DBE)       |                         | X                | X              | X               | X             |                 |            |                                 |           |                         |                                       |          |
| Skin Loss                             |                         | X                |                |                 |               |                 |            |                                 |           |                         |                                       |          |
| Peripheral Nerve Injury               |                         | X                | X              | X               |               |                 |            |                                 |           |                         | X                                     |          |
| Complex Regional Pain Syndrome (CRPS) |                         | X                | X              | 0               | 0             |                 |            |                                 |           | X                       |                                       | X        |
| Vascular                              |                         | X                |                |                 |               |                 |            |                                 |           |                         | X                                     |          |

X = Do not use these methods together for evaluating a single impairment.

0 = See specific instructions for CRPS of the lower extremity.



When combining is allowed, combine at LEI value

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## The Lower Extremities

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### Methods of Evaluation

- Range of Motion
- Arthritis
- Diagnoses Based Estimates
  - Table 17-33

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## Range of Motion Method

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Use ROM only “If it is clear...restricted [ROM] has an organic basis...”

Obtain 3 measurements; use greatest (page 533)

Add ROM impairments in the same joint



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## Range of Motion Method

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- Active Motion - primarily
  - ▣ measured and evaluated
  - ▣ The Figures for Motion represent thresholds rather than values to interpolate

Flexion Contracture = loss of passive motion



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**Table 17-9 Hip Motion Impairment**

| Motion                 | Whole Person (Lower Extremity) Impairment (%) |                                |                            |
|------------------------|---|--------------------------------|----------------------------|
|                        | Mild<br>2% (5%)                               | Moderate<br>4% (10%)           | Severe<br>8% (20%)         |
| Flexion                | Less than 100°                                | Less than 80°                  | Less than 50°              |
| Extension              | 10°-19°<br>Flexion contracture                | 20°-29°<br>Flexion contracture | 30°<br>Flexion contracture |
| Internal rotation      | 10°-20°                                       | 0°-9°                          | —                          |
| External rotation      | 20°-30°                                       | 0°-19°                         | —                          |
| Abduction              | 15°-25°                                       | 5°-14°                         | Less than 5°               |
| Adduction              | 0°-15°  | —                              | —                          |
| Abduction contracture* | 0°-5°   | 6°-10°                         | 11°-20°                    |

**Table 17-11 Ankle Motion Impairment Estimates**

| Motion                     | Whole Person (Lower Extremity) [Foot] Impairment |                            |                           |
|----------------------------|--|----------------------------|---------------------------|
|                            | Mild<br>3% (7%) [10%]                            | Moderate<br>6% (15%) [21%] | Severe<br>12% (30%) [43%] |
| Plantar flexion capability | 11°-20°  | 1°-10°                     | None                      |
| Flexion contracture        | —  | 10°                        | 20°                       |
| Extension                  | 10°-0°<br>(neutral)                              | —                          | —                         |

**Table 17-10 Knee Impairment**

| Motion  | Whole Person (Lower Extremity) Impairment (%) |                      |  |
|---|---|----------------------|--|
|   | Mild<br>4% (10%)                              | Moderate<br>8% (20%) | Severe<br>14% (35%)                                    |
| Flexion   | Less than 110°                                | Less than 80°        | Less than 60° +<br>1% (2%) per<br>10° less than<br>60° |
| Flexion contracture   | 5°-9°   | 10°-19°              | 20°+   |
| Deformity measured by femoral-tibial angle; 3° to 10° valgus is considered normal |   |                      |  |
| Varus   | 2° valgus-0°<br>(neutral)                     | 1°-7° varus          | 8°-12° varus;<br>add 1% (2%)<br>per 2° over 12°        |
| Valgus  | 10°-12°                                       | 13°-15°              | 16°-20°; add<br>1% (2%) per<br>2° over 20°             |

**Flexion contracture vs extension lag**

**Table 17-12 Hindfoot Impairment Estimates**

| Motion    | Whole Person (Lower Extremity) [Foot] Impairment |                                     |
|-----------|--|-------------------------------------|
|           | Mild<br>1% (2%) [3%]                             | Moderate and Severe<br>2% (5%) [7%] |
| Inversion | 10°-20°  | 0°-9°                               |
| Eversion  | 0°-10°   | —                                   |

**Table 17-13 Ankle or Hindfoot Deformity Impairments**

| Position | Whole Person (Lower Extremity) [Foot] Impairment |                             |                           |
|----------|--|-----------------------------|---------------------------|
|          | Mild<br>5% (12%) [17%]                           | Moderate<br>10% (25%) [35%] | Severe<br>20% (50%) [72%] |
| Varus    | 10°-14°  | 15°-24°                     | 25°+                      |
| Valgus   | 10°-20°  | —                           | —                         |

**Table 17-14 Toe Impairments**

| Type of Impairment                                | Whole Person (Lower Extremity) [Foot] Impairment |                                     |
|---|--|-------------------------------------|
|   | Mild<br>1% (2%) [3%]                             | Moderate and Severe<br>2% (5%) [7%] |
| Great toe<br>Metatarsophalangeal,<br>extension    | 15°-30°  | Less than 15°                       |
| Interphalangeal, flexion                          | Less than 20°                                    | —                                   |
| Lesser toes*<br>Metatarsophalangeal,<br>extension | Less than 10°                                    | —                                   |

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## Arthritis

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Use x-rays (“standing if possible”) with Table 17-31 (page 544)

(x mm) = normal cartilage intervals

Compare uninjured opposite member (for causation and apportionment purposes)



## Table 17-31, p. 544

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**Table 17-31** Arthritis Impairments Based on Roentgenographically Determined Cartilage Intervals

| Joint                     | Whole Person (Lower Extremity) [Foot] Impairment (%) |             |             |              |
|---------------------------|--|-------------|-------------|--------------|
|                           | Cartilage Interval                                   |             |             |              |
|                           | 3 mm   | 2 mm        | 1 mm        | 0 mm         |
| Sacroiliac (3 mm)*        | —  | 1 ( 2)      | 3 ( 7)      | 3 ( 7)       |
| Hip (4 mm)                | 3 ( 7)   | 8 (20)      | 10 (25)     | 20 (50)      |
| Knee (4 mm)               | 3 ( 7)   | 8 (20)      | 10 (25)     | 20 (50)      |
| Patellofemoral†           | —  | 4 (10)      | 6 (15)      | 8 (20)       |
| Ankle (4 mm)              | 2 ( 5) [ 7]  | 6 (15) [21] | 8 (20) [28] | 12 (30) [43] |
| Subtalar (3 mm)           | —  | 2 ( 5) [ 7] | 6 (15) [21] | 10 (25) [35] |
| Talonavicular (2-3 mm)    | —  | —           | 4 (10) [14] | 8 (20) [28]  |
| Calcaneocuboid            | —  | —           | 4 (10) [14] | 8 (20) [28]  |
| First metatarsophalangeal | —  | —           | 2 ( 5) [ 7] | 5 (12) [17]  |
| Other metatarsophalangeal | —  | —           | 1 ( 2) [ 3] | 3 ( 7) [10]  |



## Arthritis – Example

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Medial Cartilage interval (knee) = 2 mm

Lateral Cartilage interval = 3 mm

Table 17-31 (p. 544)

“normal” = 4 mm

WPI – Medial space is worse (less remaining)

2 mm = 8% WPI (20% LE)

Patellofemoral loss can be combined (at LEI level)



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## Diagnosis-Based Estimates – Table 17-33

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(used in 70-80% of LE cases)

Covers 9 regions/conditions

- 1) Pelvis
- 2) Hip
- 3) Femoral Shaft Fracture
- 4) Knee
- 5) Malalignment of Tibial Shaft Fracture
- 6) Ankle
- 7) Hindfoot
- 8) Midfoot Deformity
- 9) Forefoot Deformity



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**Table 17-33** Impairment Estimates for Certain Lower Extremity Impairments

| Region and Condition  | Whole Person (Lower Extremity) [Foot] Impairment (%) | Region and Condition  | Whole Person (Lower Extremity) [Foot] Impairment (%) |
|---|--|---|--|
| <b>Pelvis*</b>  |  | <b>Knee</b>   |  |
| Pelvic fracture<br>Undisplaced, nonarticular, healed, without neurologic deficit or other sign      | 0  | Patellar subluxation or dislocation with residual instability   | 3 (7)  |
| Displaced nonarticular fracture: estimate by evaluating shortening and weakness                     | —  | Patellar fracture<br>Undisplaced, healed                        | 3 (7)  |
| Acetabular fracture: estimate according to range of motion and joint changes                        | —  | Articular surface displaced more than 3 mm                      | 5 (12)   |
| Sacroiliac joint fracture: consider displacement  | 1-3 (2-7)  | Displaced with nonunion   | 7 (17)   |
| Ichial bursitis (weaver's bottom) requiring frequent unweighting and limiting of sitting time       | 3 (7)  | Patellectomy<br>Partial   | 3 (7)  |
|   |  | Total   | 9 (22)   |
|   |  | Meniscectomy, medial or lateral<br>Partial                      | 1 (2)  |
|   |  | Total   | 3 (7)  |
| <b>Hip</b>  |  | Meniscectomy, medial and lateral<br>Partial                     | 4 (10)   |
| Total hip replacement; includes endoprosthesis, unipolar or bipolar                                 |  | Total   | 9 (22)   |
| Good results, 85-100 pointst  | 15 (37)  | Cruciate or collateral ligament laxity<br>Mild                  | 3 (7)  |
| Fair results, 50-84 pointst   | 20 (50)  | Moderate  | 7 (17)   |
| Poor results, less than 50 pointst  | 30 (75)  | Severe  | 10 (25)  |
| Femoral neck fracture, healed in Good position  | Evaluate according to examination findings           | Cruciate and collateral ligament laxity<br>Moderate             | 10 (25)  |
| Malunion  | 12 (30) plus range-of-motion criteria                | Severe  | 15 (37)  |
| Nonunion  | 15 (37) plus range-of-motion criteria                | Plateau fracture<br>Undisplaced                                 | 2 (5)  |
| Girdlestone arthroplasty<br>Or estimate according to examination findings; use the greater estimate | 20 (50)  | Displaced<br>5°-9° angulation                                   | 5 (12)   |
| Trochanteric bursitis (chronic) with abnormal gait  | 3 (7)  | 10°-19° angulation  | 10 (25)  |
|   |  | 20°+ angulation   | +1 (2) per degree up to 20 (50)                      |
| <b>Femoral shaft fracture</b>   |  | Supracondylar or intercondylar fracture<br>Undisplaced fracture | 2 (5)  |
| Healed with 10°-14° angulation or malrotation   | 10 (25)  | Displaced fracture  |  |
| 15°-19°   | 18 (45)  |   |  |

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| Region and Condition  | Whole Person (Lower Extremity) [Foot] Impairment (%)                    | Region and Condition  | Whole Person (Lower Extremity) [Foot] Impairment (%) |
|---|---|---|--|
| Total knee replacement including unicondylar replacement<br>Good result, 85-100 points† | 15 (37)   | Loss of tibia-to-calcis angles<br>Angle is 120°-110°                            | 5 (12) [17]  |
| Fair results, 50-84 points†   | 20 (50)   | Angle is 100°-90°   | 8 (20) [28]  |
| Poor results, less than 50 points†  | 30 (75)   | Angle is less than 90°  | +1 (2) [3] per degree up to 15 (37) [54]             |
| Proximal tibial osteotomy<br>Good result  | 10 (25)   | Intra-articular fracture with displacement<br>Subtalar bone                     | 6 (15) [21]  |
| Poor result   | Estimate impairment according to examination and arthritic degeneration | Talonavicular bone  | 3 (7) [10]   |
|   |   | Calcaneocuboid bone   | 3 (7) [10]   |
| <b>Tibial shaft fracture, malalignment of</b>   |   | <b>Midfoot deformity</b>  |  |
| 10°-14°   | 8 (20)  | Caus  |  |
| 15°-19°   | 12 (30)   | Mild  | 1 (2) [3]  |
| 20°+  | +1 (2) per degree up to 20 (50)   | Moderate  | 3 (7) [10]   |
|   |   | "Rocker bottom"<br>Mild   | 2 (5) [7]  |
| <b>Ankle</b>  |   | Moderate  | 4 (10) [14]  |
| Ligamentous instability (based on stress x-rays)<br>Mild (2-3 mm excess opening)        | 2 (5) [7]   | Severe  | 8 (20) [28]  |
| Moderate (4-6 mm)   | 4 (10) [14]   | Avascular necrosis of the talus<br>Without collapse                             | 3 (7) [10]   |
| Severe (> 6 mm)   | 6 (15) [21]   | With collapse   | 6 (15) [21]  |
| Fracture<br>Extra-articular with angulation   |   | <b>Forefoot deformity</b>   |  |
| 10°-14°   | 6 (15) [21]   | Metatarsal fracture with loss of weight transfer<br>1st metatarsal              | 4 (10) [14]  |
| 15°-19°   | 10 (25) [35]  | 5th metatarsal  | 2 (5) [7]  |
| 20°+  | +1 (2) [3] per degree up to 15 (37) [53]                                | Other metatarsal  | 1 (2) [3]  |
| Intra-articular with displacement   | 8 (20) [28]   | Metatarsal fracture with plantar angulation and metatarsalgia<br>1st metatarsal | 4 (10) [14]  |
| <b>Hindfoot</b>   |   | 5th metatarsal  | 2 (5) [7]  |
| Fracture<br>Extra-articular (calcaneal)   |   | Other metatarsal  | 1 (2) [3]  |
| With varus angulation<br>10°-19°  | 5 (12) [17]   |   |  |
| With varus angulation 20°+  | 0.5 (1) [1] per degree up to 10 (25)                                    |   |  |
| With valgus angulation<br>10°-19°   | 3 (7) [11]  |   |  |
| With valgus angulation 20°+   | 0.5 (2) [1] per degree up to 10 (25) [35]                               |   |  |

## Hip and Knee Replacements require the use of 2 Tables

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### Hip Replacement:

Table 17-34 and 17-33 (p. 548, 546-547)

### Knee Replacement:

Table 17-35 and 17-33 (p. 549, 546-547)

### All others:

Table 17-33 (p. 546-547)



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**Table 17-35 Rating Knee Replacement Results\***

|   | Number of Points    |
|---|---------------------|
| <b>a. Pain</b>  |                     |
| None  | 50                  |
| Mild or occasional<br>Stairs only                           | 45                  |
| Walking and stairs  | 40                  |
| Moderate<br>Occasional<br>Continual                         | 20                  |
| Severe  | 0                   |
| <b>b. Range of Motion</b>                                   |                     |
| Add 1 point per 5°  | 25                  |
| <b>c. Stability</b><br>(irregular movement in any position) |                     |
| Anteroposterior   |                     |
| < 5 mm  | 10                  |
| 5-9 mm  | 5                   |
| > 9 mm  | 0                   |
| Mediolateral  |                     |
| 5°  | 15                  |
| 6°-9°   | 10                  |
| 10°-14°   | 5                   |
| > 15°   | 0                   |
| Subtotal  |                     |
| <b>Deductions (minus) d, e, f</b>                           |                     |
| <b>d. Flexion contracture</b>                               |                     |
| 5°-9°   | 2                   |
| 10°-15°   | 5                   |
| 16°-20°   | 10                  |
| > 20°   | 20                  |
| <b>e. Extension lag</b>                                     |                     |
| < 10°   | 5                   |
| 10°-20°   | 10                  |
| > 20°   | 15                  |
| <b>f. Alignment</b>   |                     |
| 0°- 4°  | 0                   |
| 5°-10°  | 3 points per degree |
| 11°-15°   | 2 points per degree |
| > 15°   | 20                  |
| Deductions subtotal   |                     |
| —   |                     |

\* The point total for estimating knee replacement results is the sum of the points in categories a, b, and c, minus the sum of the points in categories d, e, and f. Modified from Insall JN, Dorr LD, Scott RD: Results of the Knee Society clinical rating system. Clin Orthop. 1989;248:14.

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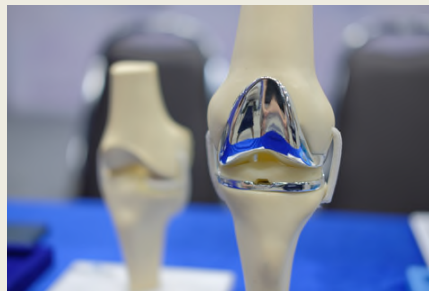
## Total Hip and/or Knee Replacement

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Good Results, 85-100 pts. 15% WPI (37 LE)

Fair Results, 50-84 pts. 20% WPI (50 LE)

Poor Results, less than 50 pts. 30% WPI (75 LE)



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## Gait Derangement

Table 17-5, p. 529

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**Table 17-5 Lower Limb Impairment Due to Gait Derangement**

| Severity | Individual's Signs   | Whole Person Impairment |
|----------|--|-------------------------|
| Mild     | a. Antalgic limp with shortened stance phase and documented moderate to advanced arthritic changes of hip, knee, or ankle                                  | 7%                      |
|          | b. Positive Trendelenburg sign and moderate to advanced osteoarthritis of hip  | 10%                     |
|          | c. Same as category a or b above, but individual requires part-time use of cane or crutch for distance walking but not usually at home or in the workplace | 15%                     |
|          | d. Requires routine use of short leg brace (ankle-foot orthosis [AFO])   | 15%                     |
| Moderate | e. Requires routine use of cane, crutch, or long leg brace (knee-ankle-foot orthosis [KAFO])   | 20%                     |
|          | f. Requires routine use of cane or crutch and a short leg brace (AFO)  | 30%                     |
|          | g. Requires routine use of two canes or two crutches   | 40%                     |
| Severe   | h. Requires routine use of two canes or two crutches and a short leg brace (AFO)   | 50%                     |
|          | i. Requires routine use of two canes or two crutches and a long leg brace (KAFO)   | 60%                     |
|          | j. Requires routine use of two canes or two crutches and two lower-extremity braces (either AFOs or KAFOs)   | 70%                     |
|          | k. Wheelchair dependent  | 80%                     |



## Gait Derangement

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*“Whenever possible, the evaluator should use a more specific method. ..The **lower limb impairment percents shown in Table 17-5 stand alone and are not combined with any other impairment evaluation method.**”*

Within Example 17-1 on page 528 of the AMA Guides,

*“Although the individual has a limp (gait abnormality), **gait derangement should be used only when no other method is available to rate the person.**”*



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## Maximum WPI Values Table 17-32

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**Table 17-32** Impairment Estimates for Amputations

| Amputation                                  | Whole Person (Lower Extremity) [Foot] Impairment (%) |
|---|--|
| Hemipelvectomy                              | 50   |
| Hip disarticulation                         | 40 (100)   |
| Above knee                                  |  |
| Proximal                                    | 40 (100)   |
| Mid thigh                                   | 36 (90)  |
| Distal                                      | 32 (80)  |
| Knee disarticulation                        | 32 (80)  |
| Below knee                                  |  |
| Less than 3"                                | 32 (80)  |
| 3" or more                                  | 28 (70)  |
| Syme (hindfoot)                             | 25 (62) [100]  |
| Midfoot                                     | 18 (45) [64]   |
| Transmetatarsal                             | 16 (40) [57]   |
| First metatarsal                            | 8 (20) [28]  |
| Other metatarsals                           | 2 ( 5) [ 7]  |
| All toes at metatarsophalangeal (MTP) joint | 9 (22) [31]  |
| Great toe at MTP joint                      | 5 (12) [17]  |
| Great toe at interphalangeal joint          | 2 ( 5) [ 7]  |
| Lesser toes at MTP joint                    | 1 ( 2) [ 3] each                                     |



## Summary

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### Lower Extremities

- ▣ Values – LEI, Foot Impairment values
  - Rate WPI
- ▣ Range of Motion; Arthritis; DBE Methods

### AMA Guides

- ▣ Objective findings should lead to the correct Chapter, correct Table, and correct Class or Category
- ▣ any knowledgeable observer may check the findings





## Chapter 13 - The Central and Peripheral Nervous System

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**Table 13-15** Criteria for Rating Impairments Due to Station and Gait Disorders

| Class 1<br>1%-9% Impairment of the Whole Person  | Class 2<br>10%-19% Impairment of the Whole Person  | Class 3<br>20%-39% Impairment of the Whole Person                                     | Class 4<br>40%-60% Impairment of the Whole Person                         |
|--|--|---|---|
| Rises to standing position; walks, but has difficulty with elevations, grades, stairs, deep chairs, and long distances | Rises to standing position; walks some distance with difficulty and without assistance, but is limited to level surfaces | Rises and maintains standing position with difficulty; cannot walk without assistance | Cannot stand without help, mechanical support, and/or an assistive device |

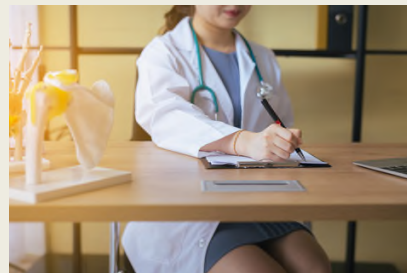
**Table 13-16** Criteria for Rating Impairment of One Upper Extremity

| Class 1   |   | Class 2   |   | Class 3  |  | Class 4  |  |
|---|---|---|---|--|--|--|--|
| Dominant Extremity<br>1%-9%<br>Impairment<br>of the Whole<br>Person   | Nondominant Extremity<br>1%-4%<br>Impairment<br>of the Whole<br>Person  | Dominant Extremity<br>10%-24%<br>Impairment<br>of the Whole<br>Person   | Nondominant Extremity<br>5%-14%<br>Impairment<br>of the Whole<br>Person   | Dominant Extremity<br>25%-39%<br>Impairment<br>of the Whole<br>Person                  | Nondominant Extremity<br>15%-29%<br>Impairment<br>of the Whole<br>Person               | Dominant Extremity<br>40%-60%<br>Impairment<br>of the Whole<br>Person          | Nondominant Extremity<br>30%-45%<br>Impairment<br>of the Whole<br>Person       |
| Individual can use the involved extremity for self-care, daily activities, and holding, but has difficulty with digital dexterity | Individual can use the involved extremity for self-care, daily activities, and holding, but has difficulty with digital dexterity | Individual can use the involved extremity for self-care, can grasp and hold objects with difficulty, but has no digital dexterity | Individual can use the involved extremity for self-care, can grasp and hold objects with difficulty, but has no digital dexterity | Individual can use the involved extremity but has difficulty with self-care activities | Individual can use the involved extremity but has difficulty with self-care activities | Individual cannot use the involved extremity for self-care or daily activities | Individual cannot use the involved extremity for self-care or daily activities |

## Review WPI Reporting

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- Does the doctor explain the WPI?
- Read the relevant part of the Guides
  - Introduction to that Chapter
  - Applicable section
  - Applicable Tables/Figures
  - Examples



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## Guzman

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- Guzman
  - ▣ WCAB en banc decision “affirmed”
  - ▣ **requires application of the Guides as written, including the instructions on its proper use.**
  - ▣ **by resorting to comparable conditions described in the Guides**
- The burden rests with the party disputing the Guides.
- Adequate evidence and reasoning.
- Ogilvie, Dahl, Fitzpatrick, Applied Materials et al, and Guzman Appellate decisions
- “a claimant’s scheduled rating is presumptively correct” (Contra Costa County v WCAB and Dahl).
- Almaraz/Guzman and ‘Kite’ are not automatic



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## Paying PD Benefits

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- $PD \% = \text{number of weeks} \times \text{weekly PD Rate}$ 
  - ▣ Date of injury
  - ▣ PD %
  - ▣ AWE and statutory maximums and minimums
- When does PD accrue?
- When should PD be paid?
- How much should be paid?



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# Summary

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- 2005 PDRS and AMA Guides
- AMA Guides (non-jurisdictional specific) = WPI
- WPI based primarily on objective medical data
- PDRS (California specific) = instruction for adjusting WPI to PD (Nature of injury, FEC, occupation, age)



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