

# Rating Boot Camp: Upper Extremities

From Basic Training to Advanced....

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## Basic Upper Extremity Impairment Rating Methods

- Range of motion
- Amputation
- Peripheral Nerve
- Muscle Strength testing
- Digit sensory loss
- Arthroplasty
- Joint instability
- CRPS
- Grip

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# Adding vs. Combining

What do the AMA Guides say?

- “In general, impairment ratings within the same region are combined before combining the regional impairment rating with that from another region.” (per page 10)
- The AMA Guides state that the regional impairments resulting from the hand, wrist, elbow and shoulder regions are *added* or *combined* to provide the upper extremity impairment. The upper extremity is then converted to whole person impairment by means of Table 16-3.

# Combined Values Chart

- CVC is how disabilities are combined
- Residual chart A + B (1-A)
- Compaction increases with larger numbers
- Difficult to reach 100%



## When are Impairments Added

- ROM values within a single joint
- Impairment values of all thumb joint motions
- Hand impairment values contributed by each digit
- Muscle strength impairments within an upper extremity joint (Table 16-35)
- When there is thumb amputation proximal to MP joint

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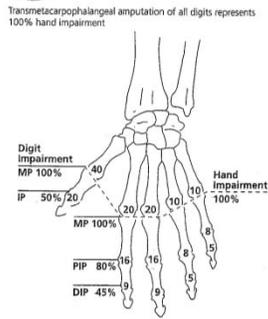
## PDRS Rules of Combining

- Multiple impairments in a single part of an extremity are combined at UE index
- Impairments in the 16.01 series are adjusted to disability before being combined with other disabilities
- PD for an entire arm is calculated before being combined with other body parts
- The combined rating for an arm may not exceed amputation after adjustment

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# Digit Values vs. Hand

**Figure 16-3** Impairments of the Digits (values outside digits) and the Hand (values inside digits) for Amputations at Various Levels



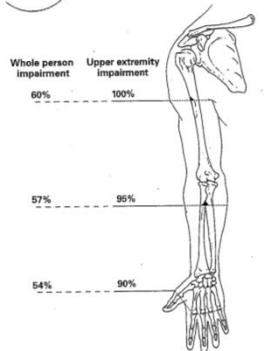
## Digit Values

- Thumb 40%
- Index 20%
- Middle 20%
- Ring 10%
- Little 10%
- Hand 100%

MP = metacarpophalangeal  
 PIP = proximal interphalangeal  
 DIP = distal interphalangeal  
Reprinted with permission from Swanson AB. Evaluation of impairment of function in the hand. Surg Clin North Am. 1964;44:923-940.

# Upper Extremity Values vs. WPI

**Figure 16-2** Impairment Estimates for Upper Extremity Amputation at Various Levels



## Upper Extremity Values

- Hand 90% of Arm  
 - .9 modifier
- Arm 60% of Body  
 - .6 modifier

Reprinted with permission from Swanson AB. Evaluation of impairment of function in the hand. Surg Clin North Am. 1964;44:923-940.

# Useful Tool – Figure 16-1a and 16-1b

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Figure 16-1a Upper Extremity Impairment (Anatomical Basis) Part 1 (Hand)

Age: No. CMZ (2) Treatment level (2) (3) Sex: M

Occupation: Butcher

Abnormal Motion	Abnormal Motion		Other	Regional Impairment %	Anatomical Basis Impairment %
	Flexion/Extension	Abduction/Adduction			
Wrist	Flexion/Extension	Abduction/Adduction	Wrist	10	10
Hand	Flexion/Extension	Abduction/Adduction	Hand	12	12
Forearm	Flexion/Extension	Abduction/Adduction	Forearm	0	0
Elbow	Flexion/Extension	Abduction/Adduction	Elbow	0	0
Shoulder	Flexion/Extension	Abduction/Adduction	Shoulder	0	0

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Figure 16-1b Upper Extremity Impairment (Anatomical Basis) Part 2 (Wrist, Elbow, and Shoulder)

Age: No. CMZ (2) Treatment level (2) (3) Sex: M

Occupation: Butcher

Abnormal Motion	Abnormal Motion		Other	Regional Impairment %	Anatomical Basis Impairment %
	Flexion/Extension	Abduction/Adduction			
Wrist	Flexion/Extension	Abduction/Adduction	Wrist	10	10
Hand	Flexion/Extension	Abduction/Adduction	Hand	12	12
Forearm	Flexion/Extension	Abduction/Adduction	Forearm	0	0
Elbow	Flexion/Extension	Abduction/Adduction	Elbow	0	0
Shoulder	Flexion/Extension	Abduction/Adduction	Shoulder	0	0

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## Problem #1

A 36 year old Butcher at ABC Meats slips and fractures left wrist.

Physician provides impairment rating based on decreased wrist motion and grip loss

Wrist = 10 WP

Grip = 12 WP



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## Factors of Impairment

- Wrist ROM
  - Dorsal 20 degrees
  - Palmar 30 degrees
  - Radial 10 degrees
  - Ulnar 10 degrees
- 
- Grip measurements
  - Left 15/15/20
  - Right 30/30/35



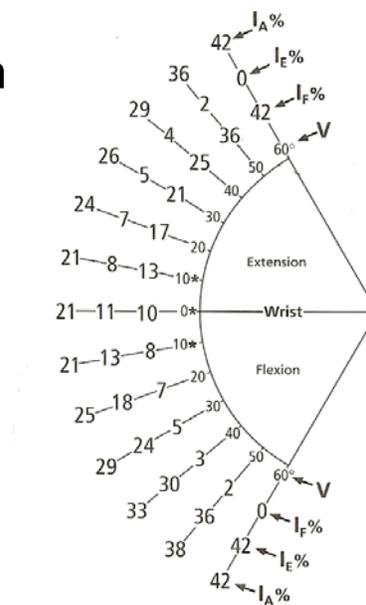
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## Wrist ROM Flexion and Extension

Figure 16-28, p. 467

20° Extension

30° Flexion

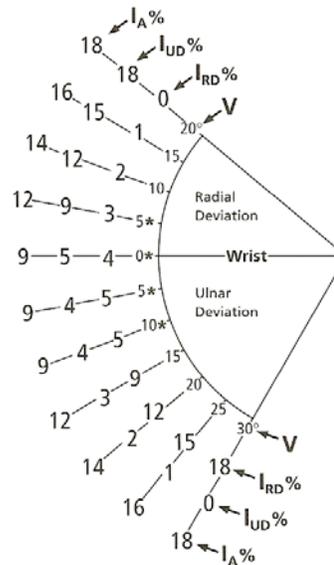


## Wrist ROM Radial and Ulnar Deviation

Figure 16-31, p. 469

10° Radial Deviation

10° Ulnar Deviation



## Wrist ROM Impairment

- Wrist ROM
- Dorsal 20 degrees = 7 UE
- Palmar 30 degrees = 5 UE
- Radial 10 degrees = 2 UE
- Ulnar 10 degrees = 4 UE
- Total = 18 UE x .6 = 11 WP

Left Wrist ROM

16.04.01.00 – 11 – [4]14 – 322G – 16 – 15 PD

## Grip Loss Impairment

- Injured Left  $15/15/20 = 50/3 = 16.7$
- Right  $30/30/35 = 95/3 = 31.7$
- Formula = (Normal – Injured)/ Normal
- $31.7 - 16.7 = 15/31.7 = 47.3\% = 20 \text{ UE} = 12 \text{ WP}$



Left Grip

16.01.04.00 – 12 – [4]15 – 322G – 17 – 16 PD

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Table 16-34  
Grip Loss

% Strength Loss	Upper Extremity Impairment
10-30	10
31-60	20
61-100	30

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## Estimating Normal Grip

### Physician Options

- Use opposite extremity as normal
- Use Tables 16-31 and 16-32 (population averages)
- Estimate normal

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## Hand Dominance

- Hand dominance is difficult to objectively measure and is not accounted for in these impairment ratings.
- Exceptions to the rule...
  - ❖ Chapter 16: Grip loss Tables 16-31, 16-32 are used if both extremities are involved to compare to the average normal strengths.
  - ❖ Chapter 13: Central and Peripheral Nervous System, Table 13-16 for lesions of the brain and Table 13-22 for CRPS.

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## Consultative Rating

L Wrist ROM S: 20-0-30 F: 10-0-10: 18 UE = 11 WP  
16.04.01.00 – 11 – [4]14 – 322G – 16 – 15 PD

L Grip Loss 47% = 20 UE = 12 WP  
16.01.04.00 – 12 – [4]15 – 322G – 17 – 16 PD

16 C 15 = 29 Final PD

Grip cannot be rated in the presence of decreased motion that prevents maximum application of force.

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## When Grip Cannot be Rated

Cannot be rated if maximum strength prevented by

- Decreased motion
- Pain
- Amputation

Cannot be rated for:

- Peripheral nerve injuries
- CRPS injuries
- Grip impairment for elbow and shoulder injuries

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## Key to Grip Impairment

- Ask physician
- Cause of strength loss
- Then ask if AMA Guides page 508 preclusions apply



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## Problem #1

What if the date of injury was in 2014?

- *As a result of SB 863, LC 4660.1 removes the Future Earning Capacity adjustments [1-8] with the modifier of [1.4].*

L Wrist ROM

16.04.01.00 – 11 – [1.4]15 – 322G – 17 – 16 PD

L Grip Loss

16.01.04.00 – 12 – [1.4]17 – 322G – 19 – 18 PD

18 C 16 = 31 Final PD

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## Problem #2

Occupation: Baseball Pitcher

Age: 22 years

Rotator cuff tear in right shoulder. Injured underwent rotator cuff repair with distal clavicle arthroplasty.



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## Problem #2

Physician rated the following impairments:

25% strength deficit for all units of shoulder motion except internal and external rotation which he gave a 10% strength deficit.

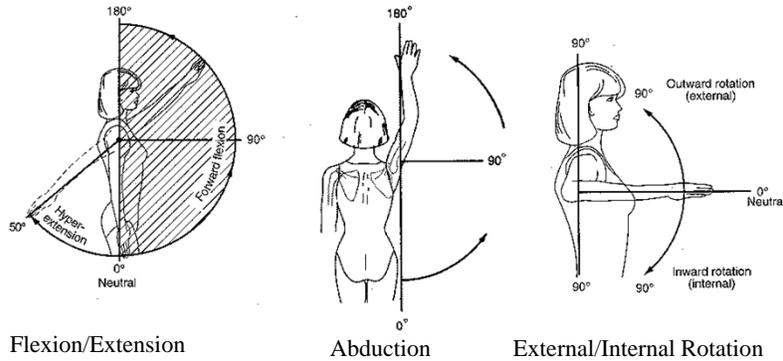
R Shoulder ROM

S: 20-0-120 F: 110-0-40 R: 50-0-30

Pain: 3 WP

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# Shoulder Motions



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**Table 16-35** Impairment of the Upper Extremity Due to Strength Deficit From Musculoskeletal Disorders Based on Manual Muscle Testing of Individual Units of Motion of the Shoulder and Elbow

Joint Relative Value	Unit of Motion Relative Value	% Upper Extremity Impairment	
		Strength Deficit*	
		5%-25% <sup>†</sup>	30%-50% <sup>‡</sup>
<b>Shoulder (60%)</b>			
Flexion	24	1-6	7-12
Extension	6	0-2	2- 3
Abduction	12	1-3	4- 6
Adduction	6	0-2	2- 3
Internal rotation	6	0-2	2- 3
External rotation	6	0-2	2- 3
<b>Elbow (70%)</b>			
Flexion	21	1-5	6-11
Extension	21	1-5	6-11
Pronation	14	1-4	4- 7
Supination	14	1-4	4- 7

\* Use clinical judgment to select the appropriate percentage from the range of values shown for each severity grade.

<sup>†</sup> Complete range of motion against gravity only without resistance.

<sup>‡</sup> Complete range of motion against gravity with some resistance.

Derived from Section 16.4 and Table 16-11 by G. de Groot Swanson, Grand Rapids, Michigan.

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## Problem #2

### Calculating shoulder strength deficit

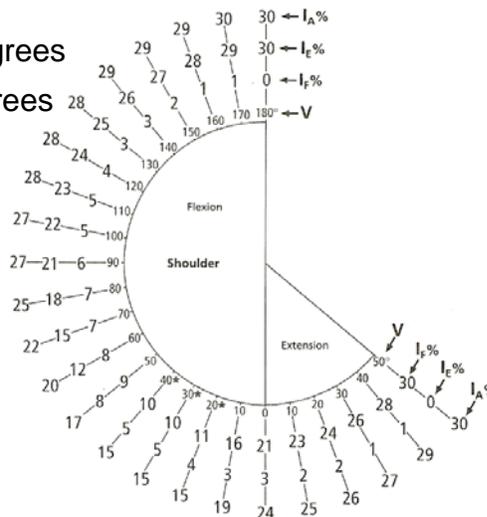
Flexion	Max value 24	x	25%	=	6 UE
Extension	Max value 6	x	25%	=	2 UE
Abduction	Max value 12	x	25%	=	3 UE
Adduction	Max value 6	x	25%	=	2 UE
Int Rotate	Max value 6	x	10%	=	1 UE
Ext Rotate	Max value 6	x	10%	=	<u>1 UE</u>
Total					15 UE

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## Shoulder ROM

Extension 20 degrees

Flexion 120 degrees



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## Problem #2

### Calculating shoulder ROM deficit

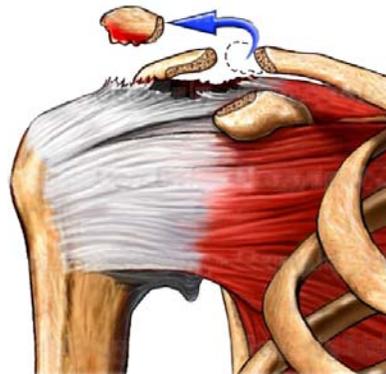
Flexion	=	4 UE
Extension	=	2 UE
Abduction	=	3 UE
Adduction	=	0 UE
Int Rotate	=	4 UE
Ext Rotate	=	<u>1 UE</u>
Total		14 UE



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## Distal Clavicle Arthroplasty

- Most common
- Resection
- 10 Upper Extremity Impairment per Table 16-27



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## An Arthroplasty by Any Other Name

### Is Still 10 UE

- Distal clavicle arthroplasty
- Mumford procedure
- Distal clavicle resection
- Distal clavicle excision



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## Pain Add-On

### PDRS Page 1-12

- *“Pursuant to Chapter 18 of the AMA Guides, a whole person impairment rating based on the body or organ rating system of the AMA Guides (Chapters 3 through 17) may be increased by 0% up to 3% WPI if the burden of the worker’s condition has been increased by pain-related impairment in excess of the pain component already incorporated in the WPI rating in Chapters 3-17. (AMA Guides, p. 573.)*

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## Pain Add-on



- Maximum 3 WP
- AMA impairments account for common pain
- Must increase burden in excess of pain component already incorporated

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## DEU Approach to Pain



- 3 WP maximum for pain
- Add-on to ratable impairment only
- Will assign pain to body part if physician does not

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## DEU Consultative Rating

Shoulder ROM S: 20-0-120 F: 110-0-40 R: 50-0-30: 14 UE

Shoulder muscle strength: 15 UE

Distal clavicle arthroplasty: 10 UE (corrected)

$15\ C\ 14\ C\ 10 = 34\ UE \times .6 = 20\ WP$

16.02.02.00 – 23 – [1.4]32 – 590J – 44 – 38 Final PD

3 WP add-on included for pain

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## DEU Consultative Rating Annotations

- Strength impairment cannot be rated in the presence of decreased motion or pain that prevents maximum application of force
- Strength cannot be combined with other impairments unless due to different etiologic or pathomechanical cause.
- Distal clavicle athroplasty not included in physician impairments

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## Muscle Strength Impairment

- Cannot be combined with other impairments unless due to different

- Etiologic cause
- Patho-mechanical cause



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## Problem #3

Secretary, 42 years old, undergoes carpal tunnel release.

Physician impairments:

Median nerve 25% sensory deficit

Median nerve 25% motor deficit



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## Calculating Peripheral Nerve Impairment

1. Find the nerve involved
2. Find maximum sensory and motor deficits  
(Table 16-15)
3. Doctor determines percentage of sensory and motor deficits

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## Calculating Peripheral Nerve Impairment

4. Multiply maximum sensory nerve value by percentage of deficit
5. Multiply maximum motor nerve value by percentage of deficit
6. Combine sensory and motor nerve impairment.
7. Convert to WP and adjust for disability

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## Identify Nerve Find Maximum Deficits

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

Nerve	Maximum % Upper Extremity Impairment Due to:	
	Sensory Deficit or Pain *	Motor Deficit
Pectorals (medial and lateral)	0	5
Axillary	5	35
Dorsal scapular	0	5
Long thoracic	0	15
Medial antebrachial cutaneous	5	0
Medial brachial cutaneous	5	0
Median (above midforearm)	39	44
Median (anterior interosseous branch)	0	15
Median (below midforearm)	39	10
Radial palmar digital of thumb	7	0
Ulnar palmar digital of thumb	11	0
Radial palmar digital of index finger	5	0
Ulnar palmar digital of index finger	4	0
Radial palmar digital of middle finger	5	0
Ulnar palmar digital of middle finger	4	0
Radial palmar digital of ring finger	3	0
Musculocutaneous	5	25
Radial (upper arm with loss of triceps)	5	42
Radial (elbow with sparing of triceps)	5	35



## Calculate Sensory Impairment

Max sensory value	Percent deficit found by doctor	Actual sensory value
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$$39 \text{ UE} \times 25\% = 10 \text{ UE}$$

## Calculate Motor Value Impairment

Max motor value	Percent deficit found by doctor	Actual motor value
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$$10 \text{ UE} \times 25\% = 3 \text{ UE}$$

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## Problem #3

Combine motor and sensory impairments  
and convert to WP

$$10 \text{ C } 3 = 13 \text{ UE} \times .6 = 8 \text{ WP}$$

Adjust to PD

$$16.01.02.02 - 8 - [4]10 - 112H - 13 - 14 \text{ PD}$$

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