

UPPER EXTREMITY IMPAIRMENT

OBJECTIVES FOR THE UPPER EXTREMITY SECTION

1. Show how the impairment levels of the upper extremity at the hand and forearm compare to the extremity as a whole and the whole body.
2. Explain the method for determining sensory loss of the fingers.
3. Explain the manner used to determine range of motion in all joints of the fingers.
4. Demonstrate the ability to determine impairment ratings for a finger and the thumb using all measurements for impairment.
5. Determine range of motion impairments for the wrist, elbow, and shoulder, given specific values in all planes.
6. Apply Table 16 - Impairment of the Upper Extremity due to Peripheral Vascular Disease - correctly to a case scenario.
7. Demonstrate understanding of the available tables on peripheral nerves.
8. Apply tables found in section 3.1J under Impairment Due to other Disorders of the Upper Extremity correctly to determine an impairment rating.
9. Using a clinical case scenario, combine the impairment ratings for range of motion of several joints in the upper extremity, as well as other deficits, to determine the upper extremity and whole body rating.
10. Correctly complete the report form found on pages 12 and 13.

UPPER EXTREMITY IMPAIRMENT

General Principles

Upper extremity impairment is viewed as some percentage of a complete amputation of the arm.

Figure 2, p.15 shows complete amputation of the arm as a 60% impairment of the whole person. Amputation of all digits is equivalent to a 90% impairment of the upper extremity and a 54% impairment of the whole person.

Any combination of types of injury or permanent impairment that add or combine to more than 100% of the upper extremity is equal to 100% of that upper extremity. This is the same principle used in other sections of the Guides.

Injury residuals of the various parts of the upper extremity are rated as follows:

- Rated at digit level.
- Digit or digits converted to hand level - Table 1, p.15
- Hand level converted to upper extremity level - Table 2, p.16
- All upper extremity ratings are combined in order from distal to proximal to determine total upper extremity rating.
- Upper extremity rating converted to whole person ratings - Table 3, p.16
- Each upper extremity is rated as whole person separately and both ratings are combined for final whole person rating when impairment is bilateral.
- Impairments of same kind or type - usually added (exceptions exist).
- Impairments of more than 1 type - combined.

Categories of upper extremity impairment:

- Amputation
- Sensory loss of digits
- Abnormal motion
- Peripheral neurological losses (Motor & Sensory)
- Vascular disorders

- OTHERS: joint crepitation, joint swelling, deviation, subluxation and dislocation, arthroplasty, carpal instability, muscle and tendons, and strength loss.

Note: Often, the elements included in "other" may be part of the 5 major types of impairment.

They are separately rated only when that particular "other" problem either lends more impairment than is included with the major five categories or does not cause any of the other five types of impairment but acts to impair function, e.g., finger may have full motion and no sensory loss but with joint crepitation, swelling, deviation, subluxation or dislocation.

Also, muscle tightness and arthroplasty and loss of strength are sometimes themselves an impairment even with normal range of motion and sensation.

A CAUTIONARY WORD ABOUT SOME TABLES AND FIGURES

There are several figures and tables or portions of figures and tables in the upper extremity chapter of the *AMA Guides* Third Edition, Revised that are in the text for explanatory reasons only. Because they can be confusing and mistakenly applied when one is performing a rating, we recommend that you cross them out in your book. These include:

Figure 3, Page 15

Figure 5, Page 17

Figure 7, Page 19 - Omit Total Transverse Sensory Loss Impairment % section only

Figure 9, Page 21

Figure 12, Page 22

Figure 14, Page 22

Table 5, Page 23 - Do not use Lost and Retained columns

Table 6, Page 23 - Do not use Lost and Retained columns

Figure 16, Page 24

Table 7, Page 24 - Do not use Lost and Retained columns

Figure 17, Page 25- Omit Total Transverse Sensory Loss Impairment % section only

Figure 25, Page 29

Figure 28, Page 30

Figure 31, Page 32

Figure 34, Page 33

Figure 37, Page 35

Figure 40, Page 36

Figure 43, Page 37

DIGITAL IMPAIRMENTS

Amputation of the digits

The impairment percentage of each amputated digit can be determined by using the appropriate figures.

Fig. 7, p.19 - thumb

Fig. 17, p.25 - other digits

Sensory loss of the digits

Sensory quality Classification

- 2 point discrimination greater than 15mm
= total sensory loss or 100%
- 2 point discrimination between 15-7mm
= partial sensory loss or 50% sensory impairment
- 2 point discrimination equal to or less than 6mm
= normal sensibility or 0%

Distribution of impairment

Digital sensory impairment is calculated as a percentage of the length of the digit involved and the grade of sensory loss.

Table 4, p.20 - gives values for sensory loss of the thumb and little finger.

Table 8, p.25 - gives values for the sensory loss of the index, middle and ring finger.

Range of Motion

Thumb

Flexion extension interphalangeal joint, Fig. 10, p.21

Flexion extension metacarpophalangeal joint, Fig. 13, p.22

Adduction, Table 5, p.23

Abduction, Table 6, p.23

Opposition, Table 7, p.24

Add all range of motion deficits of the thumb

Other digits

Flexion extension distal interphalangeal joint, Fig 19, p.26

Flexion extension proximal interphalangeal joint, Fig. 21, p.27

Flexion extension metacarpophalangeal joint, Fig. 23, p.28

Add range of motion deficits at each joint level, e.g., flexion deficit and extension deficit of the pip joint.

Combine, do not add, range of motion deficits from all involved joints on the digit. All digits except the thumb.

Total Digit Impairment

Combine deficits from amputation, sensation, range of motion and any other applicable disorders for each digit .

Multiple Digit Involvement

Translate each digit's total impairment to the hand impairment using Table 1, p.15.

Add all of the hand's impairment from each digit to determine the total hand impairment.

WRIST

Amputation

Use Fig. 2, p.15

An amputation at the wrist level is a 92% impairment of the upper extremity.

Range of Motion

Flexion extension, Fig. 26, p.29

Ulnar and radial deviation, Fig. 29, p.31

Add range of motion deficits.

ELBOW

Amputation

Use Fig. 2, p.15

An amputation at the elbow joint is a 96% impairment of the upper extremity.

Range of Motion

Flexion extension, Fig. 32, p.32

Pronation supination, Fig. 35, p.33

Add range of motion values for total ROM deficit.

SHOULDER

Amputation at shoulder equals 100% impairment of upper extremity.

Range of Motion

Flexion extension, Fig. 38, p.35

Abduction-adduction, Fig. 41, p.36

Internal-external rotation, Fig. 44, p.37

Add range of motion deficits from each function.

PERIPHERAL NERVE DISORDERS

Determined as described in Neurological Section.

Nerves found on:

Table 14, p.46, Specific unilateral nerves

Table 13, p.44, Brachial plexus

Table 12, p.43, C₅-T₁, nerve roots

Sensory grading, Table 10, p.42

Motor grading, Table 11, p.42

Note: Loss of strength from any non-neurological cause may be graded according to grip and lateral pinch strength. However, a patient cannot be given a rating for a motor disorder due to a neurological cause under Table 11 and also receive a grip strength rating.

IMPAIRMENT DUE TO VASCULAR DISORDERS

Rate according to Table 16, p.47

These values are combined with other upper extremity impairments.

OTHER DISORDERS OF THE UPPER EXTREMITY

These tables must only be used when other measures of impairment have not adequately addressed the patient's impairment.

Joint Crepitation

May reflect synovitis or cartilage degeneration.

Use percentage joint impairment on p.48 and multiply by the applicable joint, Table 17, p.48

Joint Swelling due to Synovial Hypertrophy without range of motion deficits

Use impairments on p. 48 and again multiply by joint value Table 17.

Digital Lateral Deviation or Rotational Deformity

Lateral deviation and rotational deviation are found on page 49.

These values are multiplied by the total value of the digit (see Table 17, p.48)

If other impairments are present combine this value with them.

Persistent Joint Subluxation and Dislocation without range of motion deficits.

Multiply appropriate value on p.49 by involved joint, Table 17.

Joint Instability

Excessive medial lateral instability is evaluated by comparison with the uninvolved side. Values from p.49 are multiplied by the appropriate joint, Table 17.

This value should be combined with any other existing impairments.

Wrist and Elbow Joint Lateral Deviation

Measure with wrist or elbow in maximum extension.

Multiply value on p.50 by appropriate joint, Table 17.

Combine this value with any other existing impairments.

Carpal Instability without range of motion or strength deficits

These are based on radiographic findings. Refer to Table 18, p.50.

Do not use this if there are impairments of range of motion or grip present.

Do not add or combine impairments on this table - use the highest value only.

Arthroplasty

These values may be combined with range of motion deficits. Refer to Table 19, p.50. If more than one level is involved (e.g., fingers and elbow) combine deficits beginning with distal deficit.

If more than one thumb joint is involved add impairments.

If more than one joint is involved in another digit, combine impairments for that digit.

If multiple digits are involved, add the hand equivalent impairments for the digits.

Note: Resection arthroplasty referred to in the AMA Guides 3rd Edition Revised is to be used only for partial resection of the humeral head, a procedure rarely performed currently.

Neither resection nor implant arthroplasty values should be used for a distal clavicular resection. The upper extremity value assigned to a distal clavicular arthroplasty is 10%. The AMA Guides 4th and 5th Editions continue to suggest that subacromial arthroplasty should be rated using ROM, and when appropriate, 'joint crepitation with motion' from the "Other Disorders" section. In general, when any additional rating for subacromial arthroplasty is deemed appropriate in a case with or without crepitus, because "other factors have not adequately rated the extent of the impairment," it should not exceed 10%.

Intrinsic Tightness Severity without range of motion deficit

This may be given only when there is no range of motion deficit. Refer to page 52.

Bunnell's test - Restricted passive flexion of the PIP joint with MP joint hyperextended.

Multiply deficit by digit value, Table 17.

Constrictive Tenosynovitis without range of motion deficit

If there is a range of motion deficit this rating for the trigger finger cannot be used.

Refer to page 52.

Multiply deficit by digit value, Table 17.

Extensor Tendon Subluxation at MP Joint without range of motion deficit

Rating may not be given if a range of motion impairment exists.

Refer to p.52 for percentage of impairment to be multiplied by digit value on Table 17.

Loss of Strength

This section should be used only when loss of strength cannot be adequately rated using the other sections, including neurological motor deficits. The neurological motor deficit and loss of strength must not be given for the same deficit. It is suggested that at least three measurements of grip and lateral pinch strength be taken at several intervals in an exam. There should be a less than 20% variation among three readings to establish reliability. At least three reliable readings for each extremity are averaged.

$$\text{strength index} = \frac{\text{strength of the normal hand} - \text{strength of the abnormal hand}}{\text{strength of the normal hand}}$$

Use table 23, p.54 to translate the strength index into upper extremity impairment. If there is no uninjured hand, use Table 21 and Table 22 on p.53 to determine the normal strength.

CUMULATIVE TRAUMA DISORDERS

First calculate any applicable impairment from range of motion, neurologic and/or vascular findings, or other disorders (section 3.1j) excluding grip strength. If no impairment exists under these sections and the claimant has an impairment of daily living activities with anatomic and physiologic correlation, proceed to rate the impairment as follows:

1. Multiple joint and upper extremity sites can be involved in CTD. Limit the impairment determination to areas of primary pathology, with anatomic or physiologic correlation based on objective findings. Do not rate areas of reactive muscular spasm and radiating or referred pain.
2. Using the cumulative trauma matrix, determine the stage of cumulative trauma for each joint involved, Stage 1 is 0-10%, Stage 2 is 11-20%, Stage 3 is 21-30%, and Stage 4 is 31-40%. See CTD Matrix at end of this section.
3. Identify the appropriate joint impairment found on Table 17 of Chapter 3 of the AMA Guides.
4. Multiply the joint impairment from Table 17 by the CTD stage impairment from step 2 to yield an upper extremity impairment. If there is anatomic and physiologic basis to rate other joints in the same extremity, complete the rating in the manner described and combine the extremity ratings distal to proximal.

5. If extremity impairment is bilateral, convert each upper extremity impairment to whole person rating and then combine whole person ratings for both right and left upper extremities as referenced in the AMA Guides. Complete the upper extremity worksheets, Figure 1 of Chapter 3 of the AMA Guides, for each extremity separately.

The CTD rating system is preferred to impairment determined by decrease in grip strength. If grip strength is used, the CTD rating system shall not be used as it would be duplicative. Similarly, care must be taken to avoid duplicative ratings with other associated disorders where there is significant neurovascular involvement or where there is limitation in range of motion.

Patients with cumulative trauma disorders should be tested after 6-8 hours of work for determination of impairment.

Any reports involving the upper extremity must be completed using Fig. 1, pp. 12 and 13.

Table 1: Cumulative Trauma Staging Matrix

	Stage 1 (Minimal)	Stage 2 (Mild)	Stage 3 (Moderate)	Stage 4 (Severe)
History and Physical Examination	1-2 symptoms with signs identified on history and supported by physical examination with consistency of subjective and objective findings	2 or more symptoms with signs identified and supported by physical examination with consistency of subjective and objective findings	3 or more symptoms with signs identified and supported by the physical examination with consistency of subjective and objective findings	3 or more symptoms with signs identified and supported by physical examination with consistency of subjective and objective findings
	AND	AND	AND	AND
Response to Modification of Specific Aggravating Factors	Symptoms and/or signs improve or resolve with modification of specific aggravating activity	Symptoms and/or signs may improve but will not resolve completely with modification of specific aggravating activity	Symptoms and/or signs do not improve with modification of the specific aggravating activity, but may improve with elimination of the specific aggravating activity	Symptoms and/or signs do not improve with modification or elimination of the specific aggravating activity
	OR	OR	OR	OR
Activities of Daily Living (ADLs)	Minimal problems with ADLs	Noticeable aggravation by more difficult ADLs	Significant interference with most ADLs	Severe limitations of ADLs
Impairment Grades at MMI (See Note to obtain Multiplier below)	0-10%	11-20%	21-30%	31-40%

NOTE: When the Staging Matrix is used for impairment rating at Maximum Medical Improvement (MMI), assignment of the patient to a Stage should be based primarily on limitations in ADLs and history and physical examination findings. The response to modification of specific aggravating activities may be used to aid the rater in choosing a number within the available rating range. The staging number chosen from the Impairment Grades at MMI row is to be used as a multiplier in conjunction with the AMA Guides to the Evaluation of Permanent Impairment, Third Edition, Revised, Chapter 3, Table 17, to determine the impairment rating for each specific diagnosis. All of the joints that correspond with the established diagnoses should be rated.