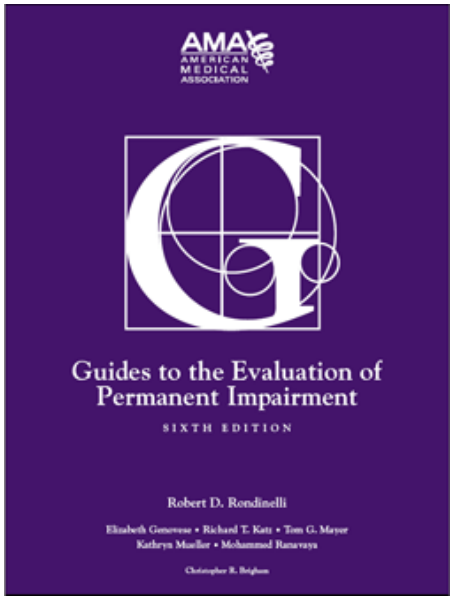
AMA Guides 6th Edition

Upper Extremity

Impairments



AMA Guides, 6th Edition

Questions ?

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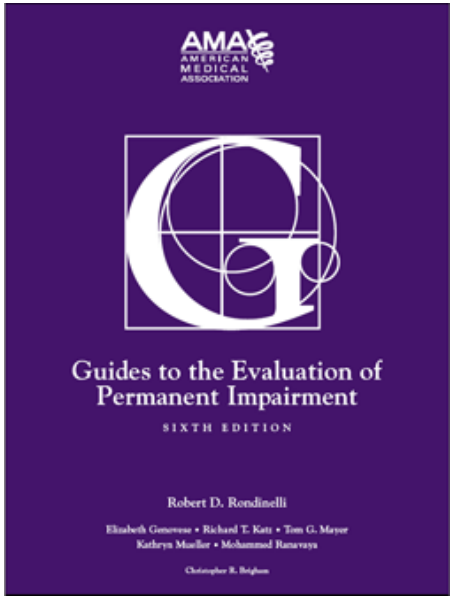
WARNING

- The Surgeon General had determined that teaching this chapter may be **hazardous to your health.**

- There is a tremendous amount of material in the Upper Extremity Chapter.

"When All Else Fails, READ the INSTRUCTIONS."



Chapter 15 UE

15.1 Principles of Assessment pg 385

15.2 Diagnosis-Based Impairment pg 387

15.3 Adjustment Grid and Grade Modifiers – Non-Key Factors pg 405

15.4 Peripheral Nerve Impairment pg 419

15.5 CRPS pg 450

15.6 Amputation pg 454

15.7 Range of Motion pg 459

15.8 Summary pg 478

15.9 Appendix pg 482

Used MOST often
Will be discussed first

Section 15.1
Principles of Assessment

- "Impairment evaluations of the upper extremity must be performed within the context of the directives in Chapters 1 and 2 and only when the conditions have reached Maximum Medical Improvement (MMI)".
  - page 384

Section 15.1
Principles of Assessment

- "The authors of this chapter recognize that the process described **is still far from perfect** with respect to defining impairment or the complexities of human function; however, the authors' intention is to simplify the rating process, to improve inter-rater reliability, and to provide a solid basis for future editions of the *Guides* ". – page 384

Impairment Classes

Philosophy – **NOT** used for rating

Table 15-1 page 385		Impairment Range	
Class	Problem	Upper Extremity	Whole Person
0	no objective findings	0%	0%
1	Mild	1% - 13%	1% - 8%
2	Moderate	14% - 15%	8% - 15%
3	Severe	26% - 49%	16% - 29%
4	Very severe	50% - 100%	30% - 60%

Diagnosis Based Impairments

The upper extremity is divided into

four regions:

[This means **4 basic tables**]

- **digits / hand**
- **wrist**
- **elbow**
- **shoulder**

- **Diagnoses** are defined in **three major categories:**
  - **soft tissue,**
  - **muscle / tendon,**
  - **ligament /bone / joint**

- This means there will be a section for each category in each of the 4 major tables

Impairment Calculation

1. **Identify anatomic region:**

   digit/hand, wrist, elbow, shoulder

2. Find Diagnosis within the Diagnosis-Based Impairment Regional Grid (DBI)

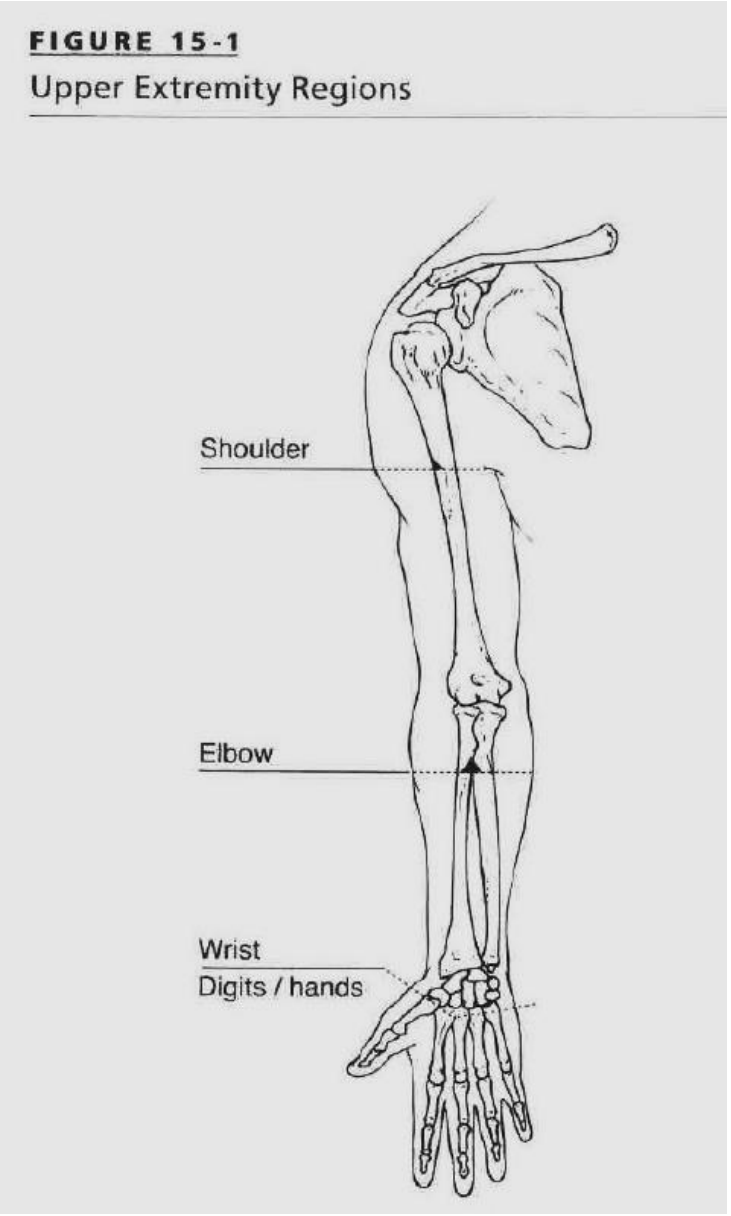
3. Identify Class

   A diagnosis may be listed across multiple classes

4. Determine Grade Modifiers – by Tables for:

   A. functional history [GMFH]
   B. physical examination [GMPE]
   C. clinical studies [GMCS]

Upper Extremity Regions



- Useful for Fractures to determine which table to use.
  - E.g. Midshaft humerus is in the Elbow grid, etc.

DBI = Diagnosis-Based Impairment

Generic Grid

Dx =					
Diagnostic Criteria	Class 0	Class 1	Class 2	Class 3	Class 4
Ranges	0%	1% - 13%	14% - 25%	26% - 49%	50% - 100%
Grade		A B C D E	A B C D E	A B C D E	A B C D E
Soft Tissue					
Muscle / Tendon					
Ligament/ Bone/Joint					

Section 15.1
Principles of Assessment

Steps involved: In all sections of chapter 15

1. Determine the **diagnosis:**
   - This determines the **Table** used
   - This determines the impairment **class**
2. Assess **"Grade Modifiers":**
   - Function: ADLs, QuickDASH,
   - Physical Exam:
   - Clinical studies:
   - ✓ Used **only if** the examiner determines they are RELIABLE and ASSOCIATED with the diagnosis.

Diagnosis based rating:
Similar to how doctors think

4 Questions:

1. What is the problem (diagnosis)?
2. What difficulties does the patient report?
3. What are the examination findings?
4. What are the results of clinical tests?

Grade Modifiers

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

Generic Example: page 412

TABLE 15-10 Methodology for Determining the Grade in an Impairment Class

DIAGNOSTIC CRITERIA (KEY FACTOR)	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RANGES (UPPER EXTREMITY %)	0	1%–13% UE	14%–25% UE	26%–49% UE	50%–100% UE
GRADE		A B **C** D E	A B **C** D E	A B **C** D E	A B **C** D E
EXAMPLE RATING		3 4 5 6 7 Class 1 Default	16 18 **20** 22 24 Class 2 Default	26 28 **30** 32 34 Class 3 Default	50 52 **54** 56 58 Class 4 Default

Steps in Performing an Impairment Rating

1. Perform history and examination, and determine if individual is at MMI.

2. Establish the reliable diagnosis for each part of the upper limb to be rated.

3. Use the regional grid in the appropriate region to determine the associated class.

4. Use the adjustment grid and the grade modifiers, including functional history, physical exam, and clinical tests, to determine what grade of associated impairment should be chosen within the class defined by the regional grid.

5. Use the regional grid to identify the appropriate impairment rating for any allowable diagnosis, impairment class, and grade.

6. Combine upper extremity percentages using the Combined Values Chart (in the Appendix at the end of the book) in the same extremity, as appropriate. If both upper extremities are involved, convert impairments to whole person and combine.

Steps: page 389

1. Hx, PE, @ MMI
2. Diagnosis
3. Regional grid CLASS
4. Use FH, PE, CS to determine grade modifiers, and pick rating from Class.

Net Adjustment Formula: Mathematical Explanation

Net adjustment may be obtained by a mathematical formula and then use of the resultant value to define the grade. The following abbreviations are used:

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

Net Adjustment = (GMFH − CDX) + (GMPE − CDX) + (GMCS − CDX)

Grade Assignments

Net Adjustment (from default C)	Grade
−2	A
−1	B
0	C
1	D
2	E

For example, if the diagnosis is in impairment class 2, then CDX = 2. If net adjustment value is −2, then the Grade is A.

Page 411

- **The "Net Adjustment Formula" is the Method** used to adjust the impairment rating **WITHIN a Class.**

MATH

Net Adjustment Formula p 411

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

Modifiers permit moving Up or Down within a Class to a different severity Grade.

Modifiers do **NOT** permit changing to a different Class.

Mathematical Explanation

For the mathematically inclined, net adjustment may be obtained by a mathematical formula and then using the resultant value to define the grade. The following abbreviations are used:

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

Net Adjustment = (GMFH-CDX)+(GMPE-CDX)+(GMCS-CDX)

Grade Assignments

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

For example, if CDX = 2, GMFH = 3, GMPE = 2, and GMCS = 3, the Net Adjustment = 2 and Grade = E

Example:

Class **2** impairment (by diagnosis)

FH = grade **1**
PE = grade **2**
CS = grade **3**

NA = (**1**-**2**) + (**2**-**2**) + (**3**-**2**)
OR
NA = **minus 1** + **0** + **plus1** = **0**

A Net adjustment of zero means The rating is grade C (the default rating)

A Net Adjustment of + 1 would mean grade D, while a Net Adjustment of – 1 would mean Grade B is the final rating.

Class 4 EXCEPTION P 412

- "If the key factor (diagnosis) is class 4, and both non-key factors were grade modifier 4, the difference would summate to zero, and placement in a grade above the default value C in class 4 would not be possible. To correct this deficiency, if the key factor is class 4, **automatically add +1 to the value of each non-key factor**."

Class 4 EXCEPTION P 412

- "For example,
  - if the key factor (diagnosis) is class 4,
  - and the first non-key factor was grade 3,
  - the second was **grade 4**,
  - the differences are -1 **and zero**.
- Adding +1 to each of these
  - yields zero **and** +1, which summates to **+1.**
- The default value C is then adjusted up 1 grade to D. Consequently, the final class and grade is **4D**."

Class 4 EXCEPTION P 521-522

Grade 3 – Class 4 = minus 1

Grade 4 – Class 4 = **0**

Thus, adjustment would be to grade B

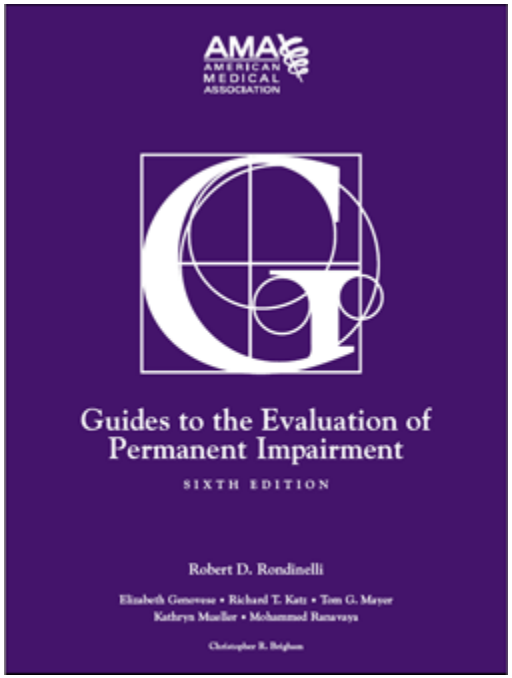
Instead:

Grade (3 + 1) – Class 4 = zero

Grade (4 + 1) – Class 4 = **+ 1**

Thus, CORRECT ADJUSTMENT is grade D

"When All Else Fails, READ the INSTRUCTIONS."



Special Instructions

- "The **diagnosis** used for placement in an impairment class must be based on **reliable** findings reflective of the impairment that is being assessed and supported by the clinical history, current examination, and clinical studies. **Objective findings** are always given the **greater weight** of evidence over subjective complaints."

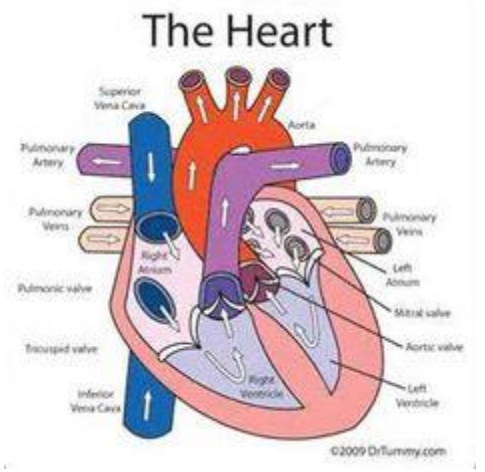
  – page 385

Physical Exam: page 386

- "It is important to ensure that upper extremity impairment discussed in this chapter is **NOT** due to underlying cervical spine pathology.
- If the neurologic exam points to an underlying spine disorder, the upper extremity impairment would, in most cases, be **accounted for** in the **spine impairment** rating (Chapter 17), assuming that there are no other primary upper extremity diagnoses requiring a concomitant rating."

Special Instructions: p 387

- "Vascular conditions are rated per **Section 4.8**, Vascular Diseases Affecting the Extremities."
  - –Cardiovascular chapter



Peripheral Vascular Disease
Chapter 4, pages 68-71

- PVD
  - Arterial: Arteriosclerosis
    - [consider claudication, atrophic changes, ulceration, gangrene, and ultimately extremity loss, plus Raynaud's]
  - Venous: Deep Venous Thrombosis
    - [edema, ulceration, pain]
  - Lymphatic: [lymphedema, recurrent infection]
- NO MENTION OF TRAUMA ????

Peripheral Vascular Disease
Chapter 4, pages 68-71

- "Raynaud's needs to be differentiated from obstructive physiology. Obstructive physiology is evaluated by objective testing including arterial pressure ratios between the digits and the brachial pressure. A ratio of less than 0.8 suggests obstructive physiology." – p 69 [Doppler technique]
- NO MENTION OF TRAUMA ????

TABLE 4-13 Criteria for Rating Impairment due to Peripheral Vascular Disease – Upper Extremity

Upper Extremity Peripheral Vascular Disease

CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
UNILATERAL UE IMPAIRMENT RATING (%)	0	2%-10%	11%-23%	24%-40%	45%-65%
SEVERITY GRADE (%)		2 4 6 8 10 (A B C D E) (Minimal)	11 14 17 20 23 (A B C D E) (Mild)	24 28 32 36 40 (A B C D E) (Moderate)	45 50 55 60 65 (A B C D E) (Severe)
HISTORY	No intermittent claudication or pain at rest or transient edema No curtailment of activity	Intermittent claudication with heavy upper extremity usage, persistent edema or pain with cold exposure	Intermittent claudication with moderate upper extremity usage or mild edema	Intermittent claudication with mild upper extremity usage or moderate edema	Severe and consistent pain at rest or severe edema
PHYSICAL FINDINGS	No findings except loss of pulses or minimal loss of subcutaneous tissue of fingertips	Vascular damage evidence such as healed, painless stump of amputated digit with evidence of persistent vascular disease or a healed ulcer or Raynaud's phenomena with obstructive physiology that incompletely responds to lifestyle change or medical therapy	Vascular damage evidenced by a healed amputation of two or more digits of one extremity with evidence of persistent vascular disease or superficial ulceration	Vascular damage as evidenced by signs such as amputation at or above the wrist or amputation of two or more digits of both extremities with evidence of persistent vascular disease or persistent widespread or deep ulceration of one extremity	Vascular damage as evidenced by amputation at or above both wrists or amputation of all digits with evidence of persistent widespread or deep ulceration involving both upper extremities
OBJECTIVE TEST RESULTS[a]	Arterial calcification by radiography	Finger/brachial indices <0.8 or low digital temperatures with decreased laser Doppler signals that do not normalize with warming	Mildly abnormal upper extremity arterial or venous Doppler study (excludes amputation)	Moderately abnormal upper extremity arterial or venous Doppler study (excludes amputation)	Markedly abnormal upper extremity arterial or venous Doppler study (excludes amputation)

[a] Key factor.

page 70

KEY FACTOR = Objective tests results

Pulses
Ankle/Brachial Index

BP in “better” ankle artery ÷ BP in “better” arm

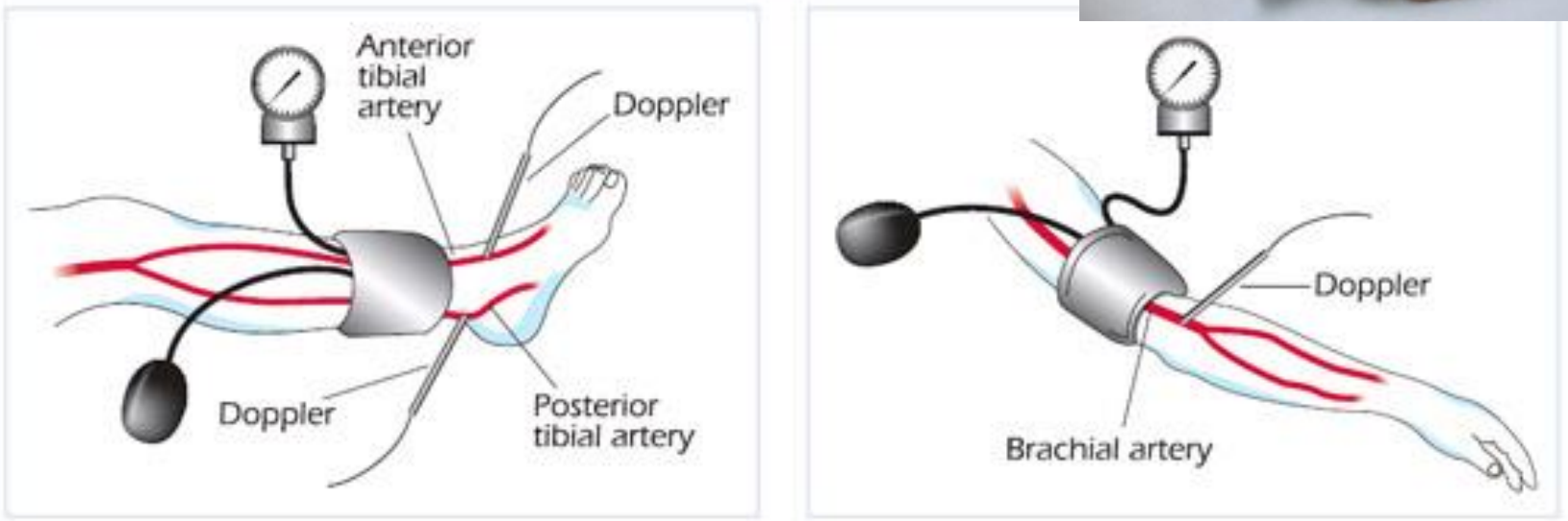


Figure 2 Measurement of the ankle–brachial index (ABI), calculated by dividing the ankle systolic blood pressure by the arm systolic blood pressure.

$500 - $ 1000 Hand Held Doppler Units

Ankle – Brachial Index

- Normal = 0.9 to 1.2
- **From 0.4 to 0.9** is significant peripheral artery disease
  - 0.4 severe
  - 0.9 mild
  - < 0.4 usually rest pain or tissue loss

Limb Temperature

Who to send for arterial Doppler study?

Objective measurement

Available on line as "Infra-red temperature probe"

Palpable pulse and symmetric limb temperature,

probably OK

Special Instructions Upper Extremities 6th Ed.

- "The evaluator is expected to **choose the [*one*] most significant diagnosis** and to rate only that **[one]** diagnosis using the DBI method that has been described. –p 390 & 409

- If clinical studies confirm more than one …**the grade** can be modified according to the Clinical Studies Adjustment Table (table 15-9)." (p 390 & 409)

Example

- "In the Shoulder, it is not uncommon for rotator cuff tears, SLAP or other labral lesions, and biceps tendon pathology to all be present simultaneously. The evaluator is expected to **choose the most significant diagnosis** and to **rate ONLY that diagnosis** ... the **grade** can be **modified** according to the Clinical Studies Adjustment Table (15-9)." page 390 & 409

Restated page 389

- "If more than 1 diagnosis can be used, the one that provides the **highest causally related** impairment rating should be used; this will **generally** be the more specific diagnosis."

Significant Comment for
Distal Clavicle Resection

Page 387, Right Column, Paragraph 4

and biceps tendonitis, the examiner should use the diagnosis with the highest causally related impairment rating for the impairment calculation. Thus, when rating rotator cuff injury/impingement or glenohumeral pathology/surgery, incidental resection arthroplasty of the AC joint is not rated.

Examples

Source	Example 1 Mr I	Example 2 Mr C	Example 3 Mr A
Office Note **Primary** Diagnosis	Impingement	Rotator cuff tear	AC joint arthritis
Operation Report Diagnosis #1	Impingement	Rotator cuff tear	AC joint arthritis
Operation Report Diagnosis # 2 or #3	AC joint arthritis	AC joint arthritis	Impingement
Operation report Procedure #1	Subacromial decompression	Rotator cuff repair	AC joint resection arthroplasty
Procedure #2	AC joint resection arthroplasty	AC joint resection arthroplasty	Subacromial decompression
Rate as	**Impingement** (p 402), adjust grade modifier for arthritis ???	**Rotator cuff tear** (p 402-3), adjust grade modifier for arthritis ???	**AC joint** arthritis, **resection** arthroplasty, p 403 Adjust for other pathology ???

What if the Diagnosis is **not** listed?

- "In the event that a specific diagnosis is **not** included in the Diagnosis-Based regional grid, the examiner should **use a similar listed condition** as a guide to determining an impairment value. In the report, the examiner must fully explain the rationale for the **analogy**"
  - page 385

Special Instructions

- "The fact that the joint has undergone surgery does **not** result in an "add-on" value or additional impairment percentage. Impairment ratings are based on the patient's condition at the time of the rating" (pg. 389)

Exception: Elbow tendinopathy

Special Instructions

- "Painful disorders in a regional grid are rated **only once**.

- It is duplicative to rate both "soft tissue" and "muscle tendon" (p 389)
  – [*from the same table*].

Special Instructions

- "Diagnoses must be objectively based and modified by reliable findings using the adjustment grids…**if** a **physical exam** or **clinical study** finding is used to define the DBI, **it*** **can not also be used** as an adjustment." (pg 390)
  - * = that same finding

Range of Motion

- " Range of motion is used primarily as a physical examination adjustment factor, and only to determine actual impairment values when a grid permits its use as an option; this is a significant change from prior editions." – page 387
- Translation looks like: use DBI whenever possible, rarely, if ever, use ROM
- But……

Special Instructions

- "Range of motion **may**, under specific circumstances, be **selected** as an **alternative approach** to rating impairment...(such) diagnoses are identified by an asterisk (*) in the grids…(**a rating) calculated by range of motion….stands alone**" and may not be combined with a DBI (p 390)

Wrist Regional Grid

IMPAIRMENT CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RANGES (upper extremity %)	0	1%–13% UE	14%–25% UE	26%–49% UE	50%–100% UE
GRADE		A B C D E	A B C D E	A B C D E	A B C D E
SOFT TISSUE*					
Wrist pain* nonspecific wrist pain post acute injury or surgery (not otherwise specified) **Wrist contusion or crush injury*** with healed minor soft tissue or skin injury	0 No significant symptoms or signs at MMI	0 0 1 1 1 History of painful injury, residual symptoms without consistent objective findings (this impairment can only be given once in an individual's lifetime)			
Wrist mass or ganglion cyst*		1 2 2 2 3 Residual symptoms and consistent objective findings at MMI			
MUSCLE/TENDON*					
Wrist pain*: nonspecific wrist pain post acute injury or surgery (not otherwise specified)	0 No significant symptoms or signs at MMI	0 0 1 1 1 History of painful injury, residual symptoms without consistent objective findings (this impairment can only be given once in an individual's lifetime)			
Wrist sprain/strain* includes initial diagnoses of first-, second-, and third-degree sprain. No residual instability or loss of motion but persisting pain at MMI (eg, de Quervain's disease, intersection syndrome, nonspecific tendonitis)	0 No significant objective abnormal findings of muscle or tendon injury at MMI	0 1 1 2 2 History of painful injury, residual symptoms without consistent objective findings (this impairment can only be given once in an individual's lifetime)			
Wrist laceration or ruptured muscle/tendon*	0 No residual findings: +/– surgical treatment	3 4 5 6 7 Residual loss, functional with normal motion			

(continued)

TABLE 15-3 (CONTINUED) Wrist Regional Grid: Upper Extremity Impairments

IMPAIRMENT CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RANGES (upper extremity %)	0	1%–13% UE	14%–25% UE	26%–49% UE	50%–100% UE
GRADE		A B C D E	A B C D E	A B C D E	A B C D E
LIGAMENT/BONE JOINT*					
Wrist sprain/h/o dislocation* including carpal instability	0 No residual findings: +/– surgical treatment	6 7 8 9 10 Mild instability (grade modifier 1 per radiographic studies and criteria in Table 15-9) *(clinical studies excluded from adjustment process)*	14 15 16 17 18 Moderate instability (grade modifier 2 per radiographic studies and criteria in Table 15-9) 20 22 24 25 25 Severe instability (grade modifier 3 per radiographic studies and criteria in Table 15-9) *(clinical studies excluded from adjustment process)*		
Triangular fibrocartilage complex (TFCC) tear*	0 No residual findings: +/– surgical treatment	6 7 8 9 10 Documented TFCC injury +/– surgery with residual findings			
Fracture*	0 No residual findings: +/– surgical treatment	1 2 3 4 5 Residual symptoms, consistent objective findings and/or functional loss, with normal motion			
Avascular necrosis (AVN) of lunate (Kienbock's disease)*		1 2 2 3 4 Stage 1 normal bone architecture on plain X rays, MRI may be normal or show early stages 3 4 5 6 7 Stage 2 abnormal bone architecture on plain X rays or MRI but no carpal lunate collapse	14 15 16 17 18 Stage 3 abnormal bone architecture on plain X rays or MRI with lunate collapse or fragmentation 17 19 22 23 25 Stage 4 abnormal bone architecture on plain X rays or MRI with lunate collapse or fragmentation and adjoining bones affected. If treated surgically, wait until MMI and rate by type of surgical treatment		

Subjective Complaints Only

- " Subjective complaints **without** objective physical findings or significant clinical (studies) abnormalities are assigned to Class 0 and have usually no ratable impairment" –p 387
- HOWEVER,

  NEW to the 6th Edition is a way to rate

  "I hurt because of my job"

  for which there is no scientific diagnosis.

  - And **no** objective findings

TABLE 15-3 Wrist Regional Grid: Upper Extremity

Example: Wrist Grid
Same concept in Digit, Elbow, and Shoulder

Wrist Regional Grid

IMPAIRMENT CLASS	CLASS 0	CLASS 1	CLASS 2	
IMPAIRMENT RANGES (upper extremity %)	0	1%–13% UE	14%–25% UE	
GRADE		A B C D E	A B C D E	A
SOFT TISSUE*				
Wrist pain* nonspecific wrist pain post acute injury or surgery (not otherwise specified) **Wrist contusion or crush injury*** with healed minor soft tissue or skin injury	0 No significant symptoms or signs at MMI	0 0 1 1 1 History of painful injury, residual symptoms without consistent objective findings (this impairment can only be given once in an individual's lifetime)		

Special Instructions

- "The grade modifiers, or "non-key" factors, are considered **only** if they are determined by the examiner to be **reliable** **and** **associated** with the diagnosis." – page 385

Functional History, Physical Exam, Clinical Studies

Functional History: Text

- Section 15.1, page 386
  - Criteria based on ADL impairment
- Section 15.3a, page 406
  - Table 15-7
- Section 15.1 Clarifies Section 15.3a and the use of Table 15-7

Functional History

Section 15.1, page 386

Grade Modifier	Interference
0	None demonstrable
1	Vigorous or extreme use of the limb only
2	Regular use of the limb for ADLs but helper assistance (i.e., assistance of another person) is **not** required.
3	Minimal use of the limb for ADLs and **some helper assistance** (ie, assistance of another person) is **required.**
4	Interference with **All** use of the limb precludes activity or **requires total assistance for some or all ADLs.**

Functional History: p 406

- Functional history grade modifier should be applied **only to the SINGLE, HIGHEST** diagnosis-based impairment (in a limb).

TABLE 15-7

Functional History Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
	Asymptomatic	Pain/symptoms with strenuous/vigorous activity; +/− medication to control symptoms	Pain/ symptoms with normal activity; +/− medications to control symptoms	Pain/symptoms with less than normal activity (minimal); +/− medications to control symptoms	Pain/symptoms at rest; +/− medications to control symptoms
Note the word "AND"		AND able to perform self-care activities independently	AND able to perform self-care activities with modification but unassisted	AND requires assistance to perform self-care activities	AND unable to perform self-care activities
*Quick*DASH Score	0–20	21–40	41–60	61–80	81–100

Functional History: Upper Extremity

- Consider symptoms, ADL ability, and **"may use"** the QuickDASH (page 406)

TABLE 15-7

Functional History Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
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		AND able to perform self-care activities independently	AND able to perform self-care activities with modification but unassisted	AND requires assistance to perform self-care activities	AND unable to perform self-care activities
*Quick*DASH Score	0–20	21–40	41–60	61–80	81–100

For scores > 60 is a HELPER required for ADLs??

Functional History: Upper Extremity

- "… and those with constant symptoms that persist despite treatment **AND** are **unable** to perform self-care activities, will be assigned grade 4 modifier. – page 406

Functional History: Upper Extremity

TABLE 15-7

Functional History Adjustment: Upper Extremities

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Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
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		AND able to perform self-care activities independently	AND able to perform self-care activities with modification but unassisted	AND requires assistance to perform self-care activities	AND unable to perform self-care activities
*Quick*DASH Score	0–20	21–40	41–60	61–80	81–100

AND AND AND AND

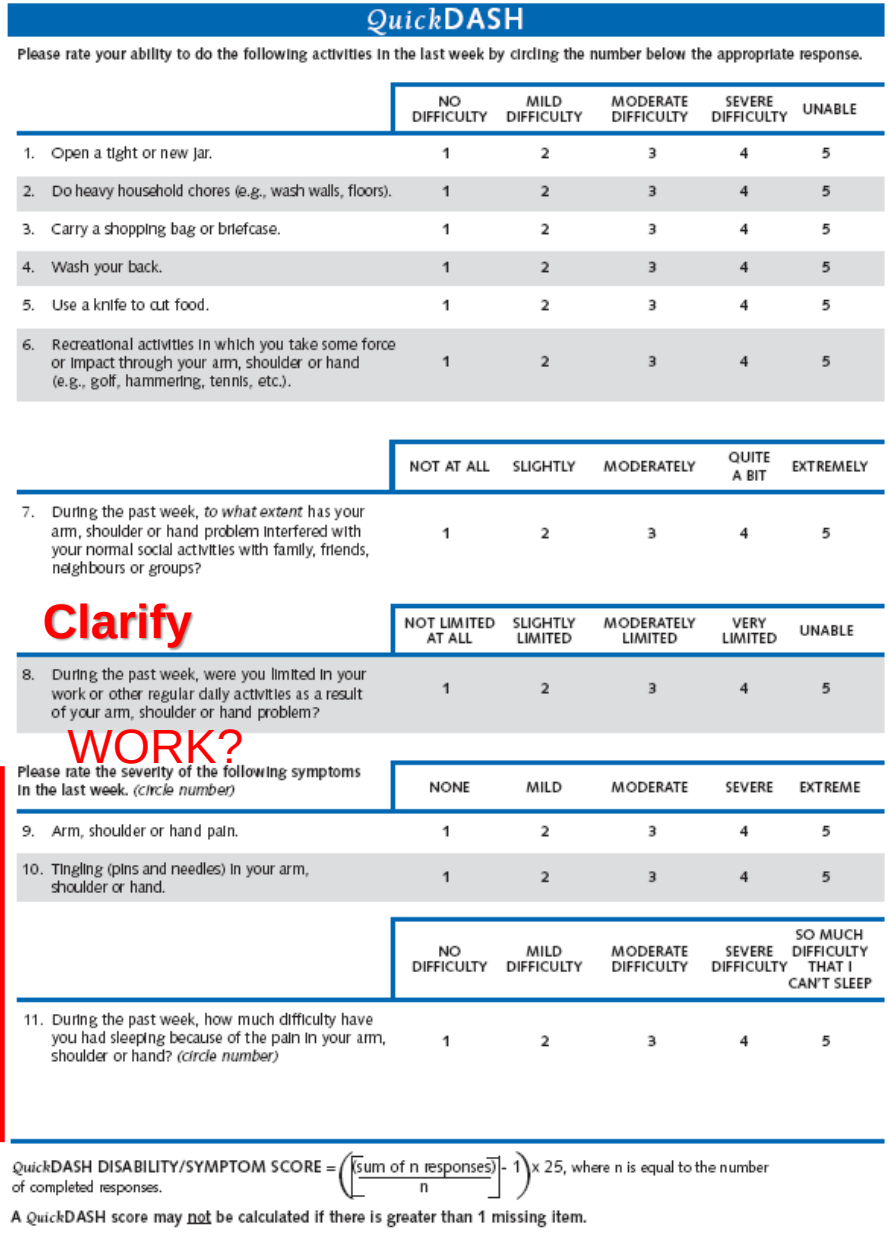
Functional History: Upper Extremity

Page 406

- "… may be used… "
- "… only to assist …"
- "… does **not** serve as a basis for defining further impairment …"

- "… assess the reliability of the functional reports recognizing the potential influence of behavioral and psychological factors."

- **If** the grade for functional history differs by 2 or more grades from that defined by physical examination or clinical studies the functional history should be assumed to be **unreliable."**



QuickDASH

Please rate your ability to do the following activities in the last week by circling the number below the appropriate response.

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	UNABLE
1. Open a tight or new jar.	1	2	3	4	5
2. Do heavy household chores (e.g., wash walls, floors).	1	2	3	4	5
3. Carry a shopping bag or briefcase.	1	2	3	4	5
4. Wash your back.	1	2	3	4	5
5. Use a knife to cut food.	1	2	3	4	5
6. Recreational activities in which you take some force or impact through your arm, shoulder or hand (e.g., golf, hammering, tennis, etc.).	1	2	3	4	5

	NOT AT ALL	SLIGHTLY	MODERATELY	QUITE A BIT	EXTREMELY
7. During the past week, *to what extent* has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbours or groups?	1	2	3	4	5

Clarify

	NOT LIMITED AT ALL	SLIGHTLY LIMITED	MODERATELY LIMITED	VERY LIMITED	UNABLE
8. During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem?	1	2	3	4	5

WORK?

Please rate the severity of the following symptoms in the last week. *(circle number)*	NONE	MILD	MODERATE	SEVERE	EXTREME
9. Arm, shoulder or hand pain.	1	2	3	4	5
10. Tingling (pins and needles) in your arm, shoulder or hand.	1	2	3	4	5

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	SO MUCH DIFFICULTY THAT I CAN'T SLEEP
11. During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder or hand? *(circle number)*	1	2	3	4	5

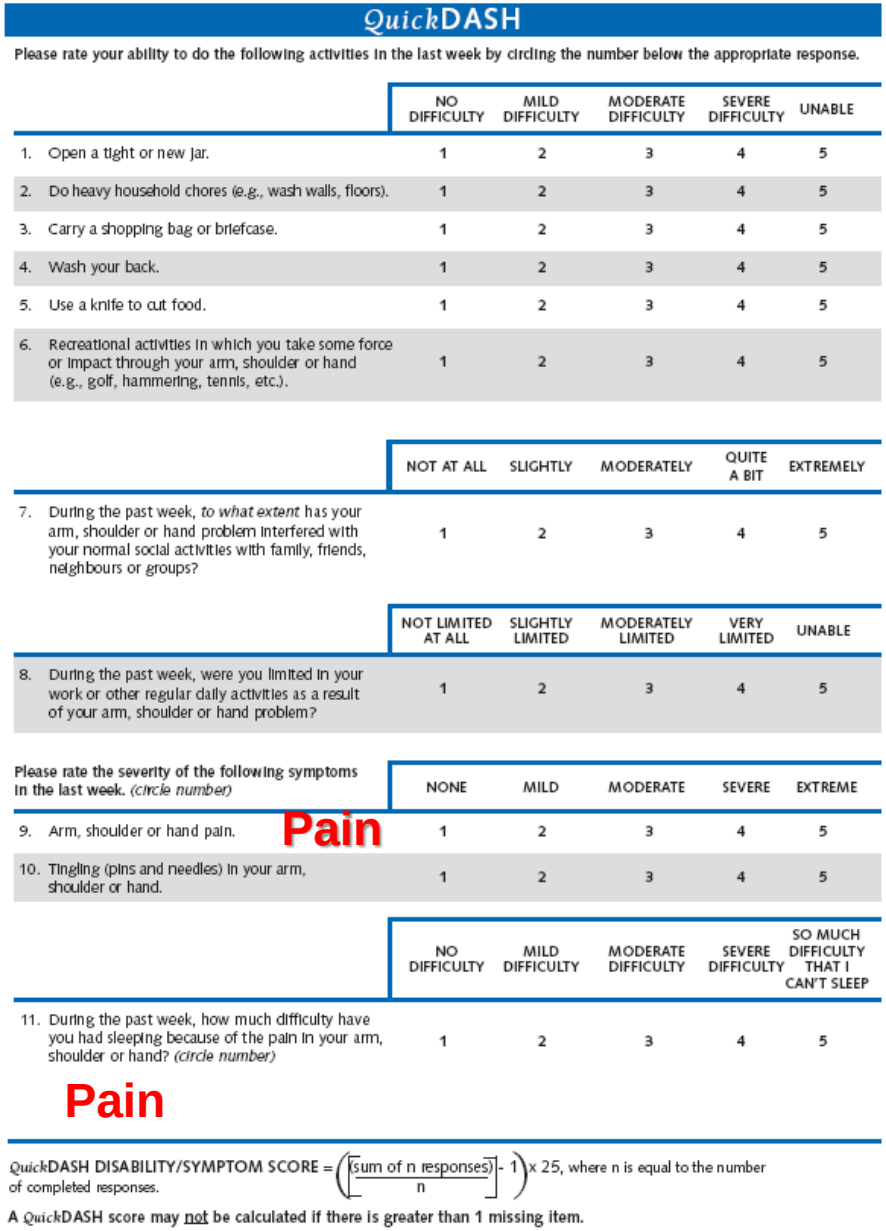
QuickDASH DISABILITY/SYMPTOM SCORE = $\left(\left[\frac{\text{sum of n responses}}{n}\right] - 1\right) \times 25$, where n is equal to the number of completed responses.

A QuickDASH score may not be calculated if there is greater than 1 missing item.

Functional History: Upper Extremity

Page 406

- **PC 289** (injuries on or after 07/01/17)
- The treating physician or chiropractor shall assign impairment ratings as a percentage of the body as a whole and **shall not consider complaints of pain** in calculating the degree of impairment, notwithstanding allowances for pain provided by the applicable edition of the AMA guides as established by this chapter.
- **QuickDASH: If 2 or more questions are unanswered, the questionnaire is NOT valid.**
- **2 questions are disqualified; therefore, do NOT use the QuickDASH in TN for injuries on or after 07/01/14**



QuickDASH

Please rate your ability to do the following activities in the last week by circling the number below the appropriate response.

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	UNABLE
1. Open a tight or new jar.	1	2	3	4	5
2. Do heavy household chores (e.g., wash walls, floors).	1	2	3	4	5
3. Carry a shopping bag or briefcase.	1	2	3	4	5
4. Wash your back.	1	2	3	4	5
5. Use a knife to cut food.	1	2	3	4	5
6. Recreational activities in which you take some force or impact through your arm, shoulder or hand (e.g., golf, hammering, tennis, etc.).	1	2	3	4	5

	NOT AT ALL	SLIGHTLY	MODERATELY	QUITE A BIT	EXTREMELY
7. During the past week, *to what extent* has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbours or groups?	1	2	3	4	5

	NOT LIMITED AT ALL	SLIGHTLY LIMITED	MODERATELY LIMITED	VERY LIMITED	UNABLE
8. During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem?	1	2	3	4	5

Please rate the severity of the following symptoms in the last week. *(circle number)*	NONE	MILD	MODERATE	SEVERE	EXTREME
9. Arm, shoulder or hand pain. **Pain**	1	2	3	4	5
10. Tingling (pins and needles) in your arm, shoulder or hand.	1	2	3	4	5

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	SO MUCH DIFFICULTY THAT I CAN'T SLEEP
11. During the past week, how much difficulty have you had sleeping because of the pain in your arm, shoulder or hand? *(circle number)*	1	2	3	4	5

Pain

QuickDASH DISABILITY/SYMPTOM SCORE = $\left(\left[\frac{\text{sum of n responses}}{n}\right] - 1\right) \times 25$, where n is equal to the number of completed responses.

A QuickDASH score may not be calculated if there is greater than 1 missing item.

http://www.dash.iwh.on.ca/system/files/quickdash_questionnaire_2010.pdf

*Quick*DASH DISABILITY/SYMPTOM SCORE = $\left(\left[\frac{\text{(sum of n responses)}}{n}\right] - 1\right) \times 25$, where n is equal to the number of completed responses.

A *Quick*DASH score may not be calculated if there is greater than 1 missing item.

- Example:
- **Raw score is 33**

  [sum of scores on all 11 questions]
- 33 ÷ 11 = 3
- 3 – 1 = 2
- 2 X 25 = **50 - the QuickDASH score**

Functional History: page 407

- "If the functional history is determined to be unreliable or inconsistent with other documentation, it is **excluded** from the grading process."

QuickDASH: page 482 Appendix

- "The QuickDASH contains 11 questions, and Work Module contains 4 additional questions. Since impairment addresses loss of function but not work activities specifically, only the first 11 questions will be **used** in reference to the AMA Guides. " - 482

QuickDASH: page 482 Appendix

- "If there is more than 1 QuickDASH question that is **not answered** or missing, the QuickDASH cannot be calculated. Therefore if 10 or 11 QuickDASH questions have been answered, the QuickDASH can be used to establish the "Functional Scale score used in the evaluation of upper extremity impairment."

QuickDASH: page 482 Appendix

- "If the QuickDASH is to be used to modify the default impairment rating, the examiner MUST correlate the information provided by the QuickDASH and a list of Activities of Daily Living (ADLs). " (Table 15-37)

TABLE 15-37

Activities of Daily Living Questionnaire

Name: _____ Date: _____

Activity	No difficulty	Some difficulty	*Cannot* perform
Self-care, Personal Hygiene			
Urinating			
Defecating			
Brushing teeth			
Combing hair			
Bathing			
Dressing			
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			
Sexual Function			
Orgasm			
Ejaculation			
Lubrication			
Erection			
Sleep, Restful Pattern			

Can be given
to patients
To fill out as
a questionnaire

ADLs Questionnaire Evaluation

Activity	Difficulty logical with impairment of a single upper limb	Difficulty *NOT* logical if only a single upper limb is impaired	Difficulty logical only if both upper limbs have impairments
Self-care, Personal Hygiene			
Urinating		X	X
Defecating		X	X
Brushing teeth		X	X
Combing hair		X	X
Bathing		X	X
Dressing	Buttons and zippers		X
Eating	Some foods		X
Communication			
Writing	Yes[a] if dominant limb involved		X
Typing	Yes[a]		X
Seeing		X	
Hearing		X	
Speaking		X	
Physical Activity			
Standing		X	
Sitting		X	
Reclining		X	
Walking		X	
Climbing stairs		X	
Sensory Function			
Hearing		X	
Seeing		X	
Tactile feeling		X*	X[a]
Tasting		X	
Smelling		X	
Nonspecialized Hand Activities			
Grasping	Some objects		X
Lifting	Some objects		X
Tactile discrimination		X	X[a]
Sexual Function			
Orgasm			
Ejaculation			
Lubrication			
Erection			
Sleep, Restful Pattern	Yes, due to pain	Yes, if pain is not an issue	Yes, due to pain

[a] Difficulty should not occur with proximal limb problems, such as shoulder pathology, because this function uses the distal upper limb.

Table 15-38, p 484

QuickDASH: page 482 Appendix

- "The physician can then look for **consistency** in the answers to the 2 questionnaires **and** in the patient's history. Actual problems with ADLs should be easy for an individual to recall, and the **answers should be consistent**."

Page 485

TABLE 15-39

Comparison Between *Quick*DASH and ADL Questionnaires

*Quick*DASH question	ADL Questionnaire correlate
1. "open a tight or new jar"	Grasping
2. "heavy household chores (eg, wash walls, floors)"	Grasping and lifting
3. "carry a shopping bag or briefcase"	Grasping and lifting
4. "wash your back"	Grasping and bathing
5. "use a knife to cut food"	Grasping and eating (perhaps tactile feeling)
6. recreational activities"	Grasping, tactile feeling, lifting
7. "social activities	No correlate; upper limb impairments should not produce social difficulty
8. "work or ADLs"	Writing, typing, tactile feeling, grasping, lifting, and/or tactile discrimination
9. "arm, shoulder, or hand pain"	No direct correlate
10. "tingling"	Tactile feeling and tactile discrimination
11. "sleeping"	Sleep

Note: ADL indicates Activity of Daily Living.

Source: *Quick*DASH questions from Beaton et al, 2005.

QuickDASH: page 482 Appendix

- "Inconsistent answers suggest either symptom exaggeration or problems **comprehending** the questionnaires due to low proficiency in English or comorbid brain pathology."
- "In addition, individual answers should be **logical**."

QuickDASH: page 482 Appendix

- "Many of the activities in the Activities of Daily Living Questionnaire can be directly observed by the physician to document that difficulty with the activity does exist, and to quantify the degree of difficulty."

QuickDASH: page 482 Appendix

- "Individuals can be asked to dress and to simulate eating, brushing teeth, combing hair, writing, typing, feeling, grasping, and lifting.
- Such ADLs as seeing, hearing, and speaking can be judged while taking the medical history."
  - NOTE: These have been deleted from the table of ADLs (table 1-1, page 7)

QuickDASH: page 482 Appendix

- "Individuals can also be asked to stand, sit, walk, climb stairs, and so forth. These activities should be **unaffected** by upper limb problems."

Do NOT ASK to Observe Sexual Activity

But many times the significant other will confirm (complain about)

Aside: Questionnaires

- Pencil and paper **questionnaires** have been developed for a number of injuries and illnesses.
  - "VALIDATED" – meaning researched,
    and if given to
    a non-compensation seeking population
    of patients before and after a treatment
    (for example, total knee replacement)
    the improvement after treatment
    measures the effect size of the treatment.

IMPORTANT CAVEAT

- The concept of giving a questionnaire to a compensation ($$) seeking patient and saying:
  - "Please fill this out.
  - The better you look on this questionnaire, the less money we will pay you.
  - The **worse you look** on this questionnaire, **the more money** we will pay you.

–But, please fill this out honestly"

HAS NEVER BEEN TESTED !

Adjustment Grid: Physical Exam

- Includes: (Table 15-8)
- "Observed and palpatory findings"
  tenderness, swelling, mass, crepitance
- "Stability"
- "Alignment/deformity"
- "Range of Motion"
- "Atrophy"

TABLE 15-8

Physical Examination Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Observed and Palpatory Findings (tenderness, swelling, mass, or crepitance)	No consistent findings	Minimal palpatory findings, consistently documented, without observed abnormalities	Moderate palpatory findings, consistently documented, and supported by observed abnormalities	Severe palpatory findings, consistently documented, and supported by observed moderate or greater abnormalities	Very severe palpatory findings, consistently documented, and supported by observed severe abnormalities
Stability	Stable	Grade 1 (slight) instability	Grade 2 (moderate) instability	Grade 3 (serious) instability	Gross instability
Hand/finger/thumb		Pain with stressing of ligament, but no opening of joint with stress	Pain and slight opening	Pain and >5 mm of joint opening with stress	Severe instability
Wrist		Clicking or clunking by history, but not reproducible	Clicking or clunking by history, and reproducible on physical examination		
Wrist excessive passive/active mediolateral joint deviation degrees compared to normal		<10° passive <20° active	10°–20° passive 20°–30° active	>20° passive >30° active	
Shoulder		Grade 1 (slight) instability; subluxable	Grade 2 (moderate) instability; easily subluxable	Grade 3 (serious) instability; dislocatable with anesthesia or sedation	
Alignment/ Deformity	Normal for individual with symmetry to opposite side	Mild	Moderate	Severe	Very severe
Range of Motion (reference Section 15.7)	None	Mild decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment <20% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of <12% upper extremity impairment.	Moderate decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment of 20% to 39% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of 12% to 23% upper extremity impairment.	Severe decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment of 40% to 70% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of 24% to 42% upper extremity impairment.	Very severe decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment >70% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment >42% upper extremity impairment.
Muscle Atrophy (asymmetry compared to opposite normal)	<1 cm	1.0–1.9 cm	2.0–2.9 cm	3.0 cm–3.9 cm	4.0 cm +

Note: ROM indicates range of motion; GH indicates Glenohumeral.

Physical Exam
Upper Extremities

- Observed and palpatory findings
- Stability
- Hand/finger/thumb
- Wrist
- Wrist [excessive medial/lateral deviation]
- Shoulder
- Alignment/deformity
- Range of motion
- Muscle atrophy

TABLE 15-8

Physical Examination Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Observed and Palpatory Findings (tenderness, swelling, mass, or crepitance)	No consistent findings	Minimal palpatory findings, consistently documented, without observed abnormalities	Moderate palpatory findings, consistently documented, and supported by observed abnormalities	Severe palpatory findings, consistently documented, and supported by observed moderate or greater abnormalities	Very severe palpatory findings, consistently documented, and supported by observed severe abnormalities
Stability	Stable	Grade 1 (slight) instability	Grade 2 (moderate) instability	Grade 3 (serious) instability	Gross instability
Hand/finger/thumb		Pain with stressing of ligament, but no opening of joint with stress	Pain and slight opening	Pain and >5 mm of joint opening with stress	Severe instability
Wrist		Clicking or clunking by history, but not reproducible	Clicking or clunking by history, and reproducible on physical examination		
Wrist excessive passive/active mediolateral joint deviation degrees compared to normal		<10° passive <20° active	10°–20° passive 20°–30° active	>20° passive >30° active	
Shoulder		Grade 1 (slight) instability; subluxable	Grade 2 (moderate) instability; easily subluxable	Grade 3 (serious) instability; dislocatable with anesthesia or sedation	
Alignment/ Deformity	Normal for individual with symmetry to opposite side	Mild	Moderate	Severe	Very severe
Range of Motion (reference Section 15.7)	None	Mild decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment <20% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of <12% upper extremity impairment.	Moderate decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment of 20% to 39% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of 12% to 23% upper extremity impairment.	Severe decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment of 40% to 70% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of 24% to 42% upper extremity impairment.	Very severe decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment >70% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment >42% upper extremity impairment.
Muscle Atrophy (asymmetry compared to opposite normal)	<1 cm	1.0–1.9 cm	2.0–2.9 cm	3.0 cm–3.9 cm	4.0 cm +

Note: ROM indicates range of motion; GH indicates Glenohumeral.

Physical Exam
Upper Extremities

- Photocopy THIS Table, and take it with you into the exam room, so you do not forget to measure and record potential pertinent findings.

Physical Exam: Upper Limb

- "Severe tenderness" is Grade 3 modifier
  - Yet, if no objective findings, is this not tenderness out of proportion to objective findings and a sign of symptom magnification?
- Wrist Stability: "Clicking or clunking by history, but **not** reproducible"
  - Is this not a **symptom,**
    NOT a **physical** exam finding?

Physical exam

- "If exam findings are unreliable **or** inconsistent, or if **unrelated** to the condition being rated, they are **excluded** from the grading process" (p 407)
- Table 15-8
- Section 15-7 addresses ROM

Physical Exam: page 407

- Clinician needs to determine the significance of the Physical Exam findings.

- Greater weight given to objective findings.
- If physical factors are **used to determine class placement,** they* **should not** be used again as modifiers.
  - * = those same exam findings should **not** be used

Physical Exam: page 386

- "Positive (abnormal), negative (normal), and non-physiologic findings must be assessed bilaterally. If the opposite extremity is uninvolved and **not previously injured**, it should be **used** to **define normal** for that individual."

Physical Exam: ROM

- *6th edition* Advises MEASUREMENT and documentation of both **active** and passive ROM (p 461)
- "many different factors can limit ROM …failure of the nerve, muscle, tendon or effort…guarding should be palpable… limitation of passive ROM can be from the joint itself…"

Physical Exam: ROM

- Used as a **"Stand Alone"** rating when other grids refer to this section (p 461).
- Final impairment may be adjusted for functional history in certain cases (461).
- Examples of grid referral for ROM include "pain in digit, digital stenosing tenosynovitis, post traumatic DJD, dislocation".
  - Actually all diagnoses in all 4 Tables

Physical Exam: ROM

- …may be due to a “joint contracture or antagonistic muscle or tendon that holds back the motion because it is adherent or too short” (pg 461)

- **Active ROM** is a more sensitive indicator of joint loss of motion, but is also more sensitive to symptom magnification, and self inhibition”
  - (p 461)

Physical Examination: ROM

- "If it is clear to the evaluator that a restricted range of motion has an organic basis, 3 measurements should be obtained and the greatest range measured should be used for the determination of impairment."

  —P 407

Physical Exam: page 407
Range of Motion

- "If … there is **inconsistency** in **a** rating class between the findings of 2 observers, **or** in the findings on separate occasions by the same observer, the results are considered invalid and can not be used to rate impairment."

Physical Exam: page 407
Range of Motion

- "Range of motion restrictions in multiple directions do increase the impairment. The total value* for the digit, wrist, elbow, or shoulder are compared with the criteria in Table 15-8 to define the range of motion grade modifier.
  - * = add the impairments within the same joint
- **Range of motion impairment** is **NOT combined** with the **DBI**."

Clinical Studies: p 407

"Although imaging and other studies may assist in making a diagnosis, it is important to note that a positive imaging study in and of itself does **not** make a diagnosis."

"In other words, an imaging study is useful to **confirm** a diagnosis, but the result of an imaging study alone is insufficient to qualify for an impairment."

Clinical Studies: page 386

- The physician needs to review and document actual studies … including x-rays, CT scans, MRIs, nuclear scans, ultrasound exams, and electrodiagnostic testing.
- "In some cases, only reports may be available, and this should be noted in the record."

Clinical Studies: p 386

"Clinical test results that do not correlate with the patient's symptoms or support the diagnosis should be **commented** on by the examiner.

?? "commented on"

Does this mean

"DO **NOT** USE to rate impairment" **????**

Clinical Studies: p 407

- "If a finding is used for placement of a diagnosis within a specific class in a DBI grid, that same finding **cannot** also be used as a grade modifier."

Clinical Studies: Observation

- The chapter does **not** mention timing.
  - Should you use studies done
    - On the day of injury ?
    - Immediately before surgery ?
    - **At MMI ?**
    - **Most recent ?**
  - **Lower limb, p 518 "For adjustment purposes, findings at MMI are used."**
  - **What if you're evaluating many years after MMI?**

Clinical Studies
Comment on EMGs – Page 409

- Electrodiagnostic studies should be performed by a licensed physician who is qualified by education, training, and experience in these procedures.
- **Typically,** these studies are performed by board certified neurologists and physical medicine specialists.
- Some jurisdictions allow others to perform such studies.
- The studies must be performed in accordance with established standards.

Clinical Studies page 410

- Use only 1 diagnosis to get Class
- Use “other pathology” to ADJUST Grade

TABLE 15-9

Clinical Studies Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Imaging Studies	No available clinical studies or relevant findings	Clinical studies confirm diagnosis, mild pathology	Clinical studies confirm diagnosis, moderate pathology	Clinical studies confirm diagnosis, severe pathology	Clinical studies confirm diagnosis, very severe pathology
Shoulder			Clinical studies confirm one of the following symptomatic diagnoses: rotator cuff tear, SLAP or other labral lesion, biceps tendon pathology		Clinical studies confirm more than one of the following symptomatic diagnoses: rotator cuff tear, SLAP or other labral lesion, biceps tendon pathology. The most significant diagnosis is the only one rated.

NOT Stated, BUT Logically
This same concept should apply
To the digit, wrist, and elbow.

Page 410

TABLE 15-9

Clinical Studies Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Imaging Studies	No available clinical studies or relevant findings	Clinical studies confirm diagnosis, mild pathology	Clinical studies confirm diagnosis, moderate pathology	Clinical studies confirm diagnosis, severe pathology	Clinical studies confirm diagnosis, very severe pathology
X rays					
Arthritis		Cartilage interval normal or mild joint space narrowing and/or osteophytes	Cartilage interval: moderate joint space narrowing with cystic changes on 1 or both sides of joint and/or osteophytes; radiographic evidence of mild posttraumatic arthrosis; avascular necrosis without collapse	Cartilage interval severe joint space narrowing with cystic changes on both sides of joint and/or osteophytes; or avascular necrosis with bony collapse/ fragmentation	No cartilage interval; radiographic evidence of severe posttraumatic arthrosis

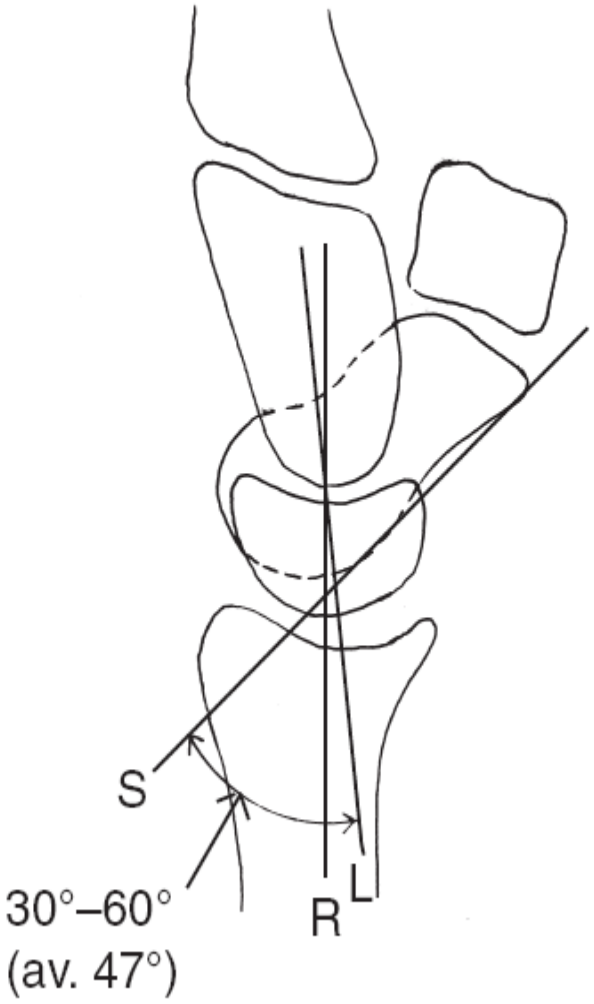
TABLE 15-9

Clinical Studies Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Imaging Studies	No available clinical studies or relevant findings	Clinical studies confirm diagnosis, mild pathology	Clinical studies confirm diagnosis, moderate pathology	Clinical studies confirm diagnosis, severe pathology	Clinical studies confirm diagnosis, very severe pathology
Joint laxity (based on stress testing)		<10° Instability	10°–20° Instability	20°–30° Instability	>30° Instability
Wrist (see text for explanation)		Radiolunate angle 11°–20° Scapholunate angle 61°–70° Scapholunate gap 3–5 mm Triquetrolunate stepoff >1 mm Ulnar translation mild	Radiolunate angle 21°–30° Scapholunate angle 71°–80° Scapholunate gap 6–8 mm Triquetrolunate stepoff >2 mm Ulnar translation moderate	Radiolunate angle >30° Scapholunate angle >80° Scapholunate gap >8 mm Triquetrolunate stepoff >3 mm Ulnar translation severe	

FIGURE 15-3

Techniques for Measuring the Scaphoid (S), Lunate Axis (L), and Long Axis of the Radius (R) and Corresponding Angles.



Source: David M. Lichtman, Fort Worth, Texas.

HOW to measure

- PAGE 409

TABLE 15-9

Pages 410 - 411

Clinical Studies Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Nerve Conduction Testing	Normal	Conduction delay (sensory and/or motor)	Motor conduction block	Partial axonal loss	Total axonal loss/denervation
Electrodiagnostic Testing *Note:* If the EMG test results meet some of, but not all of, the criteria for a specific class, the next lower class is the class to be used in rating the impairment	Normal	Needle EMG done at least 3 wk but less than 9 mo after injury shows at least 1+ fibrillation potentials and positive waves in at least 2 muscles innervated by the injured nerve. If the EMG study is first done more than 9 mo post injury, the exam shows high-amplitude polyphasic muscle potentials in at least 1 muscle and recruitment in that muscle is at least mildly reduced.	Needle EMG done at least 3 wk but less than 9 mo after injury shows at least 2+ fibrillation potentials and positive waves in at least 2 muscles innervated by the injured nerve. If the EMG study is first done more than 9 mo post injury, the exam shows high-amplitude polyphasic muscle potentials in at least 2 muscles and recruitment in those muscles is at least moderately decreased.	Needle EMG done at least 3 wk but less than 9 mo after injury shows at least 3+ fibrillation potentials and positive waves in at least 3 muscles innervated by the injured nerve. If the EMG study is first done more than 9 mo post injury, the exam shows high-amplitude polyphasic muscle potentials in at least 3 muscles and recruitment in those muscles is severely decreased.	Needle EMG done at least 3 wk but less than 9 mo after injury shows at least 4+ fibrillation potentials and positive waves in at least 3 muscles innervated by the injured nerve. If the EMG study is first done more than 9 mo post injury, the exam shows no motor units (fibrofatty replacement of muscle) in at least 2 muscles.

Special Instructions: Conversion

- As in previous editions, digital impairments are related to [Converted to] impairments of the hand, then upper extremity and whole person using the **appropriate tables**. Similarly, elbow and shoulder ratings are provided as upper extremity, then converted to body as a whole (390)

TABLE 15-11

Impairment Values Calculated From Upper Extremity Impairment

% Impairment					
Whole Person	Upper Extremity	Hand	Thumb	Index and Middle Finger	Ring and Small Finger
0	0	0	0	0	0
Mild					
1	1	1	3	6	11
1	2	2	6	11	22
2	3	3	8	17	33
2	4	4	11	22	44
3	5	6	14	28	56
4	6	7	17	33	67
4	7	8	19	39	78
5	8	9	22	44	89
5	9	10	25	50	100
6	10	11	28	56	
7	11	12	31	60	
7	12	13	33	65	
8	13	14	36	70	
Moderate					
8	14	16	39	80	
9	15	17	42	85	
10	16	18	44	90	
10	17	19	47	95	
11	18	20	50	100	
11	19	21	53		
12	20	22	56		
13	21	23	58		
13	22	24	61		
14	23	26	64		
14	24	27	67		
15	25	28	69		
Severe					
16	26	29	72		
16	27	30	75		
17	28	31	78		
17	29	32	81		
18	30	33	83		
19	31	34	86		
19	32	36	89		
20	33	37	92		
20	34	38	94		
21	35	39	97		
22	36	40	100		
22	37	41			
23	38	42			
23	39	43			
24	40	44			
25	41	46			
25	42	47			
26	43	48			
26	44	49			
27	45	50			
28	46	51			
28	47	52			
29	48	53			
29	49	54			

% Impairment					
Whole Person	Upper Extremity	Hand	Thumb	Index and Middle Finger	Ring and Small Finger
Very Severe					
30	50	56			
31	51	57			
31	52	58			
32	53	59			
32	54	60			
33	55	61			
34	56	62			
34	57	63			
35	58	64			
35	59	65			
35	59	66			
36	60	67			
37	61	68			
37	62	69			
38	63	70			
38	64	71			
39	65	72			
40	66	73			
40	67	74			
41	68	75			
41	68	76			
41	69	77			
42	70	78			
43	71	79			
43	72	80			
44	73	81			
44	74	82			
45	75	83			
46	76	84			
46	77	85			
46	77	86			
47	78	87			
47	79	88			
48	80	89			
49	81	90			
49	82	91			
50	83	92			
50	84	93			
51	85	94			
52	86	95			
52	86	96			
52	87	97			
53	88	98			
53	89	99			
54	90	100			
55	91				
55	92				
56	93				
56	94				
57	95				
58	96				
58	97				
59	98				
59	99				
60	100				

Table 15-11
p 420

- One of 2 tables to convert impairments in this chapter
- No change in the values of the digits, hand, or upper extremity from the 1st -5th Editions

TABLE 15-11

Impairment Values Calculated From Upper Extremity Impairment

% Impairment					
Whole Person	Upper Extremity	Hand	Thumb	Index and Middle Finger	Ring and Small Finger
0	0	0	0	0	0
Mild					
1	1	1	3	6	11

0-11% Impairment of ring or little finger is a 1% hand, or a 1% UE, or a 1% WPI.

Table 15-12 pages 421-423

TABLE 15-12

Impairment Values Calculated From Digit Impairment

Note: To convert digit impairment to other units, identify the digit impairment value in the left-hand column, identify the digit (thumb, index, middle, ring, or little) in the top columns and the converted impairment values are shown based on unit (hand, upper extremity [UE], or whole person [WP]). Follow directions for combining, as directed in the text.

The conversion factor for upper extremity to whole person is 60%, for hand to upper extremity is 90%, thumb to hand is 40%, index and middle finger to hand is 20%, and ring and little finger to hand is 10%.

Digit Impairment Value	Thumb			Index or Middle Finger			Ring or Little Finger		
Digit Conversion Multiplier (digit to specified unit)	Hand	UE	WP	Hand	UE	WP	Hand	UE	WP
	40%	36%	22%	20%	18%	11%	10%	9%	5%
1	0	0	0	0	0	0	0	0	0
2	1	1	0	0	0	0	0	0	0
3	1	1	1	1	1	0	0	0	0
4	2	1	1	1	1	0	0	0	0
5	2	2	1	1	1	1	1	0	0
6	2	2	1	1	1	1	1	1	0
7	3	3	2	1	1	1	1	1	0
8	3	3	2	2	1	1	1	1	0
9	4	3	2	2	2	1	1	1	0
10	4	4	2	2	2	1	1	1	1

UE DBI Example - Wrist

39 yr old suffers FOOSH with distal radius fracture treated with ORIF.

Seen 4 months later doing “just okay” with complaints of pain with end extension.

Healed fracture on x-ray with no angulation or deformity. Back to normal work with no restrictions.

At MMI with **tenderness** to palpation distal radius, but normal ROM and strength.

QuickDASH administered with score of 38, thought by examiner to be valid.

UE DBI Wrist Example

First step =

Diagnosis

Page 396

Second step

Find Class =

Class 1

with default IR

= 3% UE

TABLE 15-3 (CONTINUED) Wrist Regional Grid: Upper Extremity Impairments

IMPAIRMENT CLASS	CLASS 0	CLASS 1	CLASS 2	CLASS 3	CLASS 4
IMPAIRMENT RANGES (upper extremity %)	0	1%–13% UE	14%–25% UE	26%–49% UE	50%–100% UE
GRADE		A B C D E	A B C D E	A B C D E	A B C D E
LIGAMENT/BONE/JOINT*					
Wrist sprain/h/o dislocation* including carpal instability	0 No residual findings: +/− surgical treatment	6 7 8 9 10 Mild instability (grade modifier 1 per radiographic studies and criteria in Table 15-9) *(clinical studies excluded from adjustment process)*	14 15 16 17 18 Moderate instability (grade modifier 2 per radiographic studies and criteria in Table 15-9) 20 22 24 25 25 Severe instability (grade modifier 3 per radiographic studies and criteria in Table 15-9) *(clinical studies excluded from adjustment process)*		
Triangular fibrocartilage complex (TFCC) tear*	0 No residual findings: +/− surgical treatment	6 7 8 9 10 Documented TFCC injury +/− surgery with residual findings			
Fracture*	0 No residual findings: +/− surgical treatment	1 2 3 4 5 Residual symptoms, consistent objective findings and/or functional loss, with normal motion			

UE DBI Example Wrist

Third Step =

Evaluate Non key adjustment factors

FH = QuickDASH of 38

PE = Basically normal

CS = Not applicable as defines Class

UE DBI Example Wrist

FH = Grade 1

TABLE 15-7

Functional History Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
	Asymptomatic	Pain/symptoms with strenuous/vigorous activity; +/− medication to control symptoms	Pain/ symptoms with normal activity; +/− medications to control symptoms	Pain/symptoms with less than normal activity (minimal); +/- medications to control symptoms	Pain/symptoms at rest; +/− medications to control symptoms
		Able to perform self-care activities independently	Able to perform self-care activities with modification but unassisted	Requires assistance to perform self-care activities	Unable to perform self-care activities
***Quick*DASH Score**	0–20	21–40	41–60	61–80	81–100

UE DBI Example Wrist

PE = Grade 0

Some may say Grade 1: depends on how you classify "minimal palpatory findings"

TABLE 15-8

Physical Examination Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Observed and Palpatory Findings (tenderness, swelling, mass, or crepitance)	No consistent findings	Minimal palpatory findings, consistently documented, without observed abnormalities	Moderate palpatory findings, consistently documented, and supported by observed abnormalities	Severe palpatory findings, consistently documented, and supported by observed moderate or greater abnormalities	Very severe palpatory findings, consistently documented, and supported by observed severe abnormalities
Stability	Stable	Grade 1 (slight) instability	Grade 2 (moderate) instability	Grade 3 (serious) instability	Gross instability
Hand/finger/thumb		Pain with stressing of ligament, but no opening of joint with stress	Pain and slight opening	Pain and >5 mm of joint opening with stress	Severe instability
Wrist		Clicking or clunking by history, but not reproducible	Clicking or clunking by history, and reproducible on physical examination		
Wrist excessive passive/active mediolateral joint deviation degrees compared to normal		<10° passive <20° active	10°–20° passive 20°–30° active	>20° passive >30° active	
Shoulder		No history of acute trauma; consistent relationship of symptoms with activity and ROM; +/- reproducible symptoms with stability testing; GH translation classes I + II; no demonstrable lesion	History of acute trauma; consistent relationship of symptoms with activity and ROM; reproducible symptoms with stability testing; GH translation class II; demonstrable etiologic anatomic lesion	History of acute trauma; consistent relationship of symptoms with activity and ROM; reproducible symptoms with stability testing; GH translation class III; demonstrable etiologic anatomic lesion	
Alignment/ Deformity	Normal for individual with symmetry to opposite side	Mild	Moderate	Severe	Very severe
Range of Motion (reference Section 15.7)	None	Mild (10%–19% decrease from normal or uninjured opposite side) For digit impairments only, this reflects a total digit impairment <20% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of <12% upper extremity impairment.	Moderate (20%–39% decrease from normal or uninjured opposite side) For digit impairments only, this reflects a total digit impairment of 20% to 39% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of 12% to 23% upper extremity impairment.	Severe (40%–70% decrease from normal or uninjured opposite side) For digit impairments only, this reflects a total digit impairment of 40% to 70% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of 24% to 42% upper extremity impairment.	Very severe (>70% decrease from normal or uninjured opposite side) For digit impairments only, this reflects a total digit impairment >70% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment >42% upper extremity impairment.
Muscle Atrophy (asymmetry compared to opposite normal)	<1 cm	1.0–1.9 cm	2.0–2.9 cm	3.0 cm–3.9 cm	4.0 cm +

Note: ROM indicates range of motion; GH indicates Glenohumeral.

Physical Exam: Only Palpatory Findings apply (Tenderness)

- No criteria to determine what is "minimal" versus "moderate", versus "severe" tenderness

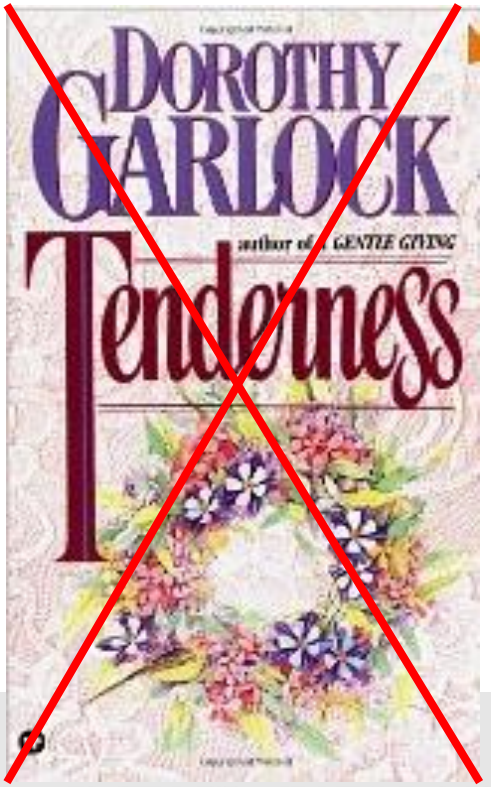


TABLE 15-8

Physical Examination Adjustment: Upper Extremities

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Observed and Palpatory Findings (tenderness, swelling, mass, or crepitance)	No consistent findings	Minimal palpatory findings, consistently documented, without observed abnormalities	Moderate palpatory findings, consistently documented, and supported by observed abnormalities	Severe palpatory findings, consistently documented, and supported by observed moderate or greater abnormalities	Very severe palpatory findings, consistently documented, and supported by observed severe abnormalities

UE DBI Example Wrist

Net Adjustment Calculation

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

(1-1) + (0-1) + (n/a) = (-1)

Grade B with final rating of 2% UE

Fracture*	0 No residual findings: +/− surgical treatment	1 2 3 4 5 Residual symptoms, consistent objective findings and/or functional loss, with normal motion

Amputation

- Section 15.6
- Up to 70% WPI to include forequarter amputation (scapulothoracic)
- Table15-28, p 457
- Addition of amputation related conditions includes pulp loss or tender scar in a digit, adjacent joint contractures (10% **digit** impairment)

amputations

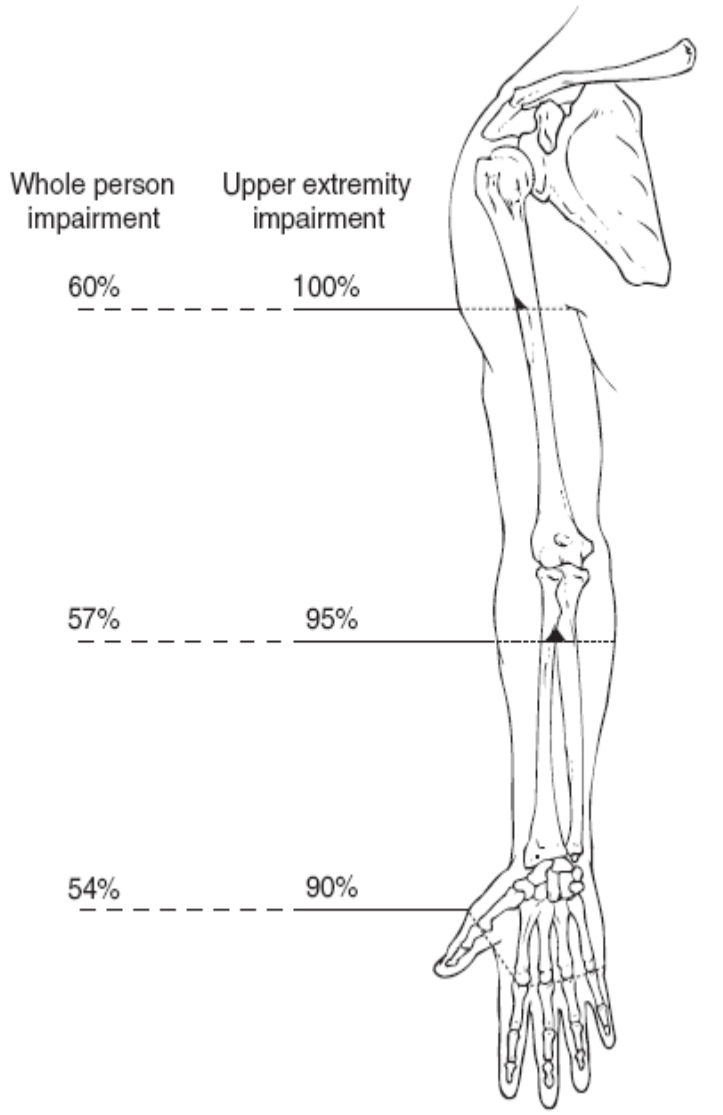
- Impairment values **include** pain, discomfort, cold intolerance, abnormal soft tissue configurations of the stump
- Additional impairment for these **not** given thru level of metacarpals
- Additional rating may be provided for digital neuromas

amputations

- May get additional ratings for disabling phantom pain or more **proximal peripheral nerve injury,** if well documented. (pg 458)
  - Do NOT rate neuro deficit in amputated part
  - Amputation rating includes loss of all functions in amputated part (including neuro)
- Range of motion deficits for the **remaining** portion of the limb may be **combined with** the amputation impairment.

FIGURE 15-9

Impairment Estimates for Upper Extremity Amputation at Various Levels



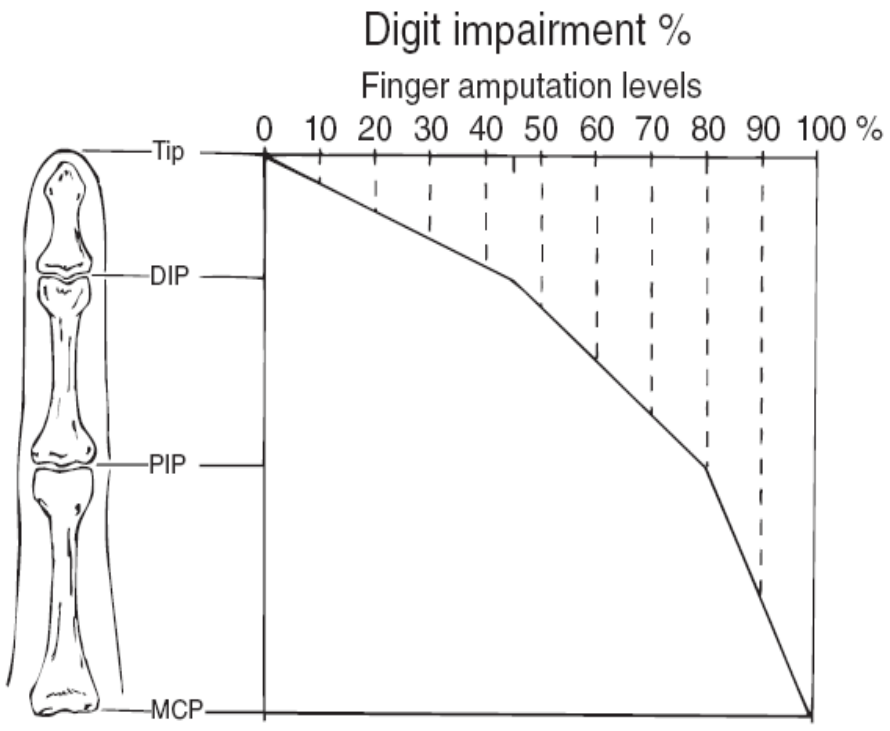
P 456

- Use for Proximal Amputations

P 458

FIGURE 15-12

Digit Impairment Percent for Finger Amputation at Various Levels



Redrawn with permission from Swanson AB. Evaluation of impairment of function in the hand. *Surg Clin North Am.* 1964;44:925–940

FIGURE 15-11

Digit Impairment Percent for Thumb Amputation at Various Levels

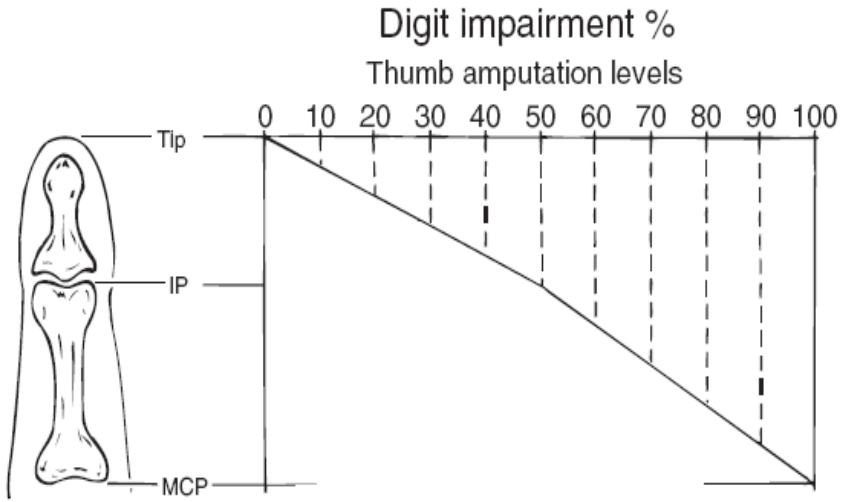


TABLE 15-28

Impairment for Upper Limb Amputation at Various Levels

Amputation Level	Digit	Impairment %		
		Hand	Upper Extremity	Whole Person
Thumb at:				
IP joint	50	20	18	11
MCP joint	100	40	36	22
Half metacarpal		41	37	22
Metacarpal at CMC		42	38	23
Index or Middle Finger at:				
DIP joint	45	9	8	5
PIP joint	80	16	14	9
MCP joint	100	20	18	11
Half metacarpal		21	19	11
Metacarpal at CMC		22	20	12
Ring or Little Finger at:				
DIP joint	45	5	5	3
PIP joint	80	8	7	4
MP joint	100	10	9	5
Half metacarpal		12	11	7
Metacarpal at CMC		13	12	7
Hand: all fingers at MP joints except thumb	—	60	54	32
Hand: all digits at MP joints	—	100	90	54
Forearm/hand: from distal to bicipital insertion to transmetacarpophalangeal loss of all digits	—	—	94–90	56–54
Arm/forearm: from distal to deltoid insertion to bicipital insertion	—	—	95	57
Arm: deltoid insertion and proximally	—	—	100	60
Shoulder disarticulation	—	—	100	60
Scapulothoracic (forequarter)	—	—		70

IP indicates interphalangeal; MCP, metacarpophalangeal; CMC, carpometacarpal, DIP, distal interphalangeal; and PIP, proximal interphalangeal.

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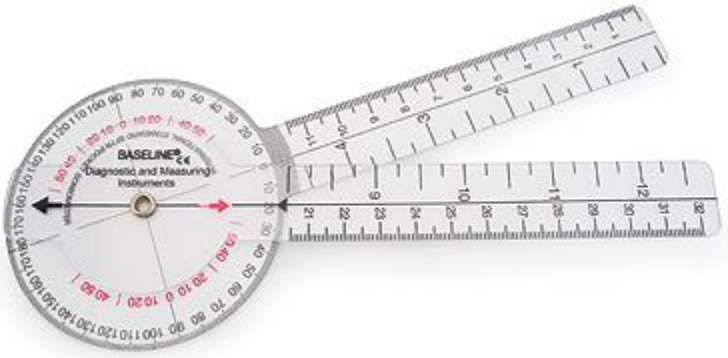
Use for Distal, or ANY amputation

Range of Motion



P 462-463

FIGURE 15-13
Upper Extremity Range of Motion Record

Name _____
File No. _____

Date _____
Dominant Side __Right __Left __Ambidextrous
Injured Side __Right __Left __Bilateral

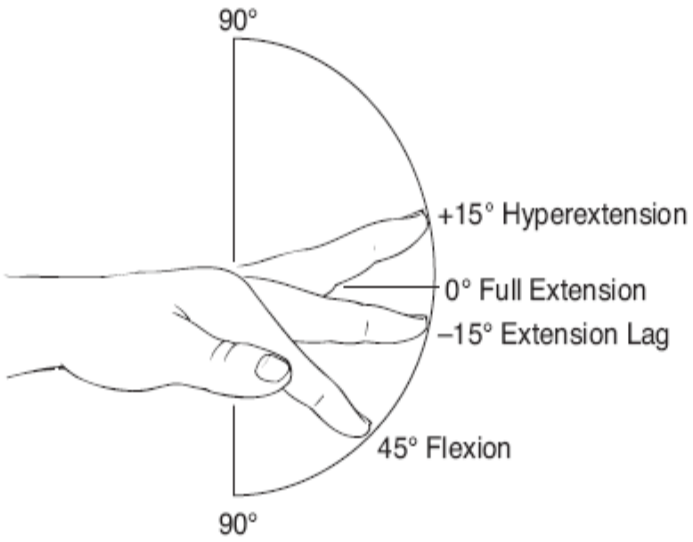
				Right __Injured __Uninjured			Left __Injured __Uninjured			Impaired __Right __Left	
		Motion	Normal	Motion	Impairment		Motion	Impairment		Impairment	
Thumb											
	IP	Flexion	≥80°			% Digit		% Digit			% Digit
		Extension	≥+10°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	MCP	Flexion	≥60°			% Digit		% Digit			% Digit
		Extension	≥0°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	CMC	Adduction	≤2 cm			% Digit		% Digit			% Digit
		Radial Abduction	≥50°			% Digit		% Digit			% Digit
		Opposition	≥7			% Digit		% Digit			% Digit
		Add All CMC				% Digit		% Digit			% Digit
	Total	Add IP, MP, CMC				% Digit		% Digit			% Digit
		Convert to Hand				% Hand		% Hand			% Hand
Index		Motion	Normal	Motion	Impairment		Motion	Impairment		Impairment	
	DIP	Flexion	≥70°			% Digit		% Digit			% Digit
		Extension	≥0°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	PIP	Flexion	≥100°			% Digit		% Digit			% Digit
		Extension	≥0°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	MCP	Flexion	≥90°			% Digit		% Digit			% Digit
		Extension	≥+20			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	Total	Combined DIP, PIP and MP				% Digit		% Digit			% Digit
		Convert to Hand				% Hand		% Hand			% Hand
Middle		Motion	Normal	Motion	Impairment		Motion	Impairment		Impairment	
	DIP	Flexion	≥70°			% Digit		% Digit			% Digit
		Extension	≥0°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	PIP	Flexion	≥100°			% Digit		% Digit			% Digit
		Extension	≥0°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	MCP	Flexion	≥90°			% Digit		% Digit			% Digit
		Extension	≥+20			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	Total	Combined DIP, PIP and MP				% Digit		% Digit			% Digit
		Convert to Hand				% Hand		% Hand			% Hand
Ring		Motion	Normal	Motion	Impairment		Motion	Impairment		Impairment	
	DIP	Flexion	≥70°			% Digit		% Digit			% Digit
		Extension	≥0°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	PIP	Flexion	≥100°			% Digit		% Digit			% Digit
		Extension	≥0°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	MCP	Flexion	≥90°			% Digit		% Digit			% Digit
		Extension	≥+20			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	Total	Combined DIP, PIP and MP				% Digit		% Digit			% Digit
		Convert to Hand				% Hand		% Hand			% Hand
Little		Motion	Normal	Motion	Impairment		Motion	Impairment		Impairment	
	DIP	Flexion	≥70°			% Digit		% Digit			% Digit
		Extension	≥0°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	PIP	Flexion	≥100°			% Digit		% Digit			% Digit
		Extension	≥0°			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	MCP	Flexion	≥90°			% Digit		% Digit			% Digit
		Extension	≥+20			% Digit		% Digit			% Digit
		Add Flexion & Extension				% Digit		% Digit			% Digit
	Total	Combined DIP, PIP and MP				% Digit		% Digit			% Digit
		Convert to Hand				% Hand		% Hand			% Hand
Total Hand		Add All Hand % for All Digits				% Hand		% Hand			% Hand
		Convert to Upper Extremity				% UE		% UE			% UE
Wrist		Motion	Normal	Motion	Impairment		Motion	Impairment		Impairment	
		Flexion	≥60°			% UE		% UE			% UE
		Extension	≥60°			% UE		% UE			% UE
		Add Flexion & Extension				% UE		% UE			% UE
		Radial Deviation	≥20°			% UE		% UE			% UE
		Ulnar Deviation	≥30°			% UE		% UE			% UE
		Add Radial & Ulnar				% UE		% UE			% UE
	Total	Add All Wrist				% UE		% UE			% UE
Elbow		Motion	Normal	Motion	Impairment		Motion	Impairment		Impairment	
		Flexion	≥140°			% UE		% UE			% UE
		Extension	≥0°			% UE		% UE			% UE
		Add Flexion & Extension				% UE		% UE			% UE
		Pronation	≥80°			% UE		% UE			% UE
		Supination	≥80°			% UE		% UE			% UE
		Add Pronation and Supination				% UE		% UE			% UE
	Total	Add All Elbow				% UE		% UE			% UE
Shoulder		Motion	Normal	Motion	Impairment		Motion	Impairment		Impairment	
		Flexion	≥60°			% UE		% UE			% UE
		Extension	≥60°			% UE		% UE			% UE
		Add Flexion & Extension				% UE		% UE			% UE
		Abduction	≥170°			% UE		% UE			% UE
		Adduction	≥40°			% UE		% UE			% UE
		Add Abduction & Adduction				% UE		% UE			% UE
		Internal Rotation	≥80°			% UE		% UE			% UE
		External Rotation	≥60°			% UE		% UE			% UE
		Add Rotations				% UE		% UE			% UE
	Total	Add All Shoulder				% UE		% UE			% UE
Combined		Combine Hand, Wrist, Elbow and Shoulder				% UE		% UE			% UE
		Convert to Whole Person				% WP		% WP			% WP

Section 15.7: ROM

FIGURE 15-14

Measurement of MCP Joint Position in Flexion, Extension Lag, full extension, and Hyperextension

Full extension or the neutral position is considered to be 0°.



Redrawn with permission from Swanson AB. Evaluation of impairment of function in the hand. *Surg Clin North Am.* 1964;44:925–940.

- Nomenclature used in ROM tables
  - **Minus = extension lag**
  - Plus = hyperextension
  - **NOT mathematical notations**

6th Edition: ROM

15.7b International Classification of Functioning Range of Motion Model

To facilitate reproducibility and to adjust to the ICF Model of impairment, the Sixth Edition of the *Guides* reflects motion loss as grade modifiers, as shown in the following table.

Grade Modifier	Severity	Range of Motion
0	Normal	
1	Mild	60%–90% of normal motion (average: 75% of normal motion)
2	Moderate	30%–60% of normal motion (average: 45% of normal motion)
3	Severe	<30% of normal motion (average: 15% of normal motion)
4	Very severe	Joint ankylosis

- "Swanson" PIE charts are **GONE**
- **ROM VARIES** day to day, as does body weight, blood pressure, temperature

Figures show how to measure

FIGURE 15-15 Neutral Position (top) and Flexion (bottom) of Thumb IP Joint

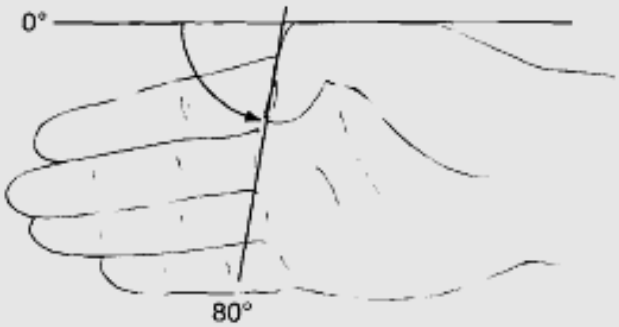


FIGURE 15-16 Flexion of Thumb MCP Joint

FIGURE 15-18 Thumb Radial Abduction

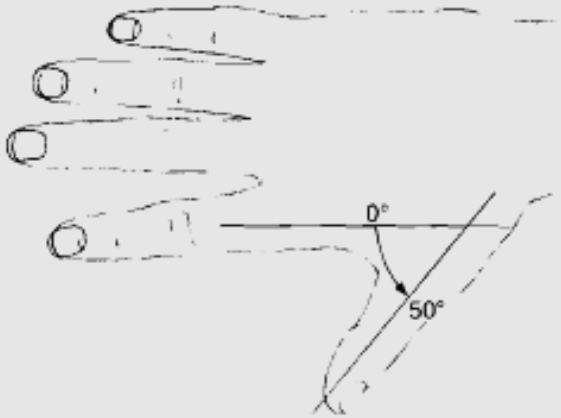
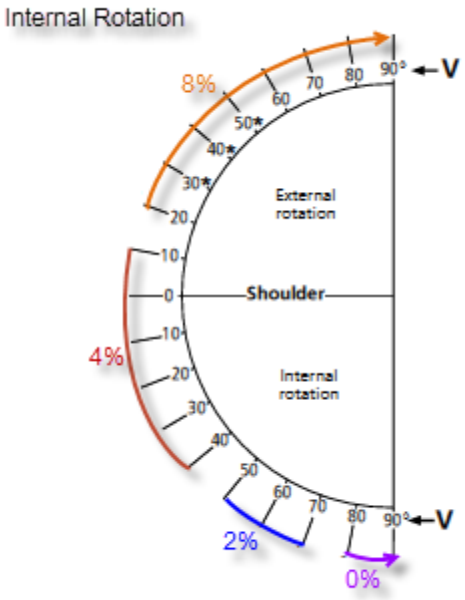


FIGURE 15-19 Adduction of Thumb

Table compared to OLD Pie Charts

Grade Modifier		0	1	2	3	4
Severity		None (Normal)	Mild	Moderate	Severe	Ankylosis
Shoulder	20% Shoulder					
Internal rotation (IR)	Motion° = % Upper Extremity Impairment (% UEI)	≥80° IR = 0% UEI	50° IR to 70° IR = 2% UEI	10° ER to 40° IR = 4% UEI	≥20° ER = 8% UEI	20° to 50° IR = 6% UEI ≥ 60° IR or 10° IR to ER = 0% UEI
External Rotation (ER)		≥60° ER = 0% UEI	50° ER to 30° IR = 2% UEI	50° IR to 40° IR = 4% UEI	≥60° IR = 9% UEI	



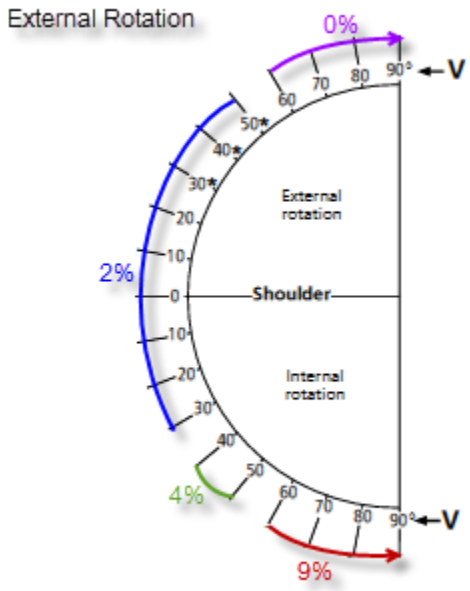


TABLE 15-30

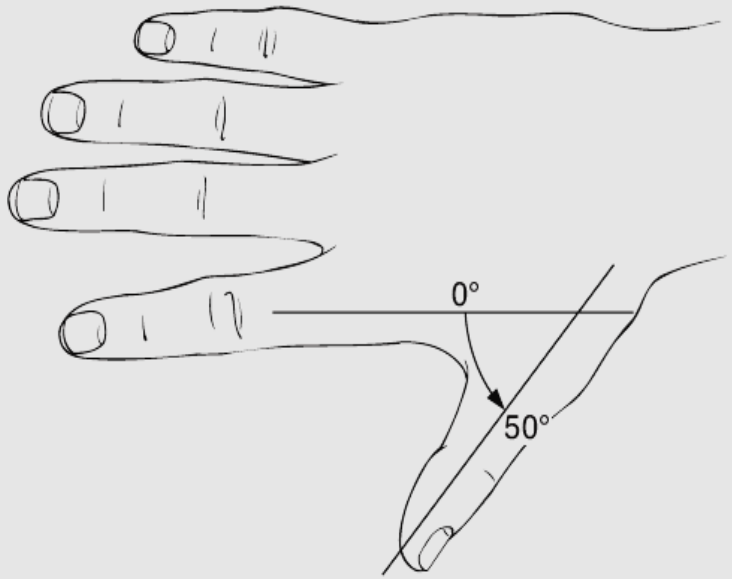
Thumb Range of Motion

Grade Modifier		0	1	2	3	4
Severity		**None (Normal)**	**Mild**	**Moderate**	**Severe**	**Ankylosis**
Motion (percentage compared to normal)		**≥90%**	**61% to 90%**	**31% to 60%**	**≤30%**	
Joint						
IP	15% Thumb					
Flexion	Motion° = % Thumb Impairment (% DI) (compared to normal)	≥80° = 0%	60° to 70° = 1% DI	50° to 30° = 3% DI	≤20° = 6% DI	20° = 7% DI +10° to 10 or 30° to 40° = 9% DI ≥+10 or ≤50° = 13% DI
Extension		≥+10° = 0%	0 = 1% DI	10° to 30° = 3% DI	>30° = 6% DI	
MCP	10% Thumb					
Flexion	Motion° = % Thumb Impairment (% DI)	≥60° = 0%	40° to 50° = 2% DI	30° to 20° = 4% DI	≤10° = 5% DI	20° = 5% DI +10° to 10 or 30° to 40° = 7% DI ≥+10° or ≤50° = 9% DI
Extension		≥0° = 0%	10° to 20° = 1% DI	30° to 40° = 4% DI	≤10° = 5% DI	
CMC	75% Thumb					
Adduction	Motion° = % Thumb Impairment (% DI)	≤2 cm = 0%	3 to 5 cm = 4% DI	5 to 7 cm = 8% DI	≥8 cm = 20% DI	4 cm = 10% DI ≤3 cm or ≥5 cm = 15% DI
Radial Abduction		≥50° = 0%	40° = 2% DI	30° = 5% DI	≤20° = 10% DI	30° –40° = 6 % DI ≤20° or ≥50° = 10% DI
Opposition		≥7 cm = 0%	5 to 6 cm = 4% DI	3 to 4 cm = 9% DI	2 cm = 20% DI ≤1 cm = 40% DI	5 cm = 22% DI 4 cm or ≥6 cm = 27% DI ≤3 cm = 40% DI

Note: IP indicates interphalangeal; DI, digit impairment; MCP, ; and CMC, carpometacarpal.

FIGURE 15-18

Thumb Radial Abduction, Measuring (in degrees) the Angle of Separation Formed Between First and Second Metacarpals in Coronal Plane



between the first and second metacarpals in the coronal plane, as in Figure 15-18. The stationary arm of the goniometer is aligned over the second metacarpal and the movable arm over the first metacarpal. The normal angle of radial abduction is 50°. Note that in full radial adduction, the smallest angle of separation is 15° due to anatomic configurations. The relative

FIGURE 15-19

Adduction of Thumb, Measured (cm) From the Flexion Crease of Thumb IP Joint to Distal Palmar Crease Over the Level of MP Joint of Little Finger

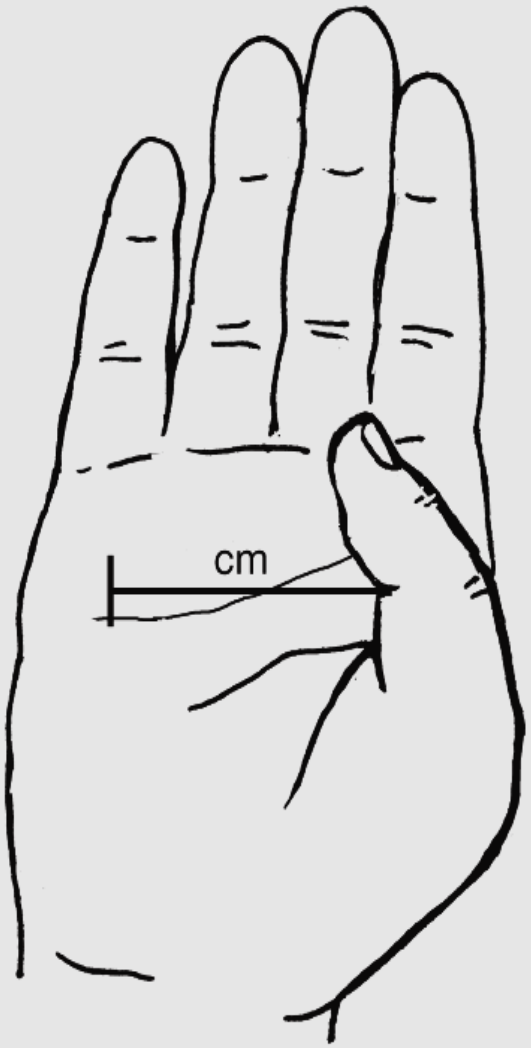
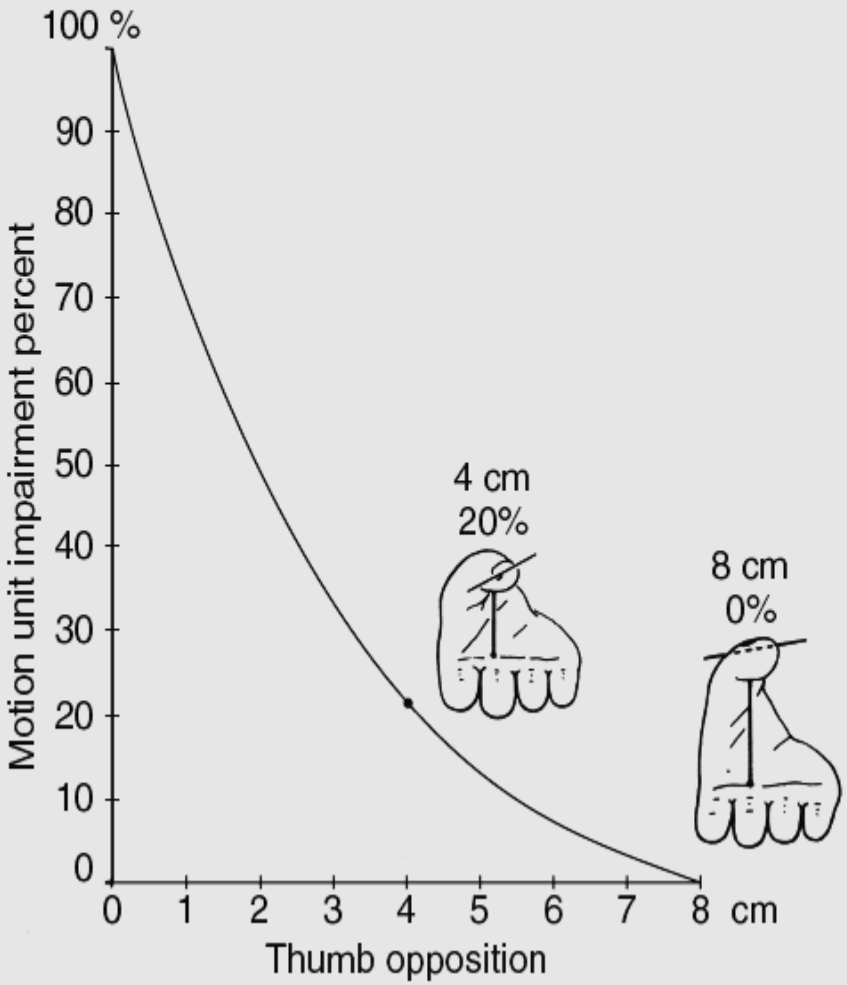


FIGURE 15-20

Linear Measurements of Thumb Opposition (cm) at Various Positions

Motion unit impairment curve for lack of opposition.



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Finger ROM: P 470-471

FIGURE 15-21

Neutral Position (top) and Flexion (bottom) of Finger DIP Joint

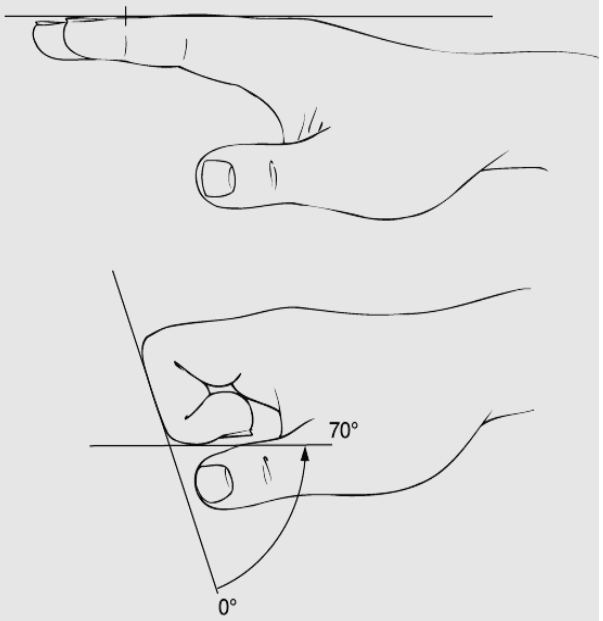

FIGURE 15-22

Neutral Position (top) and Flexion (bottom) of Finger PIP Joint (isolated joint measurement shown)

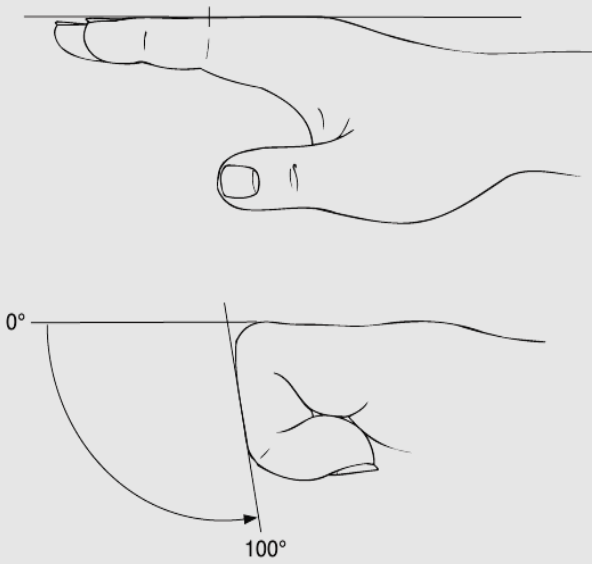

FIGURE 15-23

Neutral Position (top) and Flexion (bottom) of Finger MCP Joint (total active range of motion measurement shown)

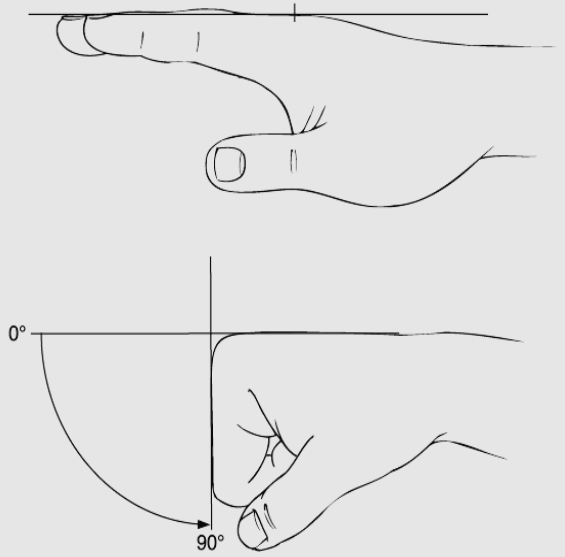

TABLE 15-31

Finger Range of Motion

Grade Modifier		0	1	2	3	4
Severity		**None (Normal)**	**Mild**	**Moderate**	**Severe**	**Ankylosis**
Motion (percentage compared to normal)		**≥90%**	**61% to 90%**	31% to 60%	**≤30%**	
Joint						
DIP	45% Finger					
Flexion	Motion° = % Digit Impairment (% DI)	≥70° = 0%	40° to 60° = 10% DI	10° to 30° = 25% DI	<10° = 40% DI	−20° = 30% DI +10° to −10° or −30° to −50° = 35% DI ≥+20° or ≤−60° = 45% DI
Extension		≥0° = 0%	−10° to −20° lag = 2% DI	−30° to −40° lag = 12% DI	≤−50 ° lag = 32% DI	
PIP	80% Finger					
Flexion	Motion° = % Digit Impairment (% DI)	≥100° = 0%	90° = 6% DI 50°–80° = 21% DI	20°–40° = 42% DI	≤10° = 54% DI	−40° = 50% DI +10° to −10 or −50° to −70° = 60) ≥+20° or ≤−80° = 80% DI
Extension		≥0° = 0%	<−10° lag = 3% DI	−10° to −50° lag = 14% DI	≤−60° lag = 58% DI	
MCP	100% Finger					
Flexion	Motion° = % Digit Impairment (% DI)	≥90° = 0%	80° = 6% DI 40°–70° = 19% DI	20°–30° = 35% DI	≤10° = 48% DI	−30° = 45% DI ≥−30° or −40° to −60° = 60% DI ≤−70° = 90% DI
Extension		≥+20° = 0%	+10° to −20° lag = 7% DI	−30° to −60° lag = 34% DI	≥−70° lag = 91% DI	

Note: IP indicates interphalangeal; DI, digit impairment; MP, ; and CMC, carpometacarpal.

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Wrist ROM

FIGURE 15-24
Wrist Flexion (above) and Extension (below)

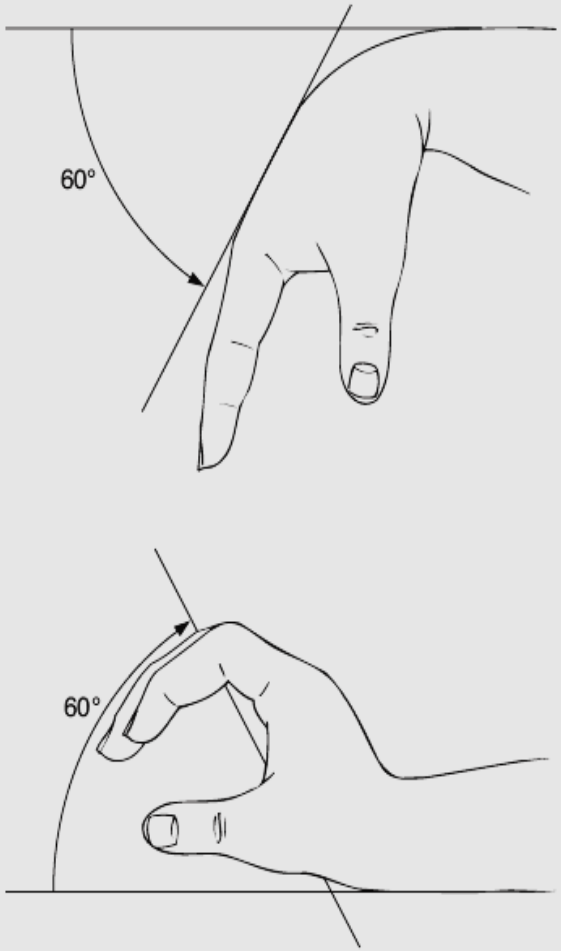


FIGURE 15-25
Radial Deviation (left) and Ulnar Deviation (right) of the Right Wrist

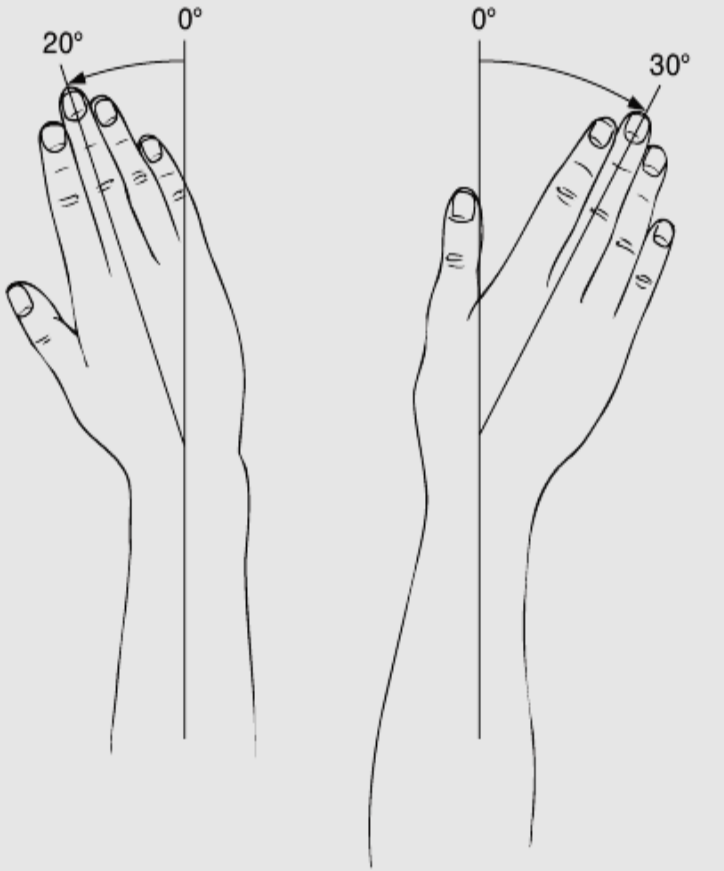


TABLE 15-32

Wrist Range of Motion

Grade Modifier		0	1	2	3	4
Severity		**None (Normal)**	**Mild**	**Moderate**	**Severe**	**Ankylosis**
Motion (percentage compared to normal)		≥90%	61% to 90%	31% to 60%	≤30%	
Joint						
Wrist	70% Wrist					
Flexion	Motion° = % Upper Extremity Impairment (% UEI)	≥60° = 0%	30° to 50° = 3% UEI	20° = 7% UEI	≤10° = 9% UEI	−10° to + 10° = 21% UEI +20° to +40° or −20° to −40° = 25% UEI ≥+50° or ≤50° = 40% UEI
Extension		≥60° = 0%	30° to 50° = 3% UEI	20° = 7% UEI	≤10° = 9% UEI	
Wrist	30% Wrist					
Radial Deviation	Motion° = % Upper Extremity Impairment (% UEI)	≥20° = 0%	10° = 2% UEI	0° = 4% UEI	≤10 ulnar deviation = 12 % UEI	0° to 10° ulnar deviation = 9% UEI 10° radial deviation or 20° ulnar deviation = 14% UEI ≥20° radial deviation or ≥30° ulnar deviation = 18% UEI
Ulnar Deviation		≥30° = 0%	20° = 2% UEI	10° to 0 ° = 4% UEI	≥10 radial deviation = 12% UEI	

Elbow ROM

FIGURE 15-26

Flexion and Extension of Elbow

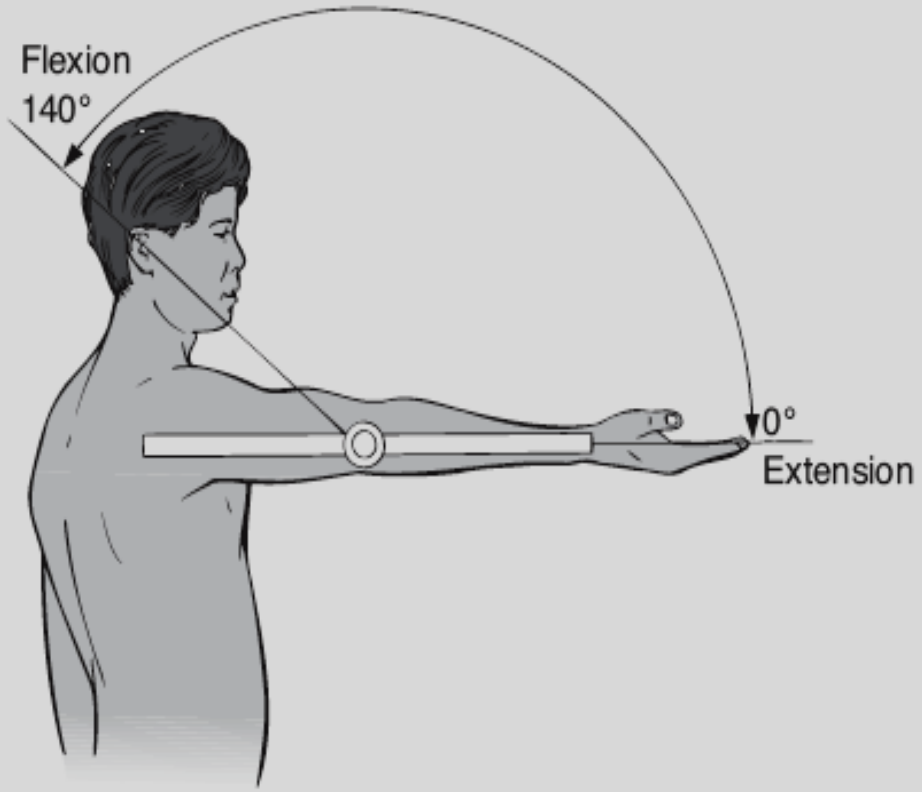


FIGURE 15-27

Pronation and Supination of Forearm

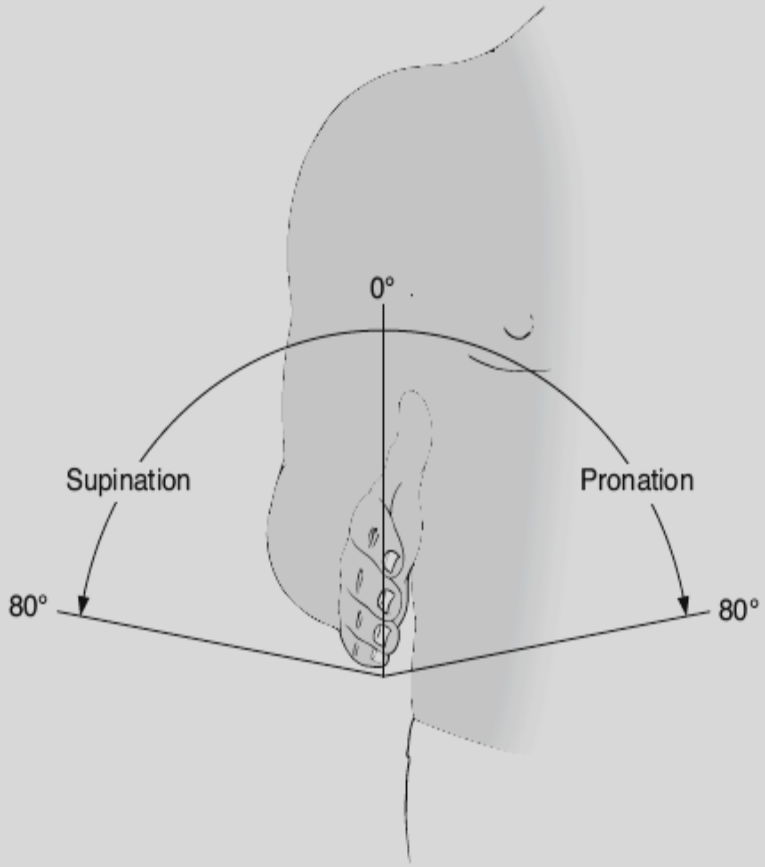


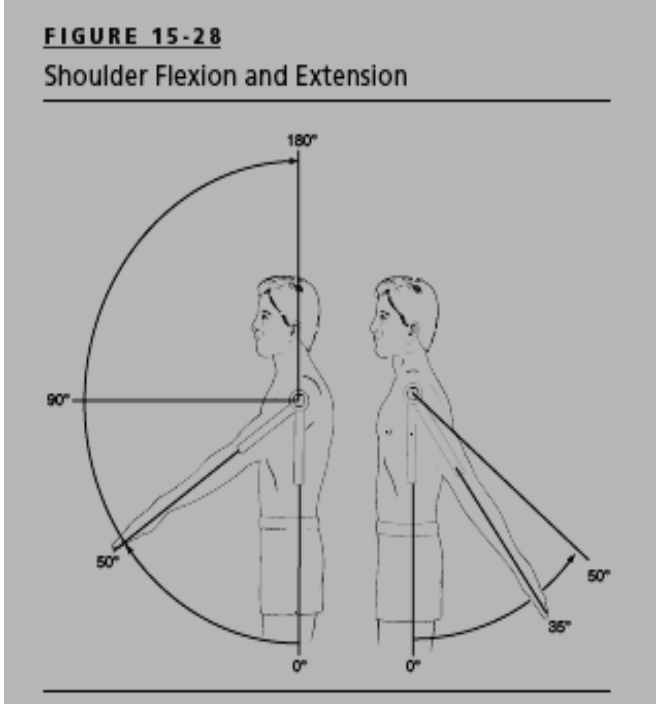
TABLE 15-33

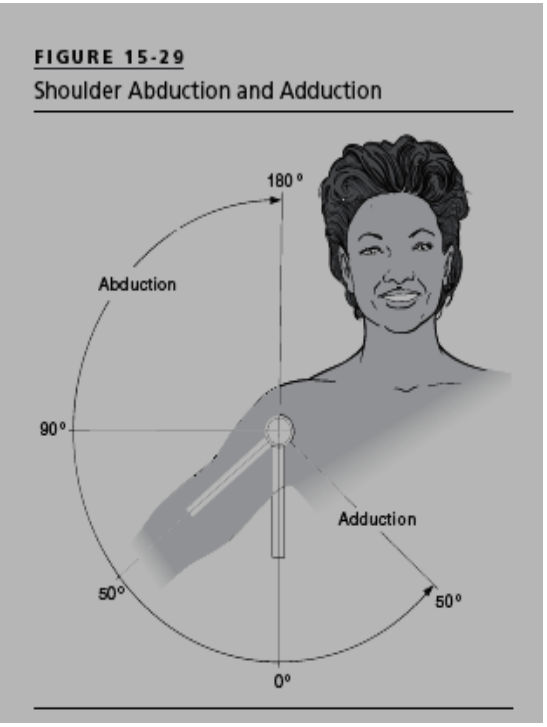
Elbow/Forearm Range of Motion

Grade Modifier		0	1	2	3	4
Severity		**None (Normal)**	**Mild**	**Moderate**	**Severe**	**Ankylosis**
Motion (percentage compared to normal)		≥90%	61% to 90%	31% to 60%	≤30%	
Joint						
Elbow	60% Elbow					
Flexion	Motion° = % Upper Extremity Impairment (% UEI)	≥140° = 0%	110° to 130° = 3% UEI 70° to 100° = 8% UEI	60° to 20° = 27% UEI	≤10° = 40% UEI	80° = 21% UEI 50° to 70° or 90° to 100° = 25% UEI ≤40° or ≥110° 38% UEI
Extension		0° = 0%	10° to 40° lag = 2% UEI 50° to 60 lag = 5% UEI	70° to 90° lag = 11% UEI	≥90° lag = 30% UEI	
Forearm	40% Elbow					
Pronation	Motion° = % Upper Extremity Impairment (% UEI)	≥80° = 0%	70° to 50° = 1% UEI	40° to 20° = 3% UEI	≤10° = 10% UEI	20° pronation = 8% UEI 30° to 60° pronation or 10° pronation to 20° supination = 15% UEI ≥70° pronation or ≥30° supination = 25% UEI
Supination		≥70° = 0%	60° to 50° = 1% UEI	40° to 20° = 2% UEI	≤10° = 10% UEI	

Shoulder ROM

- NOT in Text
- Stabilize thorax
- Measure rotation if < 90□ of abduction





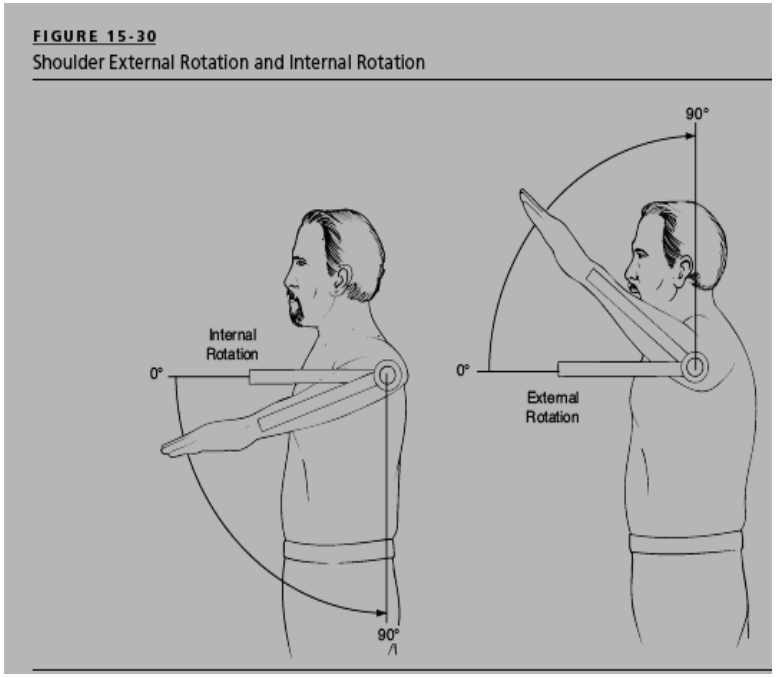


TABLE 15-34

Shoulder Range of Motion

Grade Modifier		0	1	2	3	4
Severity		**None (Normal)**	**Mild**	**Moderate**	**Severe**	**Ankylosis**
Motion (percentage compared to normal)		≥90%	61% to 90%	31% to 60%	≤30%	
Joint						
Shoulder	50% Shoulder					
Flexion	Motion° = % Upper Extremity Impairment (% UEI)	≥180° = 0%	90° to 170° = 3% UEI	20° to 80° = 9% UEI	≤10° = 16% UEI	20° to 40° flexion = 15% UEI 10° flexion to extension or ≥50° flexion = 25% UEI
Extension		≥50° = 0%	30° to 40° = 1% UEI	10° extension to 10° flexion = 2% UEI	≥10° flexion/(10)	
Shoulder	30% Shoulder					
Abduction	Motion° = % Upper Extremity Impairment (% UEI)	≥170° = 0%	90° to 160° = 3% UEI	20° to 80° = 6% UEI	≤10° = 10% UEI	20° to 50°flexion = 9% UEI 10° flexion to extension or ≥60° flexion = 16% UEI
Adduction		≥40° = 0%	10° to 30° = 1% UEI	0° to 30° abduction = 2% UEI	≥40° abduction = 10% UEI	
Shoulder	20% Shoulder					
Internal rotation (IR)	Motion° = % Upper Extremity Impairment (% UEI)	≥80° IR = 0%	50° IR to 70° IR = 2% UEI	10° ER to 40° IR = 4% UEI	≤20° ER = 8% UEI	20° to 50° IR = 6% UEI ≥60° IR or 10° IR to ER = 0% UEI
External Rotation (ER)		≥60° ER = 0%	50° ER to 30° IR = 2% UEI	50° IR to 40° IR = 4% UEI	≥60° IR = 9% % UEI	

Convert ROM to Grade Modifier for Use in Diagnosis Based Rating

TABLE 15-35

Range of Motion Grade Modifiers

P 477

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Digit	Normal	<20% total digit impairment	20% to 39% digit impairment	40% to 70% digit impairment	>70% digit impairment.
Hand, wrist, elbow, or shoulder		<12% upper extremity impairment for *total* motion impairment	12% to 23% upper extremity impairment for *total* motion impairment	24% to 42% upper extremity impairment for *total* motion impairment	>42% upper extremity impairment for *total* motion impairment

TABLE 15-8

Physical Examination Adjustment: Upper Extremities

P 408

	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
	opposite side				
Range of Motion (reference Section 15.7)	None	Mild decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment <20% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of <12% upper extremity impairment.	Moderate decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment of 20% to 39% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of 12% to 23% upper extremity impairment.	Severe decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment of 40% to 70% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment of 24% to 42% upper extremity impairment.	Very severe decrease from normal or uninjured opposite side For digit impairments only, this reflects a total digit impairment >70% digit impairment. For wrist, elbow, and shoulder this reflects a total joint impairment >42% upper extremity impairment.

“Fudge” or Adjustment for UNUSUAL Case (p 473)

1. Only ROM method used
2. Reliable ROM measurements
3. Impairment does NOT adequately reflect
4. FH (symptoms) judged reliable

TABLE 15-36

Functional History Grade Adjustment: Range of Motion

P 477

Net Modifier	0	1	2	3
Functional History grade adjustment compared to range of motion ICF Class	Equal	1 Higher	2 Higher	3 Higher
Increase to total range of motion impairment	No change	Total Range of Motion Impairment × 5%	Total Range of Motion Impairment × 10%	Total Range of Motion Impairment × 15%
ICF indicates International Classification of Functioning, Disability, and Health.				

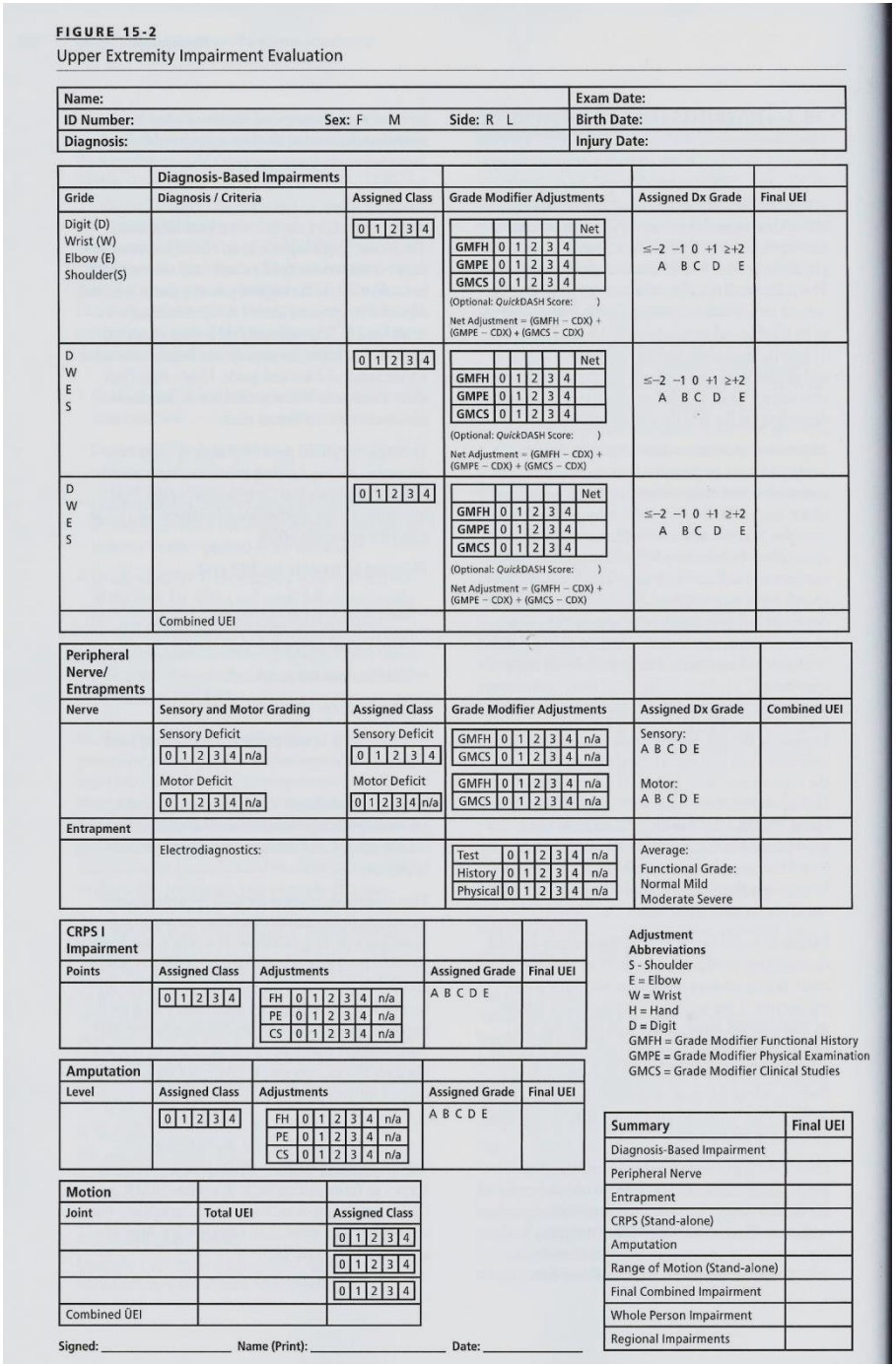


FIGURE 15-2
Upper Extremity Impairment Evaluation

Name:		Exam Date:
ID Number:	Sex: F M Side: R L	Birth Date:
Diagnosis:		Injury Date:

	Diagnosis-Based Impairments				
Gride	Diagnosis / Criteria	Assigned Class	Grade Modifier Adjustments	Assigned Dx Grade	Final UEI
Digit (D) Wrist (W) Elbow (E) Shoulder(S)		0 1 2 3 4	Net GMFH 0 1 2 3 4 GMPE 0 1 2 3 4 GMCS 0 1 2 3 4 (Optional: *Quick*DASH Score:) Net Adjustment = (GMFH − CDX) + (GMPE − CDX) + (GMCS − CDX)	≤−2 −1 0 +1 ≥+2 A B C D E	
D W E S		0 1 2 3 4	Net GMFH 0 1 2 3 4 GMPE 0 1 2 3 4 GMCS 0 1 2 3 4 (Optional: *Quick*DASH Score:) Net Adjustment = (GMFH − CDX) + (GMPE − CDX) + (GMCS − CDX)	≤−2 −1 0 +1 ≥+2 A B C D E	
D W E S		0 1 2 3 4	Net GMFH 0 1 2 3 4 GMPE 0 1 2 3 4 GMCS 0 1 2 3 4 (Optional: *Quick*DASH Score:) Net Adjustment = (GMFH − CDX) + (GMPE − CDX) + (GMCS − CDX)	≤−2 −1 0 +1 ≥+2 A B C D E	
	Combined UEI				

Peripheral Nerve/ Entrapments					
Nerve	Sensory and Motor Grading	Assigned Class	Grade Modifier Adjustments	Assigned Dx Grade	Combined UEI
	Sensory Deficit 0 1 2 3 4 n/a Motor Deficit 0 1 2 3 4 n/a	Sensory Deficit 0 1 2 3 4 Motor Deficit 0 1 2 3 4 n/a	GMFH 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a GMFH 0 1 2 3 4 n/a GMCS 0 1 2 3 4 n/a	Sensory: A B C D E Motor: A B C D E	
Entrapment					
	Electrodiagnostics:		Test 0 1 2 3 4 n/a History 0 1 2 3 4 n/a Physical 0 1 2 3 4 n/a	Average: Functional Grade: Normal Mild Moderate Severe	

CRPS I Impairment				
Points	Assigned Class	Adjustments	Assigned Grade	Final UEI
	0 1 2 3 4	FH 0 1 2 3 4 n/a PE 0 1 2 3 4 n/a CS 0 1 2 3 4 n/a	A B C D E	

Amputation				
Level	Assigned Class	Adjustments	Assigned Grade	Final UEI
	0 1 2 3 4	FH 0 1 2 3 4 n/a PE 0 1 2 3 4 n/a CS 0 1 2 3 4 n/a	A B C D E	

Motion		
Joint	Total UEI	Assigned Class
		0 1 2 3 4
		0 1 2 3 4
		0 1 2 3 4
Combined UEI		

Adjustment Abbreviations
S - Shoulder
E = Elbow
W = Wrist
H = Hand
D = Digit
GMFH = Grade Modifier Functional History
GMPE = Grade Modifier Physical Examination
GMCS = Grade Modifier Clinical Studies

Summary	Final UEI
Diagnosis-Based Impairment	
Peripheral Nerve	
Entrapment	
CRPS (Stand-alone)	
Amputation	
Range of Motion (Stand-alone)	
Final Combined Impairment	
Whole Person Impairment	
Regional Impairments	

Signed: _____ Name (Print): _____ Date: _____

P 481

- Useful for very complex cases
- NOT needed for simpler cases

Your friendship is

a precious treasure...