

Upper Extremity MMI and Impairment Rating

Video Disclaimer

The videos presented in this training are made available by the Texas Department of Insurance/Division of Workers' Compensation (TDI-DWC) for educational purposes only. The videos are not intended to represent the sole method or procedure appropriate for the medical situation discussed.

Material Disclaimer

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Combined Values for Impairment Rating

Each organ system/body area should be expressed as a whole person impairment, then

- Whole person impairments should be **combined** using the Combined Values Chart (pp. 322 – 324)
- “Combining” assures that the impairment can’t exceed 100%. It reduces the remaining portion of the whole person that is available for the second impairment

Example: 60% C/W 60% = 84%

60% IR leaves 40% of the person remaining

60% of 40 = 24% 60 + 24 = 84% (not 120)

Combining 3 or More Impairment Values

- “If three or more impairment values are to be combined, select any two and find their combined value as above. Then use that value and the third value to locate the combined value of all. This process can be repeated indefinitely, the final value in each instance being the combination of all the previous values. In each step of this process, the larger impairment value must be identified at the **side** of the chart.” (page 322)

Combining 3 or More Impairment Values

- **Best practice - combine the largest % with the second largest %, then combine with third largest %, etc.**

Conflict between DWC Statutes/Rules and AMA *Guides*

**DWC Statutes/Rules
take precedence**

Combining values in the Upper Extremity

1. Combine joint to joint (exception: thumb joint to joint ratings are added)
2. Combine final joint ROM with nerve or other disorders at digit
3. Combine final joint ROM and nerve or other disorder for final upper extremity impairment
4. If rating both upper extremities, take each to whole person IR value, THEN combine



Case 1 - Upper Extremity MMI/IR

History of Injury

- 25-year-old male working as painter lifted five gallon bucket partially full of paint
- Heard pop and experienced immediate right shoulder pain

Case 1 - Upper Extremity MMI/IR

Treatment History

- Saw PCP date of injury and diagnosed with shoulder strain
- Treated with ibuprofen and PT
- Initial 6 visits of PT over 3 weeks
 - Codman's and other passive ROM
 - Scapular stabilization/control exercises
 - Rotator cuff resistance exercises with minimal shoulder abduction

Case 1 - Upper Extremity MMI/IR

Treatment History (cont'd)

- PCP follow-up **3 weeks post injury**
 - “Not better”
 - Restricted painful shoulder ROM
 - Shoulder flexion and abduction approximately 80°, IR/extension thumb to L5
 - RTW with restrictions – restricted duty work unavailable
- Orthopedic surgeon referral



Case 1 - Upper Extremity MMI/IR

Treatment History (cont'd)

- Orthopedic surgeon **5 weeks post injury**
 - Active shoulder abduction and flexion approximately 90 degrees
 - Inability to actively resist abduction (4/5)
 - Positive impingement signs
 - X-rays negative for fracture, dislocation, but Type III acromion
 - Ordered shoulder MR arthrogram right shoulder

Case 1 - Upper Extremity MMI/IR

Treatment History (cont'd)

- MR arthrogram **6 weeks post injury**
 - Partial thickness rotator cuff (supraspinatus) tear
 - Type III acromion
 - Subacromial effusion

Case 1 - Upper Extremity MMI/IR

Treatment History (cont'd)

- Orthopedic surgeon **7 weeks post injury**
 - Symptoms, activity tolerance and PE unchanged
 - Restricted duty work unavailable
 - Inability to actively resist abduction (4/5)
 - Subacromial corticosteroid and concurrent PT



Case 1 - Upper Extremity MMI/IR

Treatment History (cont'd)

- **PT 8-11 weeks post injury**
 - 6 additional visits
 - Concurrent with 2 subacromial corticosteroid injections
 - Progression of scapular and rotator cuff strengthening
 - Shoulder flexion 120°, extension 30°, adduction 30°, abduction 100°, IR 20°, ER 30° at discharge (12th visit of PT)
 - Restricted duty work still unavailable



Case 1 - Upper Extremity MMI/IR

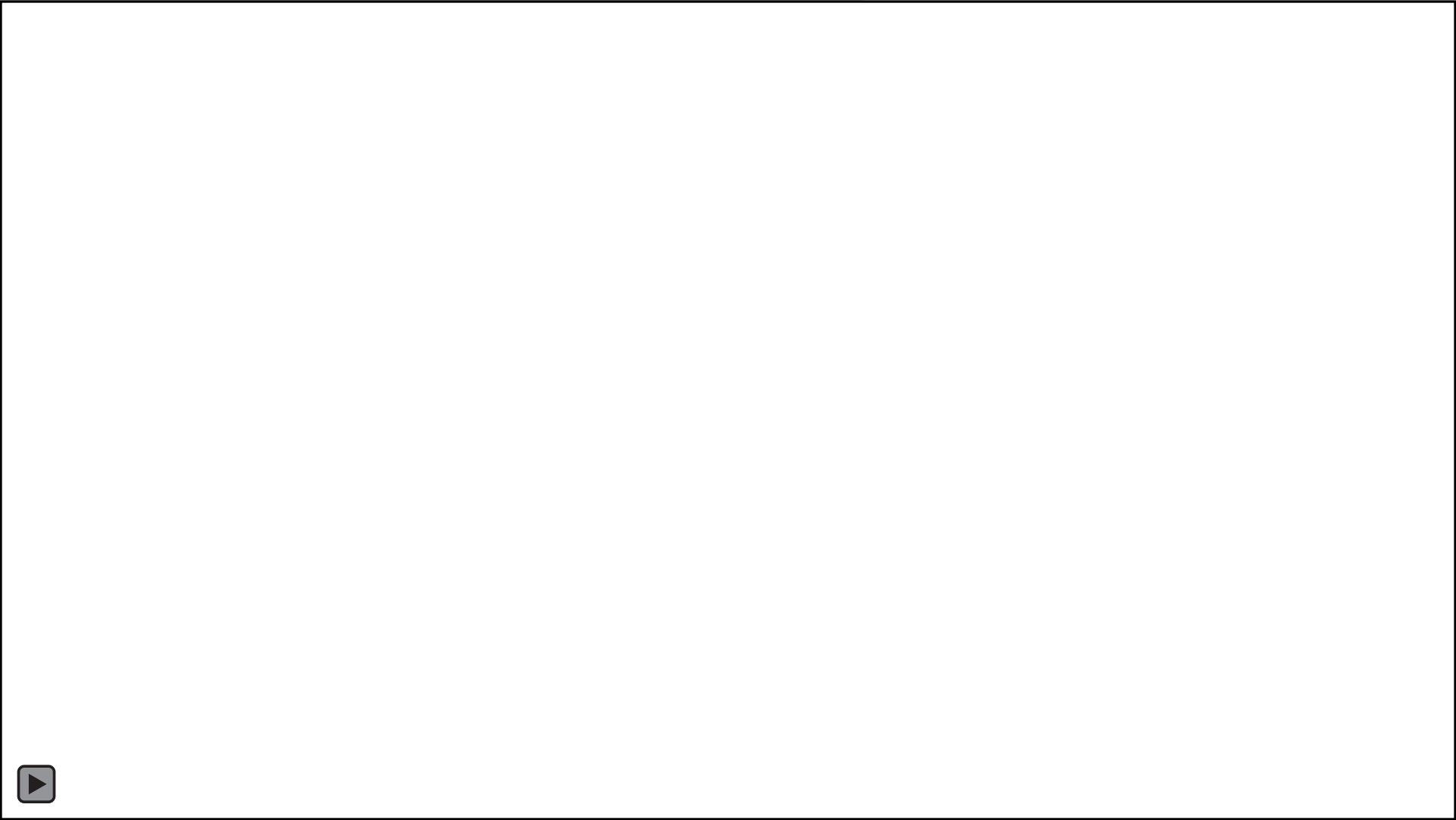
Treatment History (cont'd)

- Orthopedic surgeon **12 weeks post injury**
 - Symptoms, activity tolerance improved
 - Shoulder abduction and flexion approximately 120°
 - Mildly positive impingement signs
 - Restricted duty work unavailable
 - Recommended continued 6 visits of PT
 - PT preauthorization denied, appealed
 - Insurance carrier “accepts shoulder sprain, denies partial thickness rotator cuff tear”

Case 1 - Upper Extremity MMI/IR

DD Exam - 20 Weeks Post Injury

- Medical History
 - States cannot use right arm well at all, especially above shoulder level
 - Right arm “really weak”
 - Right shoulder “stiff”
 - PT and injections helped, but no PT in about 8 weeks
 - Doing some exercises at home
 - Wants to work “but my boss won’t let me”



Case 1 - Upper Extremity MMI/IR

DD Physical Exam - 20 Weeks Post Injury

- Shoulder flexion 110°, extension 30°, abduction 90°, adduction 20°, ER 20°, IR 10°
- 4/5 strength right shoulder abduction, flexion and external rotation when performed at > 45°- 60° of abduction or flexion
- UE DTRs and sensation normal

Case 1 - Upper Extremity MMI/IR

Based on medical records and physical exam, what is compensable injury for certifying MMI and IR?



Case 1 - Upper Extremity MMI/IR

What is compensable injury for certifying MMI and IR?

- A. Right shoulder strain
- B. Partial thickness right rotator cuff (supraspinatus) tear complicated by pre-existing Type III acromion
- C. A and B
- D. None of above



Case 1 - Upper Extremity MMI/IR

Question for DD to
consider in the exam:

Has MMI been reached?
If so, on what date?

*(May not be greater than
statutory MMI date shown on
DWC Form-032)*

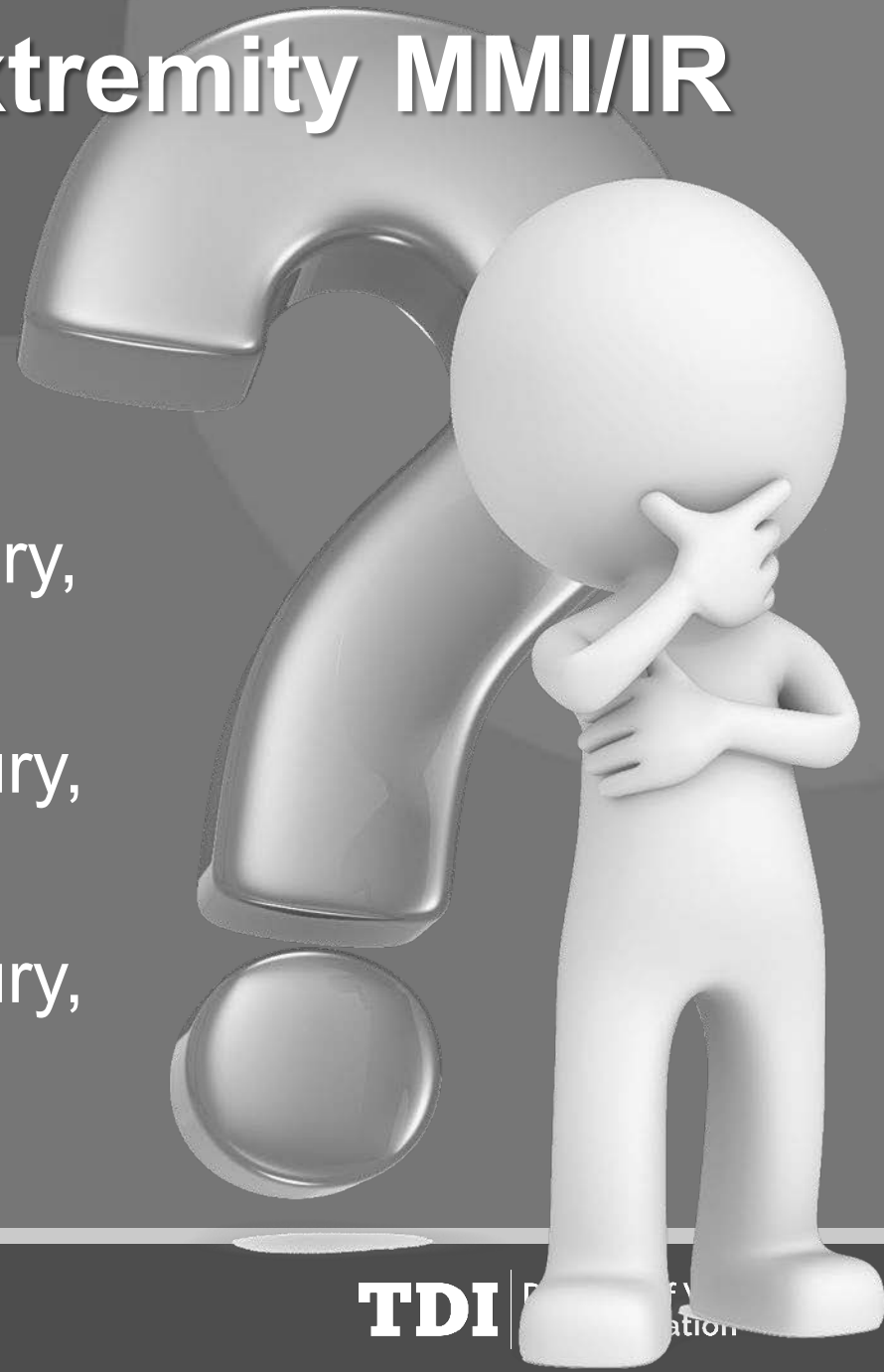


Case 1 - Upper Extremity MMI/IR

Has MMI been reached?

If so, on what date?

- A. Yes, 11 weeks post injury,
date of 12th PT visit
- B. Yes, 12 weeks post injury,
date of ortho follow-up
- C. Yes, 20 weeks post injury,
date of DD exam
- D. No, not at MMI



Case 1 - Upper Extremity MMI/IR

- Additional PT?
 - ODG recommendations, including Appendix D
 - Pre-authorization denial
- Surgery?
- Other?

Questions About Case 1 – UE MMI/IR?



Case 1 - Upper Extremity MMI/IR

The Sequel

DD Exam - 52 Weeks Post Injury

- Medical History
 - Arthroscopic rotator cuff repair with acromioplasty at 22 weeks post injury
 - Completed 24 visits weeks 34-48 post injury following post-op immobilization
 - RTW full time at new job 50 weeks post op with 50# lifting restriction no lifting > 25# above shoulder height



Case 1 - Upper Extremity MMI/IR

The Sequel

DD Exam - 52 Weeks Post Injury

- Medical History (cont'd)
 - PT discharge **48 weeks post injury**
 - 5/5 UE strength
 - Progression of resisted rotator cuff/scapular strengthening exercises
 - Shoulder ROM
 - flexion 170°,
 - abduction 160°
 - adduction/IR thumb to T10

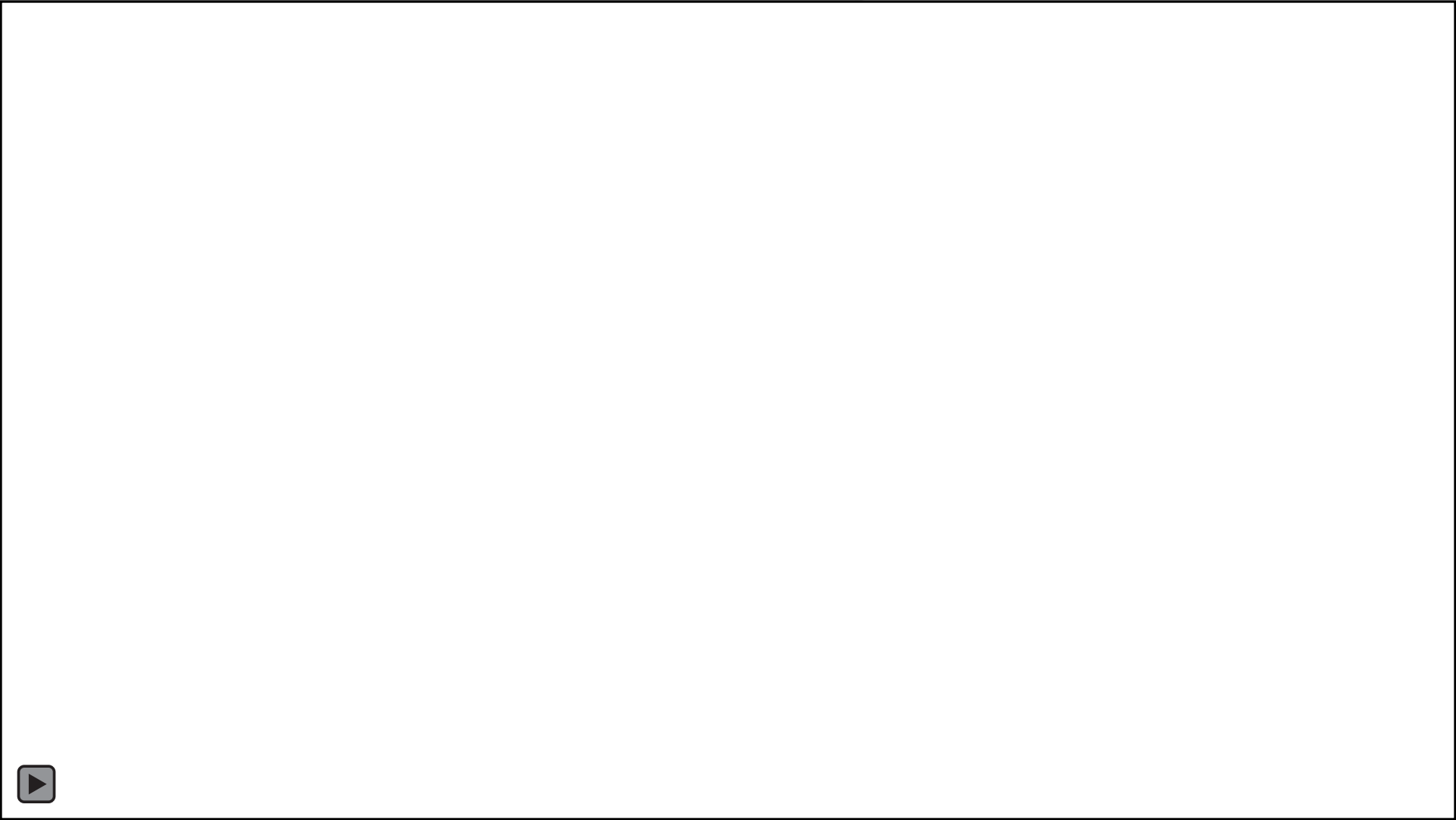


Case 1 - Upper Extremity MMI/IR

The Sequel

DD Exam - 52 Weeks Post Injury

- Medical History (cont'd)
 - Ortho follow up **49 weeks post injury**
 - “Much better, finished with PT, doing home exercises”
 - “Full ROM and strength”
 - Follow up prn



Case 1 - Upper Extremity MMI/IR

The Sequel

DD Physical Exam - 52 Weeks Post Injury

- Shoulder ROM
- Flexion 170°
- Extension 40°
- Abduction 160°
- Adduction 40°
- IR 60°
- ER 60°

Case 1 - Upper Extremity MMI/IR

The Sequel

DD Physical Exam - 52 Weeks Post Injury

- Constant AC joint crepitation with active right shoulder range of motion
- 5/5 strength right shoulder with manual muscle testing
- Normal UE DTRs and sensation

Case 1 - Upper Extremity MMI/IR

The Sequel

Based on medical records and physical exam, what is compensable injury for certifying MMI and IR?



Case 1 - Upper Extremity MMI/IR

The Sequel

Question for DD to
consider in the exam:

Has MMI been reached?
If so, on what date?

*(May not be greater than
statutory MMI date shown on
DWC Form-032)*



Case 1 - Upper Extremity MMI/IR

The Sequel

Has MMI been reached?

If so, on what date?

- A. Yes, 48 weeks post injury, date of PT discharge
- B. Yes, 49 weeks post injury, date of ortho follow-up
- C. Yes, 50 weeks post injury, date began working with restrictions at new job
- D. Yes, 52 weeks post injury, date of DD exam
- E. No, not at MMI



Upper Extremity Case 1 MMI/IR

The Sequel

Question for DD to
consider in the exam:

On MMI date what is
whole person IR?

Show your work!



Case 1 - Upper Extremity MMI/IR

The Sequel

On date of MMI, what is whole person IR?

- A. 3%
- B. 5%
- C. 9%
- D. 15%



Impairment Rating

- Shoulder ROM from DD exam for condition at MMI prior to DD exam
- Clinical condition is the same
- ***Explain in your report!***

Case 1 - Upper Extremity MMI/IR

The Sequel

DD Physical Exam - 52 Weeks Post Injury

- Shoulder ROM
- Flexion 170°
- Extension 40°
- Abduction 160°
- Adduction 40°
- IR 60°
- ER 60°

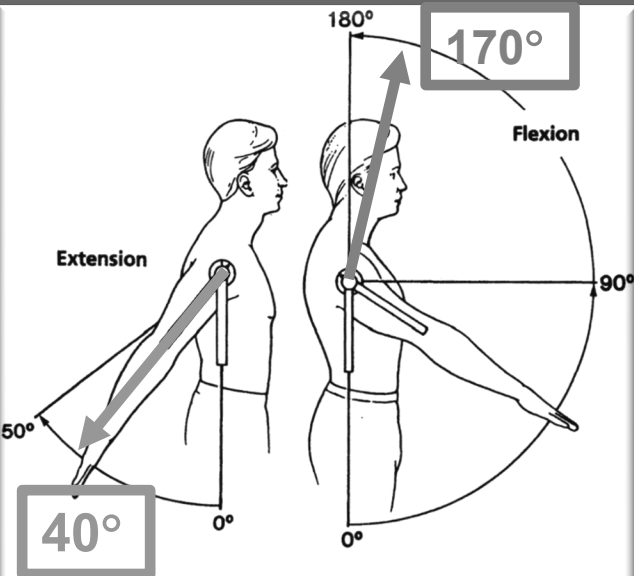


Fig. 36, p. 42
Shoulder Extension and Flexion

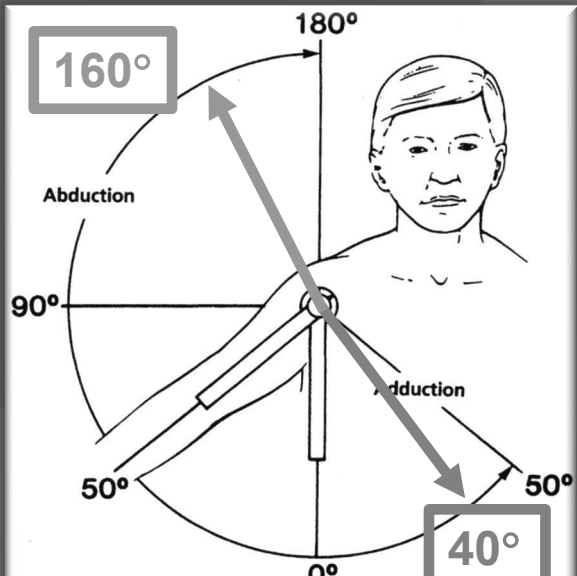


Fig. 39, p. 43 Shoulder Abduction and Adduction

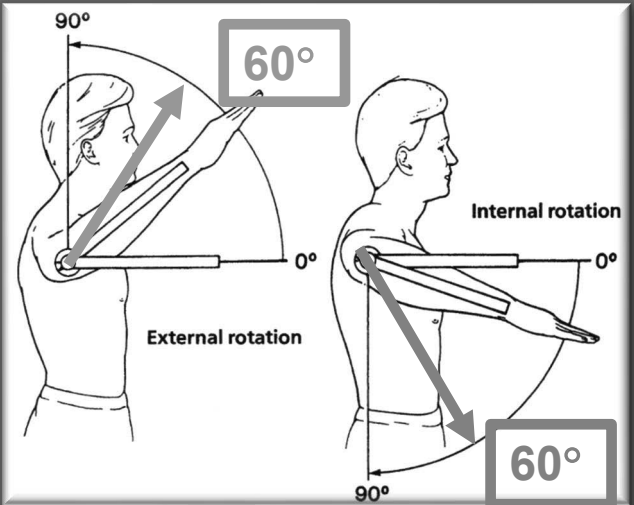


Fig. 42, p. 44 - Shoulder External & Internal Rotation

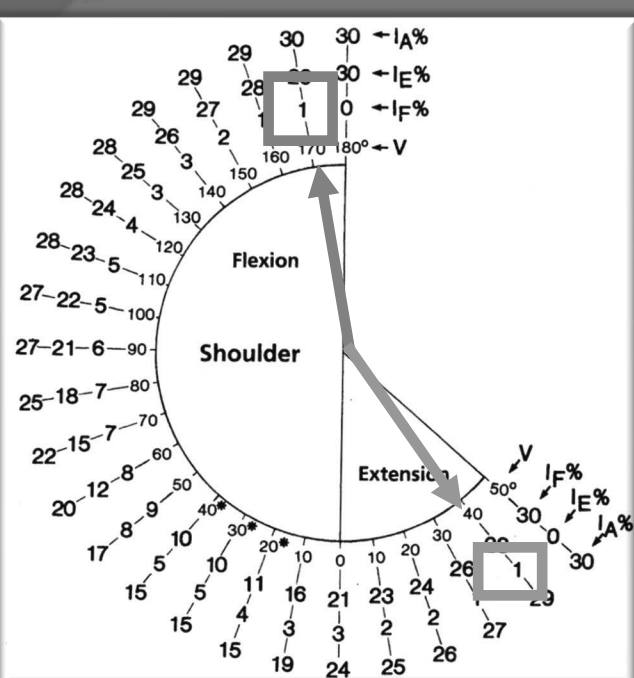


Fig. 38, p. 43

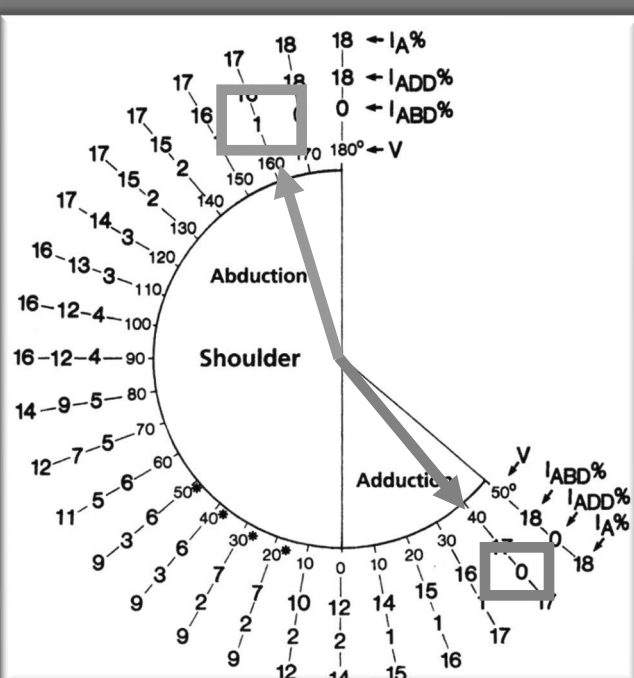


Fig. 41, p. 44

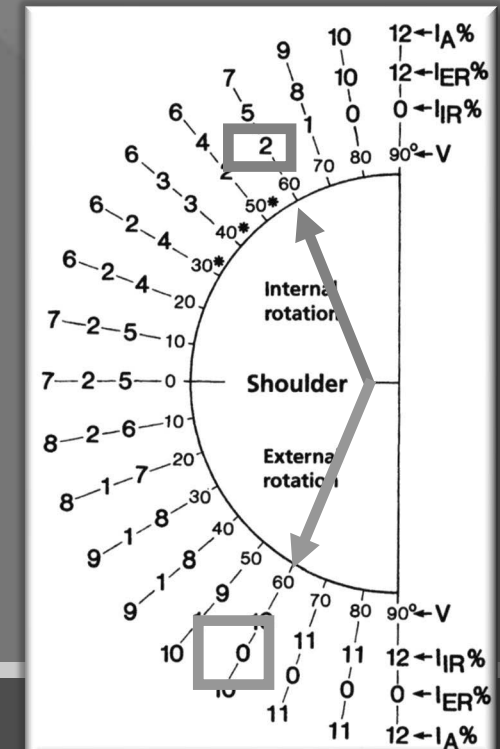


Fig. 44, p. 45

Shoulder

	Flexion	Extension	Ankylosis	IMP%
Angle°	170°	40°		2%
IMP%	1%	1%		
	Add	Abd	Ankylosis	IMP%
Angle°	40°	160°		1%
IMP%	0%	1%		
	Int Rot	Ext Rot	Ankylosis	IMP%
Angle°	60°	60°		2%
IMP%	2%	0%		

Add IMP% F/E + Add/Abd + IR/ER =

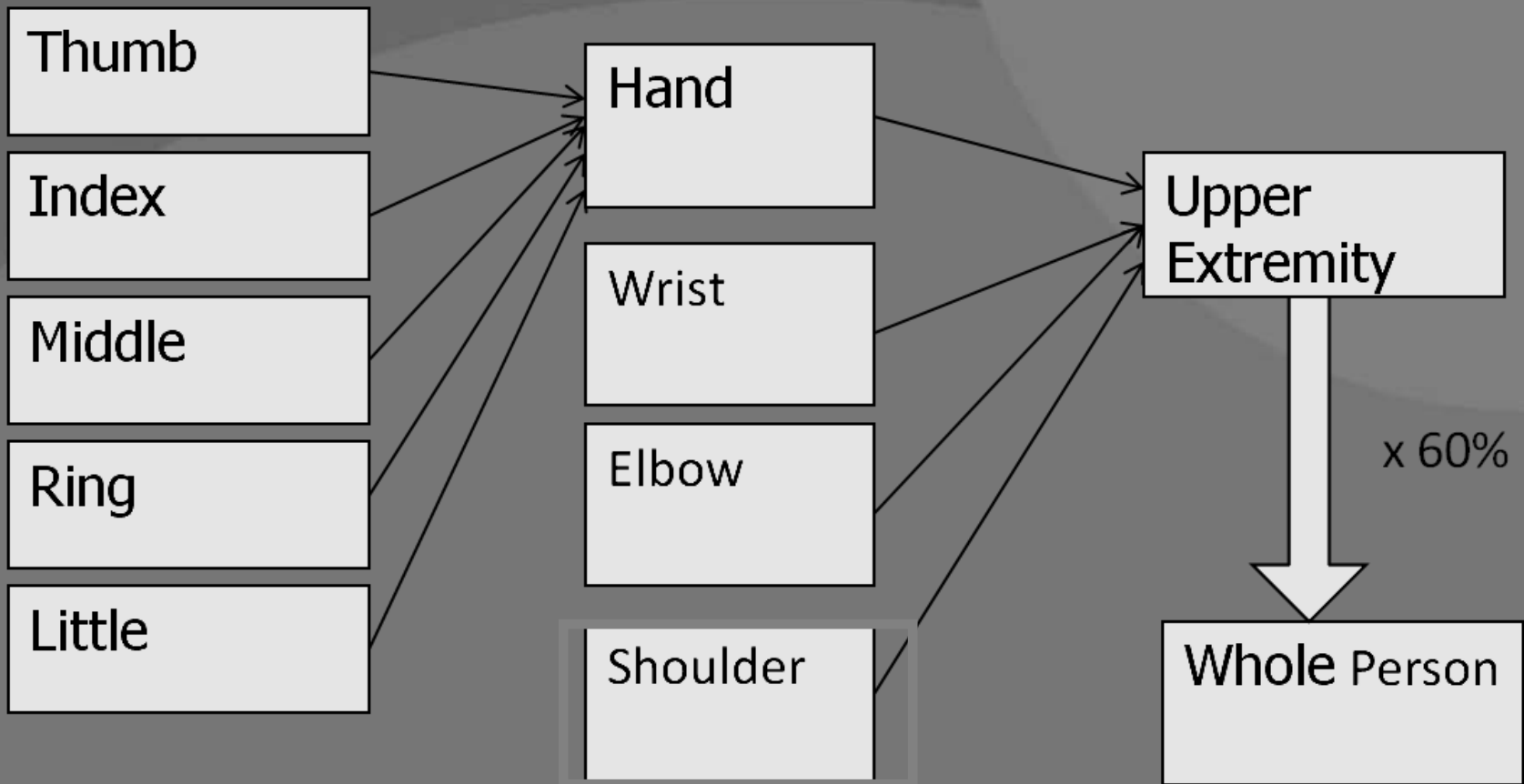
5% UE

[1]

IMP% :

Whole Person Concept

Upper Extremity



Convert Upper Extremity to Whole Person *Table 3, Page 20*

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

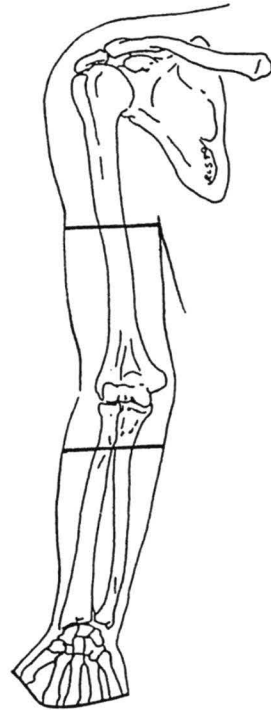
5% UE = 3% Whole Person

Figure 1. Upper Extremity Impairment Evaluation Record—Part 2 (Wrist, elbow, and shoulder)

Side ☒ R ☐ L

Name Edward Munch Age 25 Sex ☒ M ☐ F Dominant hand ☐ R ☐ L Date mm/dd/yy

Occupation painter Diagnosis right rotator cuff tear

Abnormal motion					Other disorders	Regional impairment %	Amputation	
Record motion, ankylosis and impairment %					List type & impairment %	• Combine [1] + [2]	Mark level & impairment %	
Wrist	Flexion	Extension	Ankylosis	IMP%				
	Angle°							
	IMP%							
	RD	UD	Ankylosis	IMP%				
	Angle°							
	IMP%							
	Add IMP% F/E + RD/UD = [1]							IMP% = [2]
Elbow	Flexion	Extension	Ankylosis	IMP%				
	Angle°							
	IMP%							
	Pro	Sup	Ankylosis	IMP%				
	Angle°							
	IMP%							
	Add IMP% F/E + PRO/SUP = [1]							IMP% = [2]
Shoulder	Flexion	Extension	Ankylosis	IMP%				
	Angle°	<u>170</u>	<u>40</u>					<u>2</u>
	IMP%	<u>1</u>	<u>1</u>					
	Add	Abd	Ankylosis	IMP%				
	Angle°	<u>40</u>	<u>160</u>					<u>1</u>
	IMP%	<u>0</u>	<u>1</u>					
	Int Rot	Ext Rot	Ankylosis	IMP%				
	Angle°	<u>60</u>	<u>60</u>					<u>2</u>
	IMP%	<u>2</u>	<u>0</u>					
	Add IMP% F/E + Add/Abd + IR/ER = <u>5%</u> [1]							IMP% = [2]

II. Regional impairment of upper extremity

• (Combine hand _____% + wrist _____% + elbow _____% + shoulder 5%) = 5%

Total upper extremity impairment (• Combine I + II + III + IV + V) 5% = 5%

Impairment of the whole person (Use Table 3 p. 20) = 3%



Case 1 - Upper Extremity MMI/IR

The Sequel

- What about acromioplasty and Table 27 on page 61?
- By definition, requires resection of distal clavicular portion of AC joint (not same as acromioplasty)
- Carefully review and cite relevant portions of operative report

Case 1 - Upper Extremity MMI/IR

The Sequel

What if he had undergone resection
arthroplasty of distal clavicle for this injury?

Upper Extremity Other Disorders

“It is emphasized that impairments from the disorders considered in the section are usually estimated by using other criteria. The criteria described in this section should be used only when the other criteria have not adequately encompassed the extent of the impairments.” Section 3.1m, page 58 AMA Guides, 4th Edition

APD 151158-s

“The language contained on page 3/58 is ambiguous, whereas the language on page 3/62 provides more clear instruction regarding the rating of arthroplasty procedures. Therefore, we hold that impairment for a distal clavicle resection arthroplasty that was received as treatment for the compensable injury results in 10% UE impairment under Table 27, which is then combined with ROM impairment, if any, as provided by the AMA Guides.”

What About Crepitation?

Text Above Table 18, Page 58

The evaluator must take care to avoid duplication of impairments when other findings, such as synovial hypertrophy, carpal collapse with arthritic changes, or limited motion, are present. Those findings might indicate a greater severity of the same pathologic process and take precedence over evaluation of joint crepitation, which should not be rated in that instance.

Questions About Case 1 - UE MMI/IR *The Sequel ?*



Case 2 - Upper Extremity MMI/IR

History of Injury

- 25 year-old male oil field worker sustained a crush injury to left hand

Case 2 - Upper Extremity MMI/IR

Treatment History

- Seen in ER date of injury and underwent surgery date of injury
- Traumatic amputation of left index finger at metacarpal phalangeal joint
- Fractures of proximal phalanx of left thumb and proximal phalanx of middle finger treated with pin fixation

Case 2 - Upper Extremity MMI/IR

Treatment History (cont'd)

- 24 post op OT visits
- OT discharge **40 weeks post injury**
 - Well healed index finger amputation
 - Thumb ROM
 - IP flexion 60° and extension +10°
 - MP flexion 50° and extension 0°
 - Abduction 70°
 - Adduction and opposition “essentially full”



Case 2 - Upper Extremity MMI/IR

Treatment History (cont'd)

- OT discharge **40 weeks post injury**
 - Middle finger ROM
 - DIP flexion 50° and extension -10°
 - PIP flexion 60° and extension -10°
 - MP flexion 70° and extension 0°
 - Sensation decreased over the palmar surface of the entire middle finger



Case 2 - Upper Extremity MMI/IR

Treatment History (cont'd)

- Treating doctor follow-up **40 weeks post injury**
 - Healed thumb and finger fractures and index finger wound site
 - More time needed for spontaneous healing of digital nerve injury to middle finger

Case 2 - Upper Extremity MMI/IR

Treatment History (cont'd)

- Treating doctor follow-up **52 weeks post injury**
 - Healed middle finger and thumb fractures and index finger wound site
 - Numbness of the middle finger unchanged over the last 3 months
 - Thumb and middle finger ROM “same as prior visit after completing OT”
 - Returned to work at new job
 - Continue gabapentin, follow-up 3 months

Case 2 - Upper Extremity MMI/IR

DD Physical Exam 60 Weeks Post-Injury

- Taking gabapentin
- Working full time at new job
- Continued numbness middle finger
- Well healed scars, no redness/swelling



Case 2 - Upper Extremity MMI/IR

DD Physical Exam 60 Weeks Post-Injury (cont'd)

- Left thumb
 - IP flexion 70°, extension 10°
 - MP flexion 50°, MP extension 0°
 - Abduction 70°
 - Lack of adduction = 1cm
 - Able to oppose to 7cm from the palm
 - 6 mm 2 point discrimination entire palmar aspect

Case 2 - Upper Extremity MMI/IR

DD Physical Exam 60 Weeks Post-Injury (cont'd)

- Amputation left index finger at MP joint
- Middle finger ROM
 - DIP flexion 50° and extension -10°
 - PIP flexion 60° and extension -10°
 - MP flexion 70° and extension 0°
- Middle finger sensation >15 mm 2 point discrimination entire palmar aspect of entire finger from MP joint distally

Case 2 - Upper Extremity MMI/IR

Based on medical records and physical exam, what is compensable injury for certifying MMI and IR?



Case 2 - Upper Extremity MMI/IR

Has MMI been reached?

If so, on what date?

- A. Yes, 40 weeks post injury, date of OT discharge and treating doctor follow-up
- B. Yes, 52 weeks post injury, date of treating doctor follow-up
- C. Yes, 60 weeks post injury, date of DD exam
- D. No, not at MMI



Case 2 - Upper Extremity MMI/IR

Question for DD to consider in the exam:

On MMI date what is whole person IR?

Show your work!



Case 2 - Upper Extremity MMI/IR

On date of MMI what is whole person IR?

- A. 36%
- B. 32%
- C. 19%
- D. 17%



Case 2 - Upper Extremity MMI/IR

What are you rating?

- Thumb ROM
- Index finger amputation
- Middle finger
 - ROM
 - Sensory loss

Use Figure 1!

Thumb ROM

- IP flexion 60° , extension $+10^{\circ}$
- MP flexion 50° , MP extension 0°
- Abduction 70°
- Lack of adduction = 1 cm
- Able to oppose to 7 cm from palm

Figure 10, Page 26

IP flexion $60^\circ = 1\%$

IP extension $10^\circ = 0\%$

Add $1\% + 0\% = 1\%$

(IP thumb ROM
impairment)

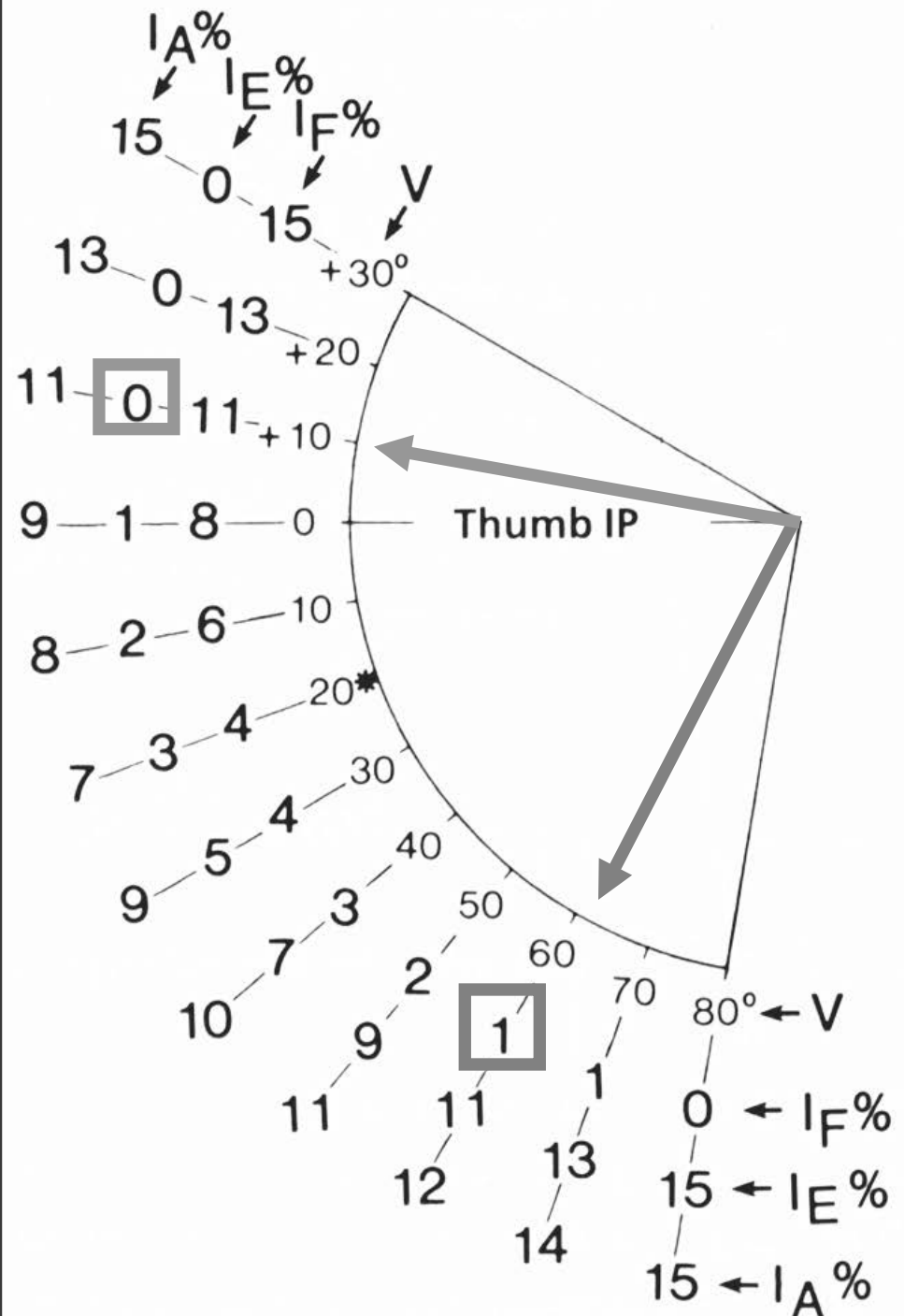


Figure 13, Page 27

MP flexion $50^{\circ} = 1\%$

MP extension $0^{\circ} = 0\%$

Add $0\% + 1\% = 1\%$

(MP thumb ROM
impairment)

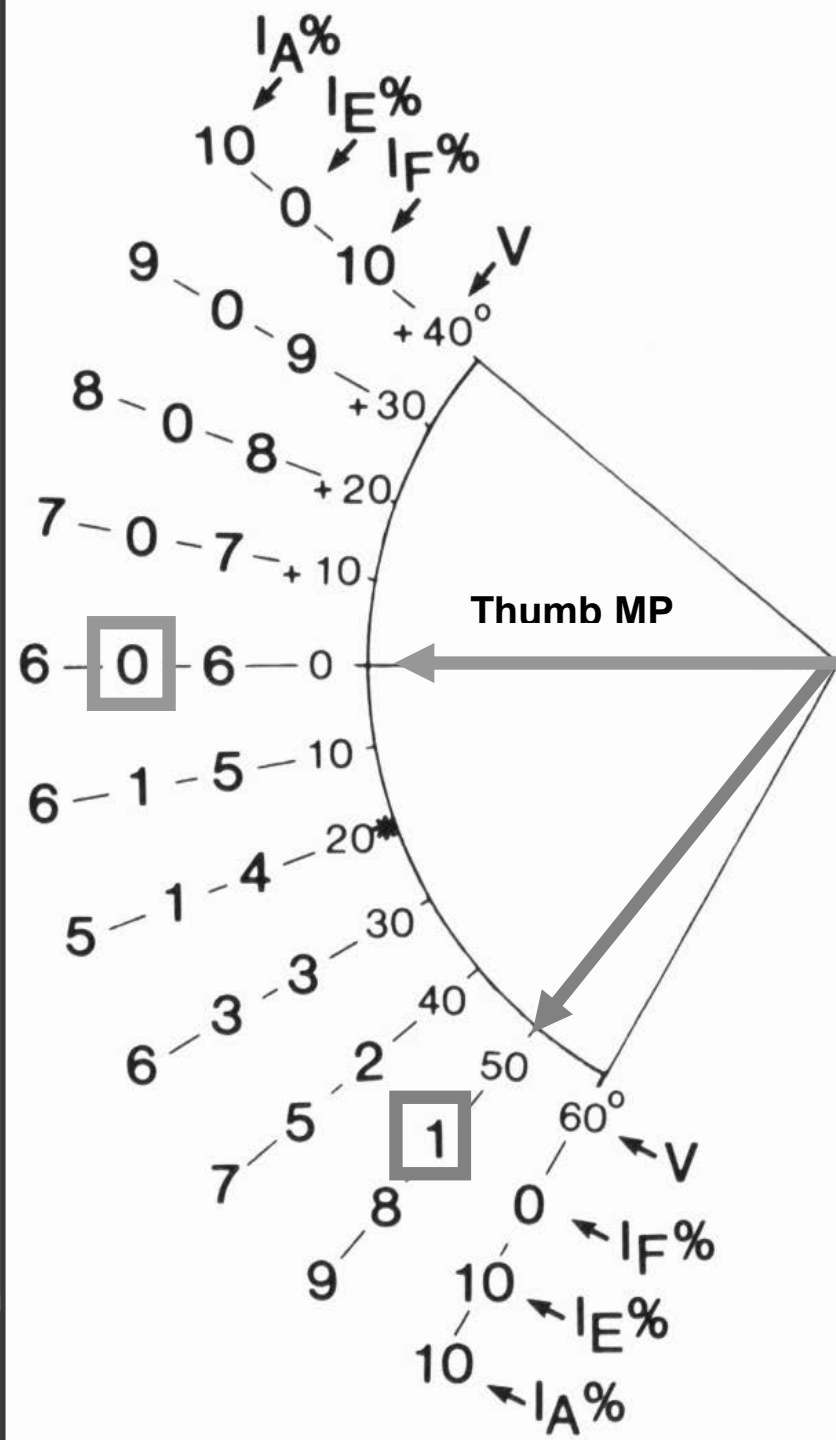
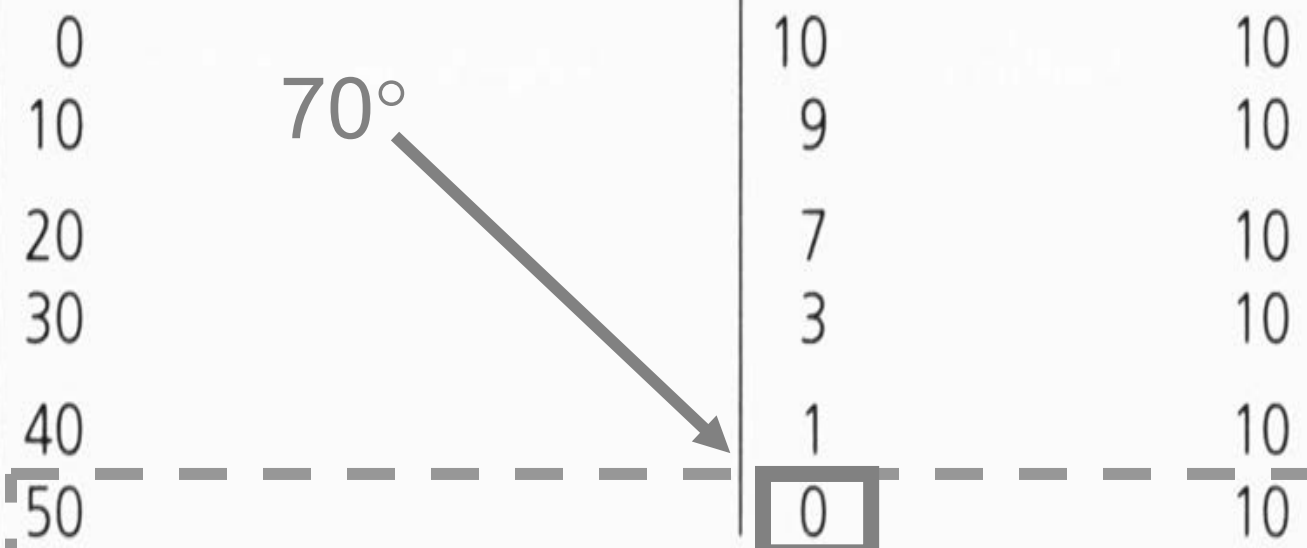


Table 6, Page 28

Abduction 70° = 0% thumb impairment

Measured radial abduction ($^{\circ}$)	% Thumb impairment due to	
	Abnormal motion	Ankylosis
0	10	10
10	9	10
20	7	10
30	3	10
40	1	10
50	0	10



70°

Figure 14, Page 28

Measure lack of adduction

Note: Lack of 8 cm of adduction = 100% impairment

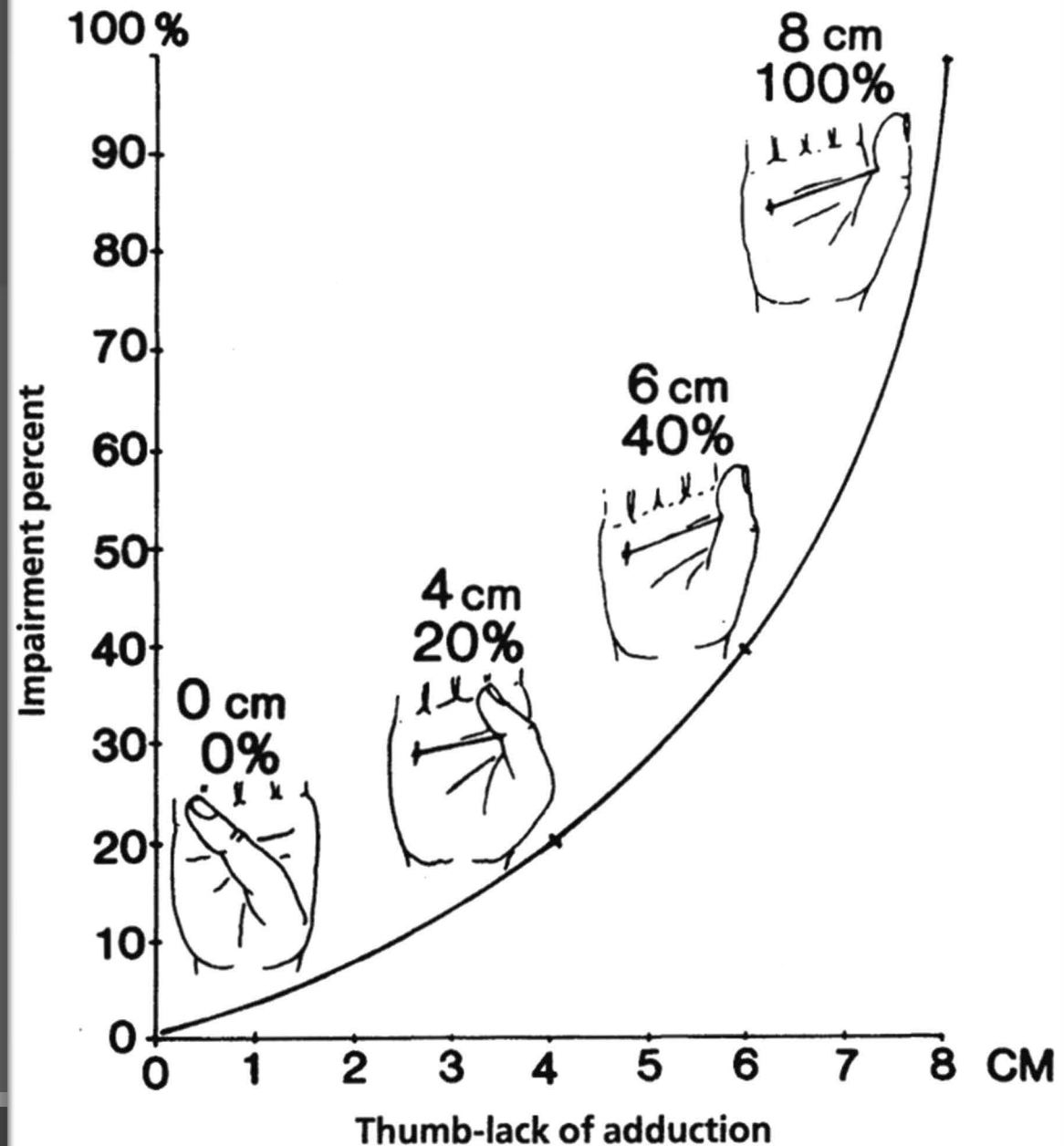


Table 5, Page 28

1 cm
measured
lack of
adduction
= 0%
thumb
impairment

Measured lack of adduction (cm)	% Thumb impairment due to	
	Abnormal motion	Ankylosis
8	20	20
7	13	19
6	8	17
5	6	15
4	4	10
3	3	15
2	1	17
1	0	19
0	0	20

Table 7, Page 29

7 cm
opposition
= 1%
thumb
impairment

Measured opposition (cm)	% Thumb impairment due to	
	Abnormal motion	Ankylosis
0	45	45
1	31	40
2	22	36
3	13	31
4	9	27
5	5	22
6	3	24
7	1	27
8	0	29

Abnormal Motion Thumb

- Five areas of motion
- Add impairment losses of *different* joints of thumb
- ***Use Figure 1!***



Thumb ROM Impairment

- IP flexion (70°) 1% +
IP extension ($+10^\circ$) 0% = 1%
- MP flexion (50°) 1% +
IP extension (0°) 0% = 1%
- Abduction 70° = 0%
- Adduction lacks 1 cm = 0%
- Opposition to 7 cm from palm = 1%
- Total:
 - 1% + 1% + 1% = **3% thumb impairment**

Convert Digit to Hand

Table 1, Page 18

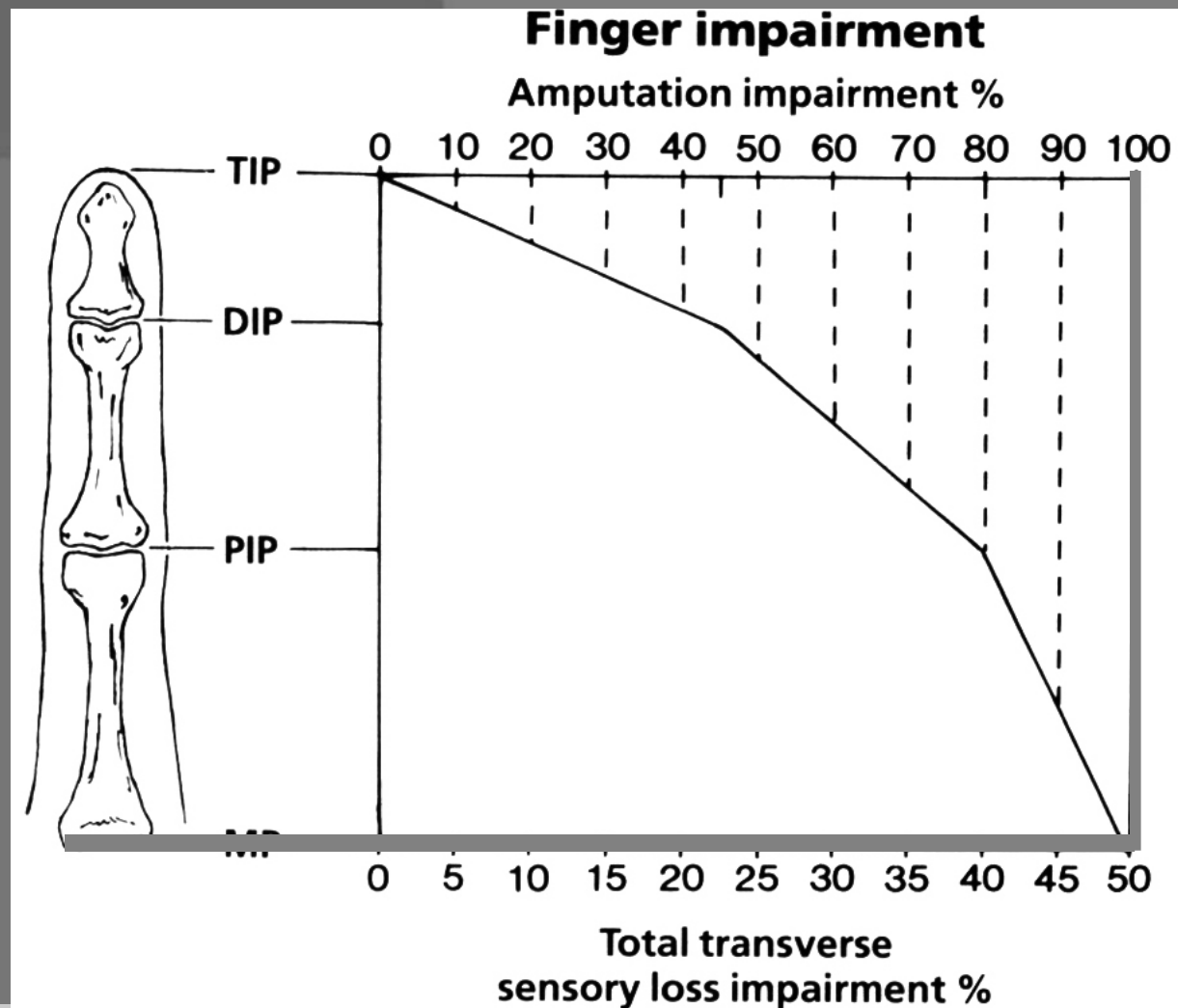


% Impairment of		% Impairment of		% Impairment of	
Thumb	Hand	Index or middle finger	Hand	Ring or little finger	Hand
0- 1 = 0		0- 2 = 0		0- 4 = 0	
2- 3 = 1		3- 7 = 1		5- 14 = 1	
4- 6 = 2		8- 12 = 2		15- 24 = 2	
7- 8 = 3		13- 17 = 3		25- 34 = 3	
9- 11 = 4		18- 22 = 4		35- 44 = 4	
12- 13 = 5		23- 27 = 5		45- 54 = 5	
14- 16 = 6		28- 32 = 6		55- 64 = 6	
17- 18 = 7		33- 37 = 7		65- 74 = 7	
19- 21 = 8		38- 42 = 8		75- 84 = 8	
22- 23 = 9		43- 47 = 9		85- 94 = 9	
24- 26 = 10		48- 52 = 10		95-100 = 10	
27- 28 = 11		53- 57 = 11			
37- 38 = 15		73- 77 = 15			
39- 41 = 16		78- 82 = 16			
42- 43 = 17		83- 87 = 17			
44- 46 = 18		88- 92 = 18			
47- 48 = 19		93- 97 = 19			
49- 51 = 20		98-100 = 20			
52- 53 = 21					
54- 56 = 22					
57- 58 = 23					
59- 61 = 24					
62- 63 = 25					
64- 66 = 26					

3% thumb impairment = 1% hand

Index Finger Amputation

- MP joint = 100% length of digit
- 100% index finger impairment



Convert Digit to Hand

Table 1, Page 18

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

**100% index finger impairment =
20% hand**

Middle Finger

- Middle finger ROM
 - DIP flexion 50° =
 - $10\% + \text{extension } -10^{\circ} = 2\% = 12\%$
 - PIP flexion 60° =
 - $24\% + \text{extension } -10^{\circ} = 3\% = 27\%$
 - MP flexion 70° =
 - $11\% + \text{extension } 0^{\circ} = 5\% = 16\%$
- **Combine** 27% cw $16\% = 39\%$
 - 39% cw $12\% = 46\%$ middle finger
- ROM = 46% middle finger
- ***USE FIGURE 1!***



DIP Flexion-Extension

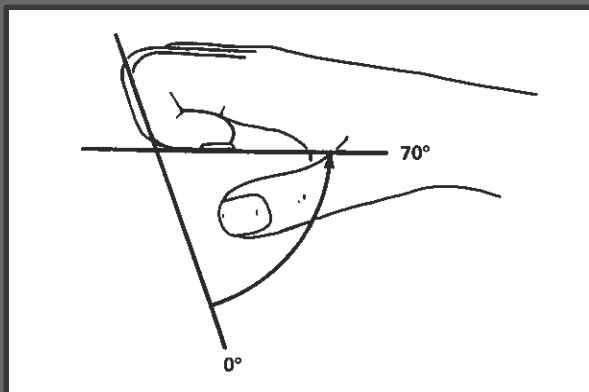


Figure 18, page 32

PIP Flexion-Extension

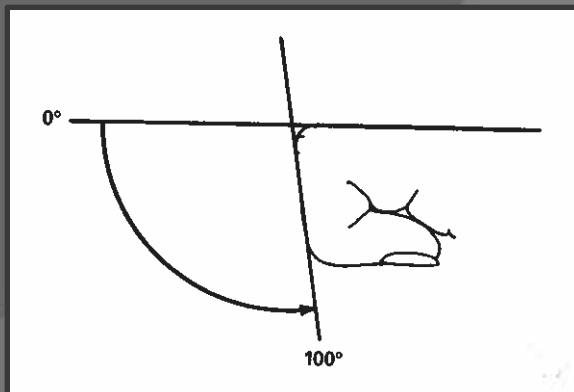


Figure 20, page 33

MP Flexion-Extension

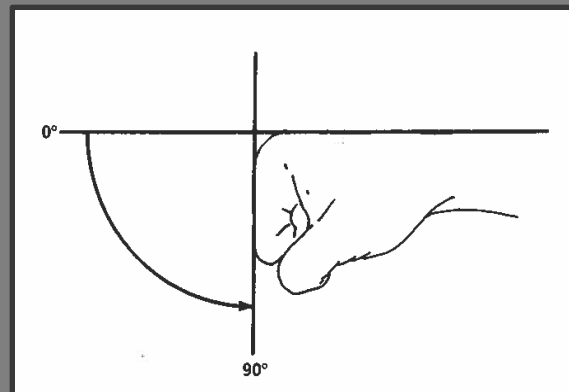


Figure 22, page 34

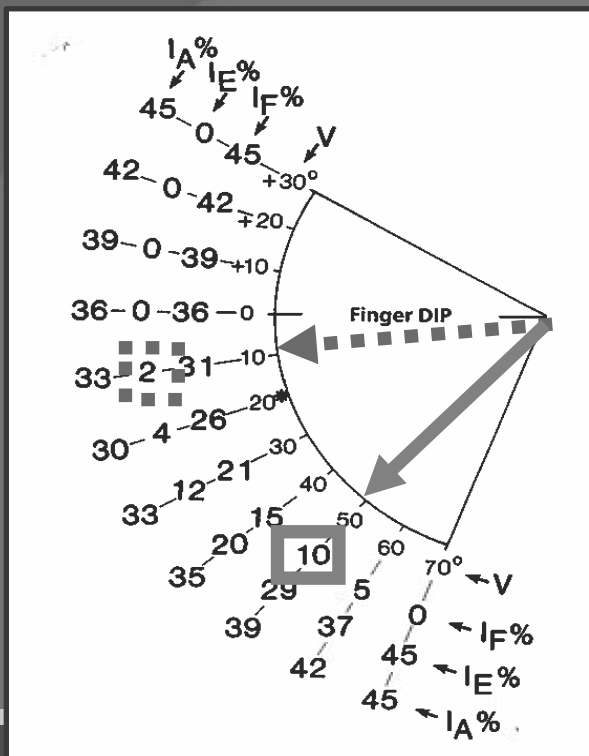


Figure 19, page 32

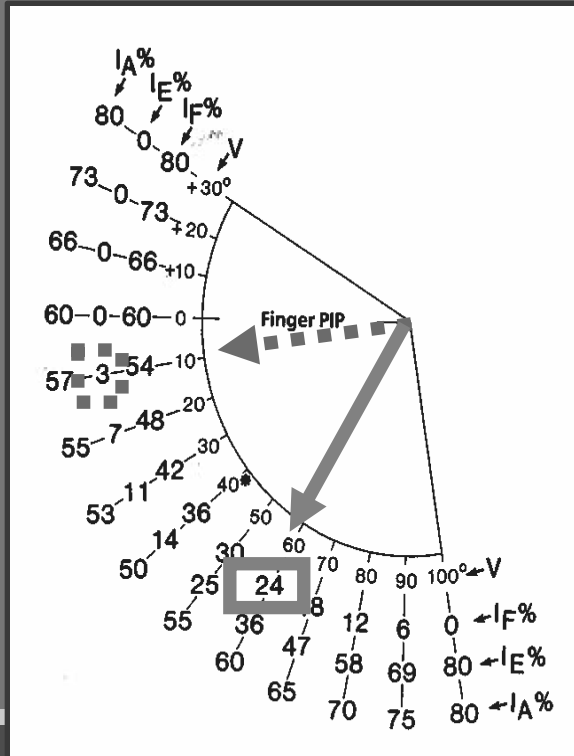


Figure 21, page 33

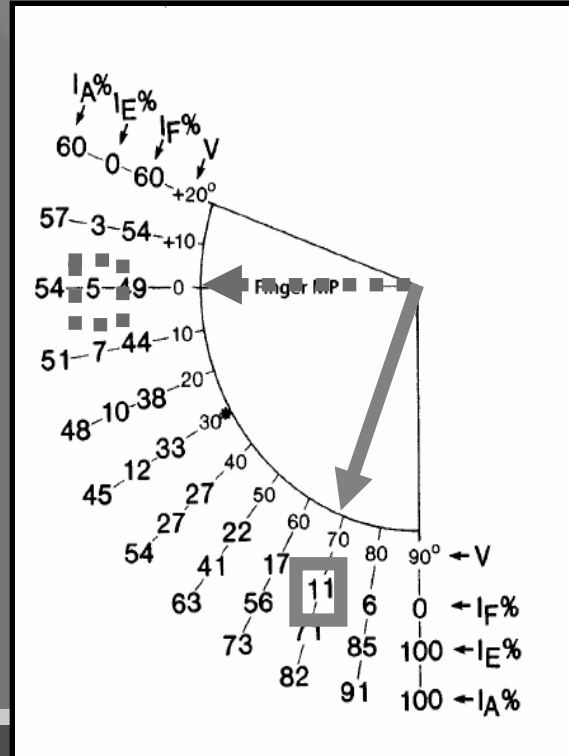


Figure 23, page 34

Middle Finger – Sensory Loss

- Middle finger sensation finger sensation >15 mm 2 point discrimination entire palmar aspect of the finger from MP joint distally
- Total transverse sensory loss of 100% digit length of the middle finger = 50% middle finger

Sensory Loss of Digits

Determine Quality of Loss, page 21

- Determine by two-point exam
- > 15 mm = ***total*** sensory loss, 100% sensory impairment
- 15 mm through 7 mm = ***partial*** sensory loss, 50% sensory impairment
- ≤ 6 mm ***normal***, 0% sensory impairment



Sensory Loss of Digits

Different Types

- Transverse Loss – this case
 - Loss of function in **both digital nerves (entire palmar distribution)**
 - 100% sensory loss and receive 50% value of amputation at that level
 - Fingers - Figure 17, page 30 (this case)
 - Thumb - Figure 7, page 24

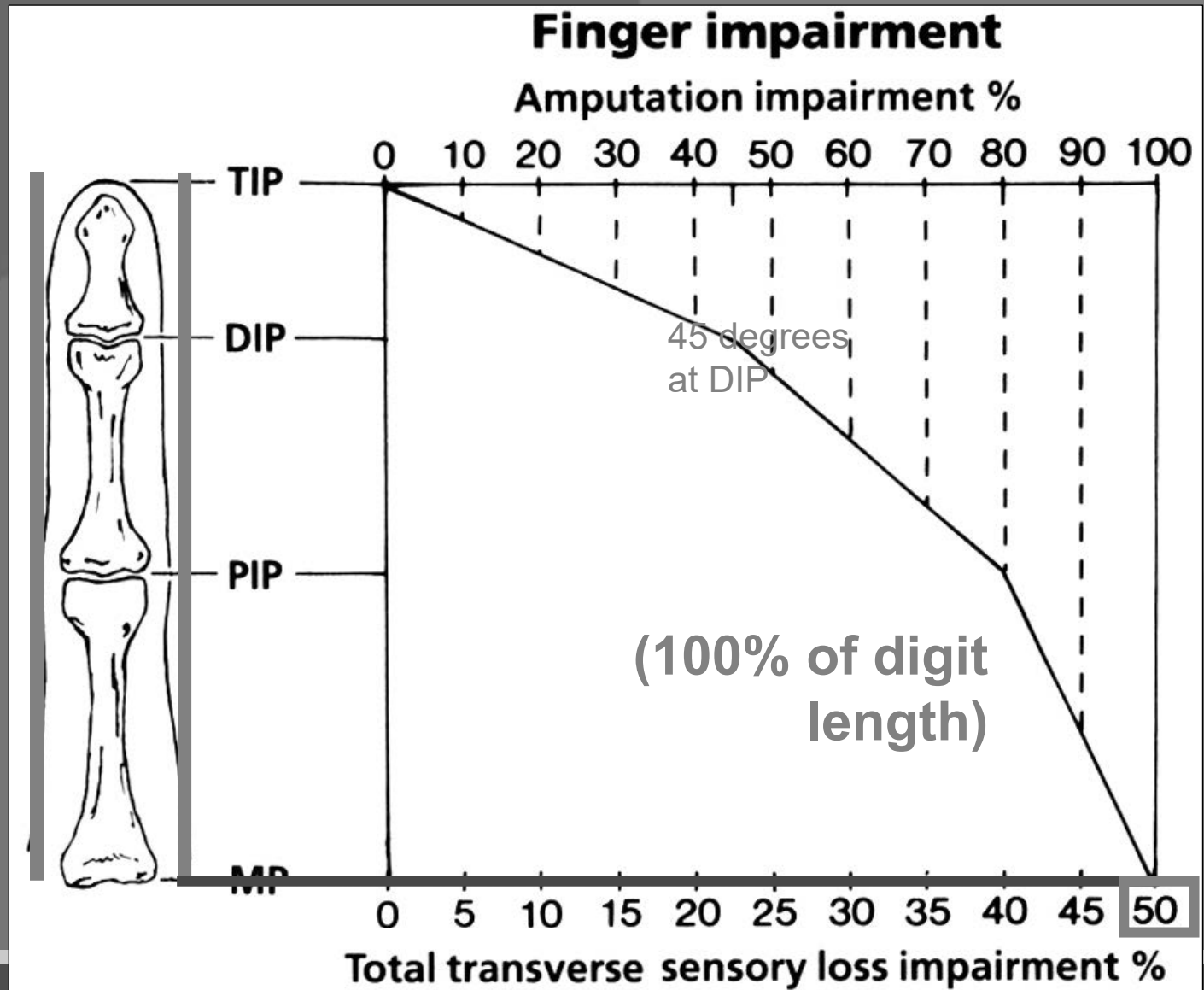
UE Case 2 Middle Finger Sensory Loss

Figure 17,
Page 30

Measure
length of
sensory
loss

>15 mm =
total loss

50%
middle
finger



Middle Finger

Use Figure 1

- Combine ROM and sensory loss
- 50% cw 46% = 73% middle finger

Convert Digit to Hand

Table 1, Page 18

**73% middle finger impairment =
15% hand**

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



Sensory Loss of Digits – What About Longitudinal Sensory Loss?

Different Types

- Longitudinal Loss
 - One digital nerve
 - Impairment value varies as to side injured (radial vs. ulnar side of digit)
 - Be sure to read sections on proper use of Tables
 - Thumb/little – Table 4, page 25 and Table 8, page 31
 - Index, middle, ring – Table 9, page 31



Case 2 - Upper Extremity, HAND MMI/IR

- Thumb = 1% hand
- Index finger = 20% hand
- Middle finger = 15% hand
- Total hand impairment **ADD**
 - 1% + 20% + 15% = 36% hand
- Convert to UE then WP
- **36% hand = 32% UE = 19% WP**

Convert Hand to Upper Extremity

Table 2, Page 19

Table 2. Relationship of Impairment of the Hand to Impairment of the Upper Extremity.*

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

36% Hand = 32% Upper Extremity

*Consult Table 3 (p. 20) to convert upper extremity impairment to whole-person impairment.

Convert Digit to Hand

Table 3, Page 20

32% UE = 19% Whole Person



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

Figure 1. Upper Extremity Impairment Evaluation Record--Part 1 (Hand)**

 Side ☐ R ☒ L

 Name John Roughneck Age 25 Sex ☒ M ☐ F Dominant hand ☒ R ☐ L Date mm/dd/yy
 Occupation oil field worker Diagnosis left hand crush injury

Abnormal motion					Amputation	Sensory loss	Other disorders	Hand impairment%		
Record motion, ankylosis, and impairment %					Mark level & impairment %	Mark type, level, & impairment %	List type & impairment %	* Combine digit IMP% * Convert to hand IMP%		
		Flexion	Extension	Ankylosis	IMP%					
Thumb	IP	Angle°	70	10						
		IMP%	1	0			1			
	MP	Angle°	50	0			1			
		IMP%	1	0						
	CMC	Radial abduction	Angle°	70						
			IMP%	0				0		
		Adduction	CMS	1 (lack of)				0		
			IMP%	0						
		Opposition	CMS	7				1		
			IMP%	1						
Add impairment % CMC + MP + IP = 3% [1]					IMP % = [2]	IMP % = [3]		IMP % = [4]	Hand impairment % * Convert above 1%	

		Flexion	Extension	Ankylosis	IMP%					
Index	DIP	Angle°								
		IMP%								
	PIP	Angle°								
		IMP%								
	MP	Angle°								
		IMP%								
	• Combine impairment % MP + PIP + DIP = [1]						IMP % = 100 [2]	IMP % = [3]	IMP % = [4]	Hand impairment % * Convert above 20%
	Middle	DIP	Angle°	50	-10					
			IMP%	10	2				12	
		PIP	Angle°	60	-10				27	
IMP%			24	3						
MP		Angle°	70	0		16				
		IMP%	11	5						
• Combine impairment % MP + PIP + DIP = 46% [1]					IMP % = [2]	IMP % = 50 [3]	IMP % = [4]		Hand impairment % * Convert above 15%	

 Total hand impairment (Add hand impairment % for thumb + index + middle + ring + little finger) = 36%
 Upper extremity impairment (*Convert total hand impairment % to upper extremity impairment %) = 32%; enter on Part 2, Line II
 If hand region impairment is only impairment, convert upper extremity impairment to whole-person impairment: = 19%



Questions About Case 2 – UE MMI/IR?



Case 3 - Upper Extremity MMI/IR

History of Injury

- 25-year-old male waiter tripped and fell at work landing on outstretched left arm
- Sustained fracture of left distal radius
- Underwent open reduction and internal fixation (ORIF) with plating by orthopedist
- Fracture healed
- 12 visits of post-op PT with increased ROM and strength

Case 3 - Upper Extremity MMI/IR

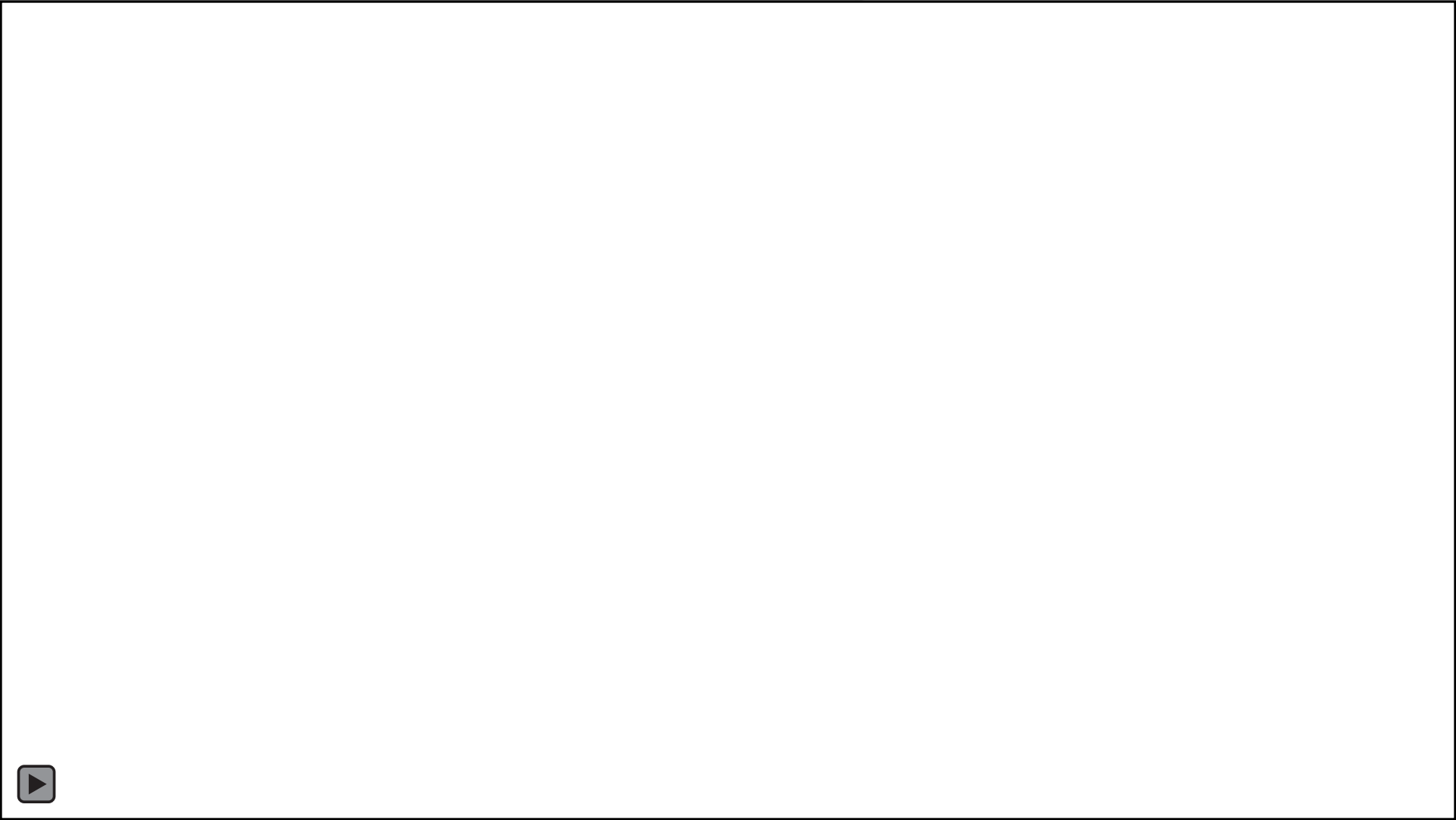
History of Injury (cont'd)

- Subsequently complained of pain and loss of sensation in left hand.
- Electrodiagnostic studies consistent with very severe median neuropathy
- Underwent nerve decompression 12 months post injury
- Reached clinical plateau with no reasonable anticipation of further material recovery or lasting improvement
- Saw Designated Doctor for MMI and IR

Case 3 - Upper Extremity MMI/IR

DD Medical History

- Loss of sensation left thumb and index finger which interferes but does not prevent sleep, playing guitar and other ADLs
- RTW as waiter





Case 3 - Upper Extremity MMI/IR

DD Physical Exam

- Well healed surgical scar left wrist
- ROM left wrist
 - Flexion 28°
 - Extension 18°
 - Radial deviation 5°
 - Ulnar deviation 15°
- ROM left forearm
 - Pronation 42°
 - Supination 58°



Case 3 - Upper Extremity MMI/IR

DD Physical Exam (cont'd)

- 5/5 strength of fingers, wrist and forearm muscles bilaterally
- 12 mm 2 point discrimination of palmar surface of radial and ulnar portions of left thumb and radial side of index finger
- 6 mm 2 point discrimination over all other parts of left hand

Case 3 - Upper Extremity MMI/IR

Based on medical records and physical exam, what is compensable injury for certifying MMI and IR?



Case 3 - Upper Extremity MMI/IR

Question for DD to consider in the exam:

On MMI date what is whole person IR?

Show your work!



Case 3 - Upper Extremity MMI/IR

On date of MMI, what is whole person IR?

- A. 28%
- B. 23%
- C. 18%
- D. 15%





Case 3 - Upper Extremity MMI/IR

What are you rating?

- Wrist and forearm ROM secondary to fracture
- RATE the LEVEL of the LESION!
- Sensory loss of median nerve
- Not digital nerves

Wrist Range of Motion

- Determine impairment values based Figure 26, page 36 and Figure 29, page 38
- **Round ROM to nearest 10° per written instructions for UD and RD, rather than 5° increments in Figure 29**
 - Appeals Panel decision 022504-s
- **Add different motion impairments of wrist**
- **Use Figure 1 – combine** with other UE impairments and convert to whole person using Table 3

Figure 26, page 36

- Flexion 28° rounds to $30^\circ = 5\%$ UE
- Extension 18° rounds to $20^\circ = 7\%$ UE
- $F + E = 12\%$ UE

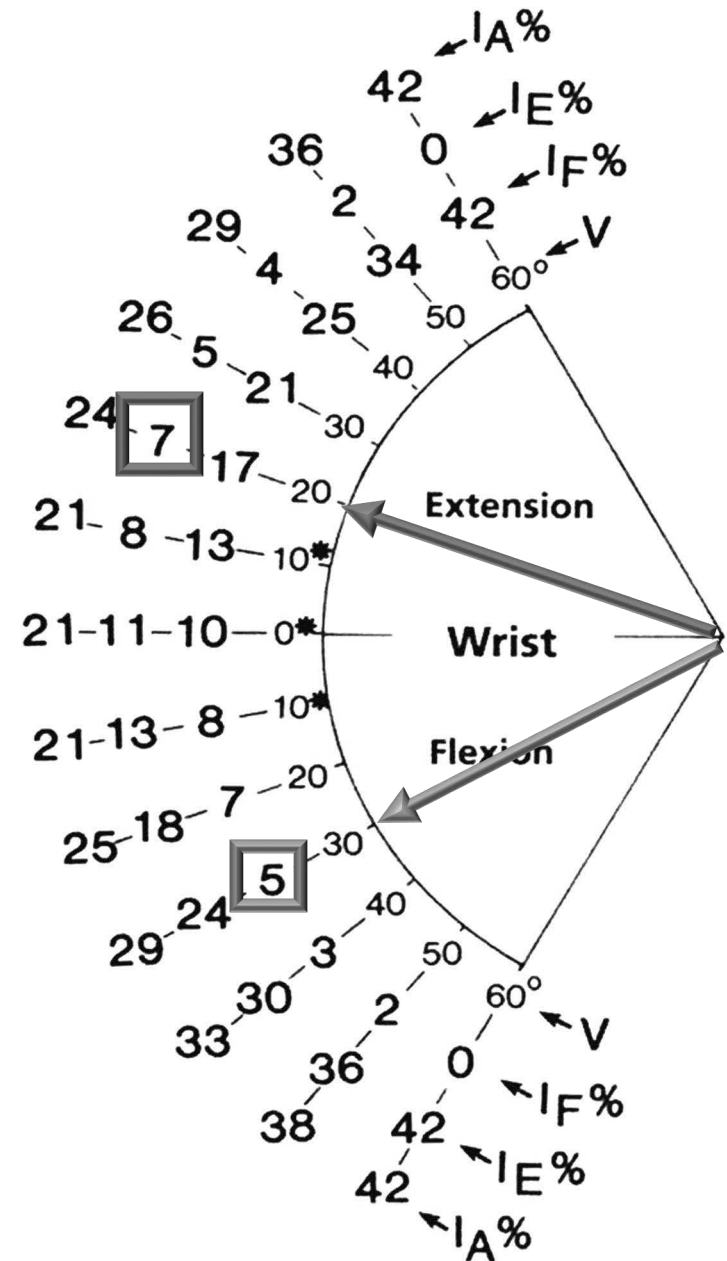
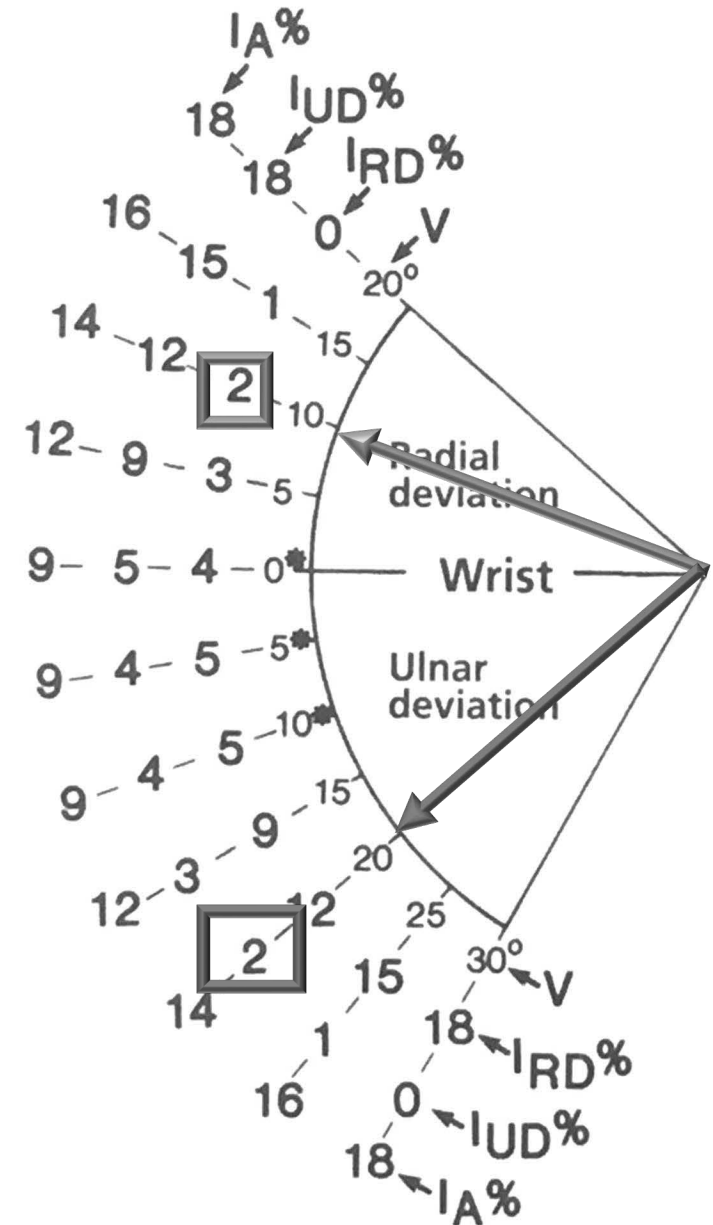


Figure 29, page 38

- Radial deviation 5° rounds to $10^\circ = 2\%$ UE
- Ulnar deviation 15° rounds to $20^\circ = 2\%$ UE
- $RD + UD = 4\%$ UE
ADD F/E + RD/UD
- $12\% \text{ UE} + 4\% \text{ UE} = 16\% \text{ UE}$





What About Supination and Pronation for Wrist Injuries?

- Pronation and supination discussed under elbow/forearm ROM
- See example of Colles fracture on page 72

Elbow/forearm Pronation and Supination

Supination 58° rounds to $60^\circ = 1\%$ UE

Pronation 42° rounds to $40^\circ = 3\%$ UE

$3\% \text{ UE} + 1\% \text{ UE} = 4\% \text{ UE}$

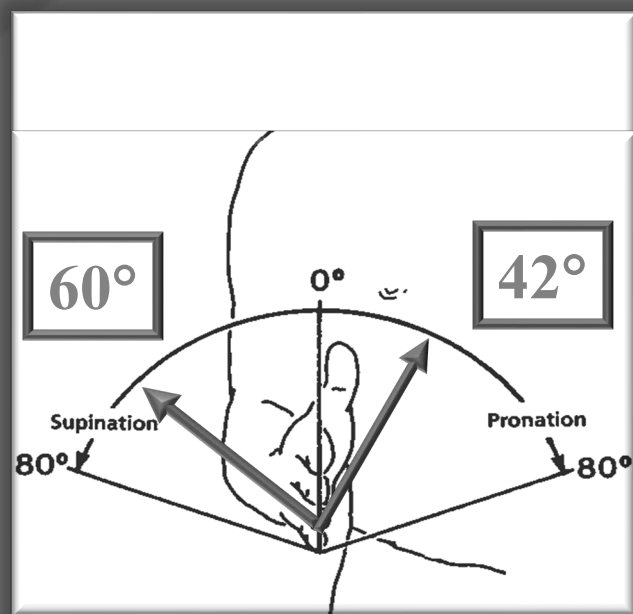


Figure 33, page 40

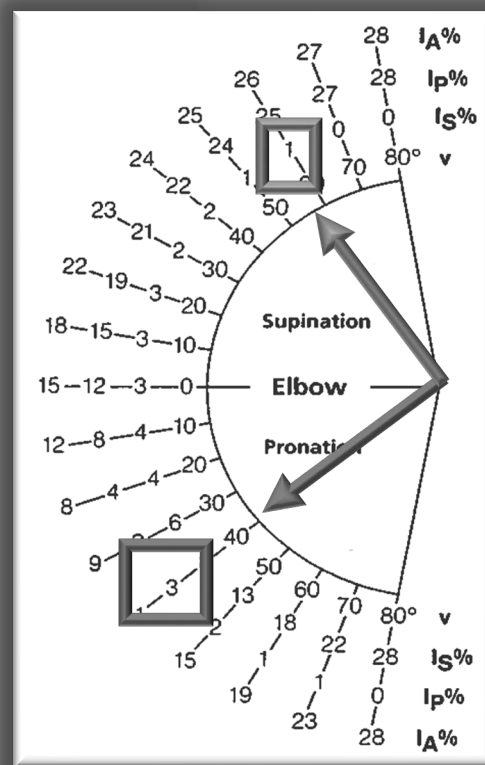


Figure 35, page 41 **TDI** Division of Workers' Compensation



Peripheral Nerve Disorders (*i.e., Carpal Tunnel Syndrome*)

- Peripheral nerve disorders such as carpal tunnel syndrome should be evaluated by sensory and motor nerve loss
- Do not use ROM for peripheral nerve disorders
- **BEST PRACTICE**
 - do not use Table 16, page 57
 - no definitions of mild, moderate, or severe



Entrapment Neuropathy

Table 16, Page 57

- Alternative method for rating entrapment neuropathy
- **No definitions of mild, moderate, or severe**
- Can be problematic given lack of criteria for selecting severity degree category
- If used, must sufficiently explain reason for selecting severity degree category
- ***Show your work!***

Case 3 – Anatomic Distribution of Median Nerve Sensory Loss

Loss of sensation of palmar surface of radial and ulnar portions of left thumb and radial side of index finger

Peripheral Nerve Disorders

Table 15, Page 54

Nerve	Maximum % upper extremity impairment*		
	Due to sensory deficit or pain †	Due to motor deficit ‡	Due to combined motor and sensory deficits
Pectorals (medial and lateral)	0	5	5
Axillary	5	35	38
Dorsal scapular	0	5	5
Long thoracic	0	15	15
Medial antebrachial cutaneous	5	0	5
Medial brachial cutaneous	5	0	5
Median (above midforearm)	38	44	65
Median (anterior interosseous branch)	0	15	15
Median (below midforearm)	38	10	44
Radial palmar digital of thumb	7	0	7
Ulnar palmar digital of thumb	11	0	11
Radial palmar digital of index finger	5	0	5
Ulnar palmar digital of index finger	4	0	4
Radial palmar digital of middle finger	5	0	5
Ulnar palmar digital of middle finger	4	0	4
Radial palmar digital of ring finger	2	0	2
Musculocutaneous	5	25	29
Radial (upper arm with loss of triceps)	5	42	45
Radial (elbow with sparing of triceps)	5	35	38
Subscapulars (upper and lower)	0	5	5
		16	20
		10	10
		46	50
Ulnar (below midforearm)	7	35	40
Ulnar palmar digital of ring finger	2	0	2
Radial palmar digital of little finger	2	0	2
Ulnar palmar digital of little finger	3	0	3

$$7\% + 11\% + 5\% = 23\% \text{ UE}$$



Case 3 - Sensory Loss of Median Nerve

Loss of sensation left thumb and index finger which interferes but does not prevent sleep, playing guitar and other ADLs

Peripheral Nerve Disorders

Table 11, Page 48

a. Classification

Grade	Description of sensory deficit or pain	% Sensory deficit
1	No loss of sensibility, abnormal sensation, or pain	0
2	Decreased sensibility with or without abnormal sensation or pain, which is forgotten during activity	1 - 25
3	Decreased sensibility with or without abnormal sensation or pain, which interferes with activity	26 - 60
4	Decreased sensibility with or without abnormal sensation or pain, which may prevent activity, and/or minor causalgia	61 - 80
5	Decreased sensibility with abnormal sensations and severe pain, which prevents activity, and/or major causalgia	81 - 100

$$23\% \text{ UE} \times .60 = 14\% \text{ UE}$$

Instructions From Page 48

Example: After an injury to his elbow, a man continued to have pain and abnormal sensations (minor causalgia) in the medial aspect of his right forearm that prevented activity.

1. Area of involvement is the medial aspect of right forearm (Fig. 45, p. 50).
2. Nerve involved is the medial antebrachial cutaneous (Table 10, p. 47).
3. Maximum loss of function due to sensory deficit is 5% (Table 15, p. 54).
4. Grade of sensory deficit or pain is 61% to 80% (Table 11a right); use maximum value.
5. Impairment of the upper extremity is calculated to be $80\% \times 5\%$, or 4%. This is equivalent to a 2% whole-person impairment (Table 3, p. 20).



Case 3 - Upper Extremity MMI/IR

- Wrist ROM = 16% UE
- Elbow/forearm ROM = 4% UE
- Median nerve sensory loss = 14% UE
- Combine
 - 16% UE cw 4% UE = 19% UE regional impairments (wrist and elbow/forearm)
 - 19% UE cw 14% UE = 30% UE *then* peripheral nerve
 - 30% UE = 18% WP (Table 3, page 20)

Convert Upper Extremity to Whole Person *Table 3, Page 20*

30% UE = 18% Whole Person



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

Figure 1. Upper Extremity Impairment Evaluation Record—Part 2 (Wrist, elbow, and shoulder) Side ☒ R ☐ L

 Name Leif Abigtip Age 25 Sex ☒ M ☐ F Dominant hand ☒ R ☐ L Date mm/dd/yy

 Occupation waiter Diagnosis left distal radius & ulner fractures
carpal tunnel syndrome

Abnormal motion					Other disorders	Regional impairment %	Amputation
Record motion, ankylosis and impairment %					List type & impairment %	• Combine [1] + [2]	Mark level & impairment %
Wrist		Flexion	Extension	Ankylosis	IMP%		
	Angle°	30	20		12		
	IMP%	5	7				
		RD	UD	Ankylosis	IMP%		
	Angle°	10	20		4		
	IMP%	2	2				
Add IMP% F/E + RD/UD = 16%					[1]	IMP% = [2]	
Elbow		Flexion	Extension	Ankylosis	IMP%		
	Angle°						
	IMP%						
		Pro	Sup	Ankylosis	IMP%		
	Angle°	40	60		4		
	IMP%	3	1				
Add IMP% F/E + PRO/SUP = 4%					[1]	IMP% = [2]	
Shoulder		Flexion	Extension	Ankylosis	IMP%		
	Angle°						
	IMP%						
		Add	Abd	Ankylosis	IMP%		
	Angle°						
	IMP%						
		Int Rot	Ext Rot	Ankylosis	IMP%		
	Angle°						

 II. Regional impairment of upper extremity
 • (Combine hand _____% + wrist 16% + elbow 4% + shoulder _____%)

= 19%

 III. Peripheral nerve system impairment
23% UE x 60%

= 14%

Total upper extremity impairment (• Combine I + II + III + IV + V)

= 30%

Impairment of the whole person (Use Table 3 p. 20)

= 18%



Other Issues

- Would you rate wrist ROM for CTS?
- What about grip strength?



Upper Extremity – Grip Strength

Strength Evaluation - 3.1 m (Pages 64-65)

- Rarely used, subject to patient effort
- If used, describe why this was a “rare case”
 - page 64

Upper Extremity – Grip Strength

Strength Evaluation - 3.1 m (Pages 64-65) (cont'd)

- Must determine maximal, valid effort
 - document findings in your report
 - 3 measurements each hand < 20% variation
 - 5 position grip – bell shaped curve
 - Rapid exchange grip
- Do not double rate with strength loss from nerve injury
- Use Tables and formulas on pages 64-65 to determine loss

Questions About Case 3 – UE MMI/IR?





RSD/CRPS

- Rate ROM loss
 - must be maximal and reproducible/consistent
- Rate sensory deficit/pain from Table 11, page 48
- Rate motor deficit of injured peripheral nerve, if it applies (i.e. CRPS II) from Table 12, page 49
- Combine sensory deficit/pain and motor deficit
- Combine ROM with value from sensory deficit/pain and motor deficit

Any Questions About UE MMI/IR?



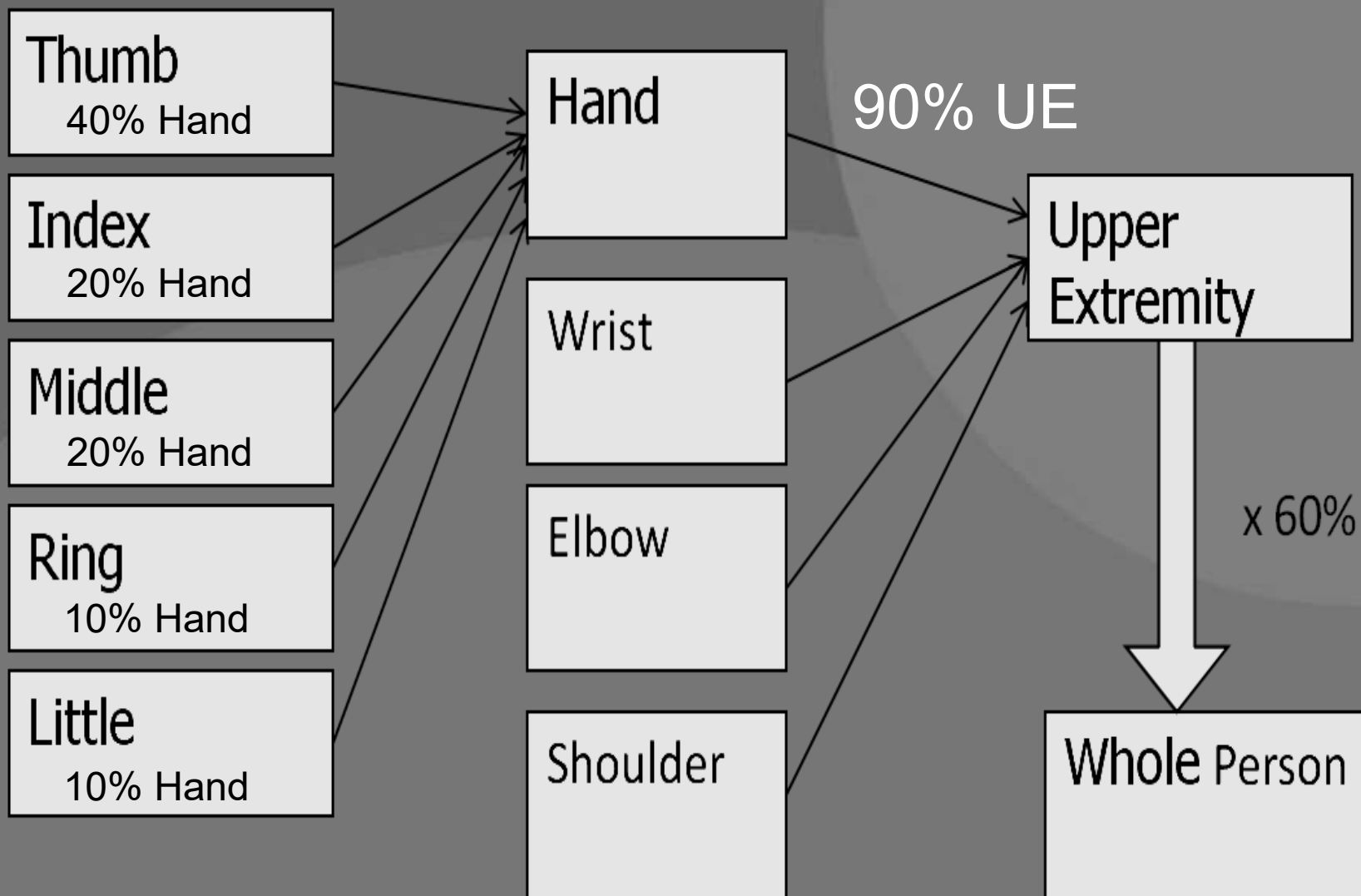
UPPER EXTREMITY PEARLS

This next section is for a review, but is important that you go to your AMA GUIDES TO PERMANENT IMPAIRMENT, 4th Edition and highlight, make notes etc.

The point is to have you learn the concepts and NOT memorize information.

- **MOST IMPORTANT
“REQUIREMENT”
FOR UPPER EXTREMITY
IMPAIRMENT
EVALUATION:**

Use Figure 1 - pp. 16-17



How to Determine Impairment Rating Hand and Upper Extremity

- No rating for hand/upper extremity dominance.
- No specific requirement (or prohibition) to measure the uninvolved contralateral upper extremity in the 4th Ed. of *Guides* (as per 3rd, 5th and 6th Editions).

How to Determine Impairment Rating Hand and Upper Extremity

- “Evaluating the range of motion of an extremity or the spine is a valid method of estimating an impairment. To some extent, however, the ROM is subject to the patient’s control. The results of such evaluations should be consistent and concordant with the presence or absence of pathologic signs or other evidence.” (p.14)

How to Determine Impairment Rating Hand and Upper Extremity

- **Active**, not passive range of motion (ROM) should be measured/rated; p. 15
- **Round UE ROM to nearest 10 degrees per written instructions** *AMA Guides* 4th ed., pp. 25-44 ;
also p. 15 (NOT 5 degree increments per Figure 29, p. 38 wrist RD/UD)
- Appeals Panel decision 022504-s,
decided November 12, 2002

How to Determine Impairment Rating Hand and Upper Extremity

- UE ROM - Guides, 4th do not directly address rounding 5 degrees; however generally recommended that <5 degrees round down,
≥5 degrees round up
- Do not round the WHOLE PERSON impairment rating in DWC system as instructed in *AMA Guides* (p. 9)

Rounding negative ROM degrees (extension lag/flexion contracture)

Section 3.1d Evaluating Abnormal Motion (p. 22)

“...a finger joint flexion contracture of 15° with flexion to 45° would be recorded as -15° to 45°. The motion of a finger joint that has 15° of hyperextension and 45° of flexion would be recorded as +15° to 45° (figure 6, p. 23). **The plus and minus signs are used to indicate, respectively, hyper-extension and extension lag and have no mathematical significance.**”

Since there is no mathematical significance to the plus or minus symbols of ROM degrees, all degrees can be rounded using the same **best practice** method: Round upper extremity ROM measurement degrees to the nearest 10° by rounding down when the number ends in 4 or less, and rounding up when the number ends in 5 or greater.

Remember - rounding to the nearest 10° DOES NOT apply to the lower extremity. For the lower extremity use the absolute measurement to determine the IR, including to stratify into a category, Example: Table 41 for the knee grades extension lag as Mild (5(-5 to -9 degrees), Moderate (-10 to -19 degrees) and Severe (-20 +).

How to Determine Impairment Rating Hand and Upper Extremity

- ROM
- Sensory loss of digits (Various Figures / Tables)
- ROM (Various Figures)
- Peripheral nerve disorders
 - Cervical Spinal Nerve Roots (Table 13)
 - Brachial Plexus (Table 14)
 - Major Peripheral Nerves (Table 15)
- Vascular Disorders
- “Other Disorders”

How to Determine Impairment Rating Hand and Upper Extremity

- COMBINE different TYPES of Impairment
- May combine as long as DIFFERENT body systems (Musculoskeletal / Nerve / Vascular)
- AVOID “double impairing” ROM loss IF the ROM loss is due to a nerve injury

How to Determine Impairment Rating Hand and Upper Extremity

ROM:

- Most values are recorded in degrees of motion as measured with a goniometer with a corresponding pie chart
- Thumb adduction, opposition, and radial abduction are the exceptions (Figures 9, 12, 14, and 16 on pp 26-29)

Abnormal Motion of the Digits

THUMB ROM:

Five Areas of Motion

- **ADD** impairment losses of *different* joints of thumb

NON-THUMB DIGITS (3 joints)

- **COMBINE** impairment losses of *different* joints of the Non-thumb digits
- Convert using Tables 1, 2, and 3 (use Fig. 1!)

What do you do with multiple types of impairments of a digit (range of motion, sensory, etc.)?

- Determine impairment from each TYPE of impairment (sensory, range of motion, amputation, other.)
- **COMBINE** the different TYPES to arrive at a *total impairment* for that *digit*.

Sensory Loss of the Digits

RATE THE LEVEL OF THE LESION!

Section 3.1c (p. 20 – 22, 24 – 31)

Sensory loss:

- Must be unequivocal and permanent (p. 20)
- Not an impairment of the dorsal surface

Impairment s are estimated according to the sensory quality and its distribution on the **PALMAR** aspect of the digits. Sensory loss on the DORSAL surface of the digits is NOT considered to be an impairment.”
(p.20)

Sensory Loss of the Digits

RATE THE LEVEL (and degree) OF THE LESION!

DIGIT - Determine Quality of Loss, p. 21

- Determine by **two-point exam**
- > 15 mm = **total** sensory loss, 100% sensory impairment
- 15 mm through 7 mm – **partial** sensory loss, 50% sensory impairment
- ≤ 6 mm is **normal**, 0% sensory impairment

Sensory Loss of the Digits

RATE THE LEVEL (and type) OF THE LESION!

DIGIT Transverse Loss

- a) Loss of function in **both digital nerves**
- b) 100% sensory loss and receives 50% value of the amputation value at that level
- c) Thumb – Figure 7, p. 24
- d) Fingers – Figure 17, p. 30

Sensory Loss of the Digits

RATE THE LEVEL (and type) OF THE LESION!

DIGIT Longitudinal Loss

- a) One Digital Nerve
- b) Impairment value varies as to side injured (radial vs. ulnar side of digit)
- c) Be sure to read sections on proper use of Tables
- d) Thumb/little – T.4, p. 25 and T. 8, p. 31
- e) IF impairment at different level / degree of radial and ulnar side, rate each side and ADD for the sensory loss of the digit

Amputation

Loss of entire UE – 60% WP

Rate DIGIT amputation:

- Per Figure 7 (thumb)
- Per Figure 17 (finger), Figure 3
- Per Figure 3 (impairments of the digits and hand)
- Per Figure 2 (impairments of the UE)
- **Use Figure 1 – Part 1 and Part 2**

If digits – COMBINE with other digit impairments

If digit – Convert digit to hand using T. 1, p. 18 AND convert hand to UE using T. 2, p. 19

Convert UE to WP if no other UE ratings using T. 3, p. 20

What if more than one digit has an impairment?

1. Determine the impairment of *each individual digit*.
2. **Convert** each digit impairment to a **hand** impairment using T. 1.
3. **Add** the **hand** impairments for each digit (I-V) for a ***total hand impairment***
4. Convert hand to UE using Table 2
5. Convert UE to whole person using Table 3

Peripheral Nerve Disorders

RATE THE LEVEL OF THE LESION! (Tables 13 / 14/ 15)

Section 3.1k(p. 26)

Cervical Spinal Roots (Table 13)

*If you determine that there is a specific spinal nerve root injury / deficit, that is NOT rate-able per the SPINE section (i.e. nerve root avulsion)

Brachial Plexus (Table 14)

*If you determine that there is a brachial plexus injury / deficit.

Major Peripheral Nerves (Table 15)

*If you determine that there is a specific Major Peripheral nerve (cutaneous, pure motor or mixed.)

Peripheral Nerve Disorders

RATE THE LEVEL OF THE LESION! (Tables 13 / 14/ 15)

Section 3.1k – Table 11 – PAIN / SENSORY deficits
(p. 46)

- How does deficit interfere with ADL that is present at MMI?
- Does it follow a defined, specific anatomic distribution? (nerve root, plexus, peripheral nerve)
- Is the injury/condition consistent with a peripheral nerve disorder?

Peripheral Nerve Disorders

RATE THE LEVEL OF THE LESION! (Tables 13 / 14/ 15)

Section 3.1k – Table 11 – MOTOR deficits (p. 47)

- Is there a loss of strength, or specific muscle loss of function, that is present and reproducible on the clinical exam?
- Is this consistent with the injury, clinical condition and prior medical records?
- Is the strength loss in a defined, specific anatomic pathway of the injured nerve? (nerve root, plexus, peripheral nerve)

Peripheral Nerve Disorders

Section 3.1k – Table 11 – Motor deficits (p. 47)

**USE INSTEAD OF AND DO NOT COMBINE WITH
SECTION 3.1M METHODS:**

- Loss of strength section 3.1m (Impairment due to other disorders of the UE). [Rarely used]
- Entrapment Neuropathy – Table 16 (p. 57)
- Grip Strength Loss – Tables 31 – 34 (p. 64-65)

Peripheral Nerve Disorders

RATE THE LEVEL OF THE LESION! (Tables 13 / 14/ 15)

*Estimate the sensory deficit/pain from Table 11, p. 48

*Estimate the motor deficit from Table 12, P. 49.

***Multiply the severity of the sensory or motor deficit by the appropriate percentage** from Table 13 (p. 51), Table 14 (p. 52) or Table 15 (p. 54).

*COMBINE the sensory and motor deficits to give an UE IR value.

***Use Figure 1 – Part 2 – COMBINE** with other UE impairments.

*Convert to Whole Person using T. 3, p. 20.

Peripheral Nerve Disorders

- Restricted UE ROM strictly **due to** peripheral nerve lesion should **NOT** be rated with ROM method - p. 46.
- If restricted ROM is **not** strictly due to peripheral nerve disorder and there is a SEPARATE MSK condition, then ROM can be combined with peripheral nerve disorder impairment. (p. 84)
- Rate pain/sensory deficits and/or motor deficits.

Carpal Tunnel Syndrome

- Carpal tunnel syndrome and other major peripheral nerve disorders should be evaluated by sensory and motor nerve loss.
- Don't use ROM
- **Best Practice** don't use T. 16, P. 57 - no definitions of mild, moderate, or severe.

Entrapment Neuropathy

T. 16, P. 57

- Alternative method for rating entrapment neuropathy
- **No definitions of mild, moderate, or severe**
- Can be problematic given lack of criteria for selecting the severity degree category
- If used, explain your reason for selecting the severity degree category

SHOW YOUR WORK!

Vascular Disorders

- Section 3.1 L
- Use T. 17, p. 57
- Difficult to find exact situation with every patient
- Combine vascular rating with amputation when amputation is due to peripheral vascular disease, T. 17, p. 57

UPPER EXTREMITY Other Disorders

- Section 3.1m (p. 58)
- Impairments are under two different classes of disorders:
 - I. Bone and Joint Deformities, p. 58
 - II. Musculotendinous Impairments, p. 63

READ requirements and examples closely

Impairment Due to Other Disorders of the Upper Extremity

I. Bone & Joint Deformities

- A. Joint Crepitation with Motion
- B. Joint Swelling due to synovial hypertrophy
- C. Digit Lateral Deviation
- D. Digit rotational deformity

Impairment Due to Other Disorders of the Upper Extremity

I. Bone & Joint Deformities (continued...)

E. Persistent joint subluxation or dislocation

F. Joint instability

G. Wrist and elbow joint radial and ulnar deviation

H. Carpal instability

I. Arthroplasty

Impairment Due to Other Disorders of the Upper Extremity

II. Musculotendinous Impairments

A. Intrinsic Tightness

B. Constrictive Tenosynovitis

C. Extensor Tendon Subluxation at the MP Joint

Hand and Upper Extremity Pearls

Multiple Upper Extremities

- Determine whole person impairment from each upper extremity
- Combine whole person impairment from each upper extremity to give total whole person impairment
 - Appeals Panel Decision 061569-s

Hand and Upper Extremity Pearls

WHEN TO ADD:

- ADD ROM losses within a joint of any upper extremity joint
- ADD ALL ROMS within a joint AND joint to joint in the thumb
- ADD longitudinal sensory loss of the digit on the radial AND ulnar side of a single digit
- ADD each DIGIT impairment to achieve the impairment of the hand

Don't forget!

- Please submit your evaluation for the Upper Extremity MMI/IR presentation.
 - <https://www.tdi.texas.gov/wc/dd/training.html>
- Please submit your attestation form for the pre-recorded presentations.
 - <https://www.tdi.texas.gov/wc/dd/documents/ddattestation.pdf>

Thank you