Designated Doctor Case-Based Webinar Module 4

Lower Extremity MMI IR

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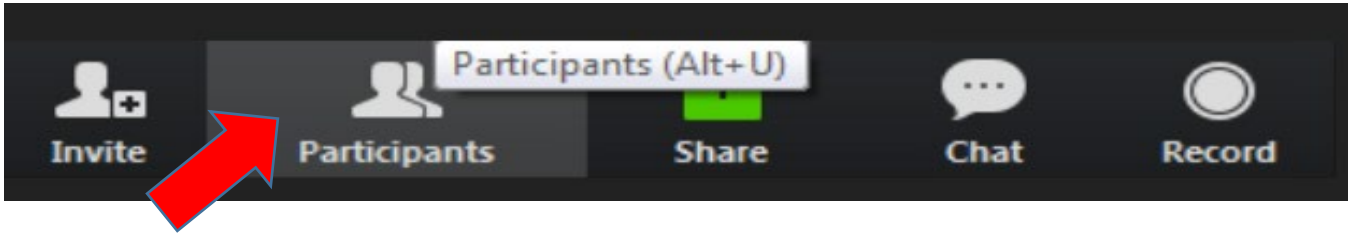
Housekeeping

At the bottom of your screen, click to turn on the participant list:



Ensure your name (not phone # or intitials) is shown on the Participant List for CME and attendance purposes. If not, do the following to rename:

Hover over your current sign in and two boxes appear

Click on the Rename box

Type in your first and last name

Asking questions

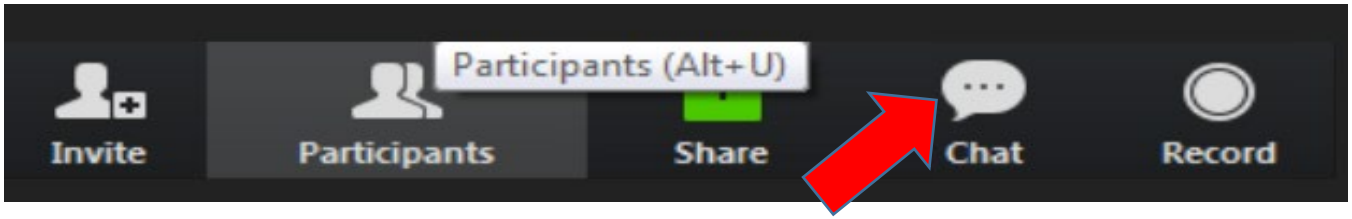
Please mute your phone/VOIP audio connection

All attendees will be muted during the presentation and submit questions via Chat

Attendees may be unmuted at the request of the monitor or instructor for clarification or further discussion

Asking questions

You will find the Chat feature to the right of the participants list.



As the instructor goes through the course they will ask for questions via chat at the end of a case, or after a concept has been explained.

You may type your questions into Chat. The Chat monitor may answer your question in Chat, or have the instructor answer the question verbally.

Conflict between DWC Statutes/Rules and AMA *Guides*

DWC Statutes/Rules take precedence

Combining Values in the Lower Extremity

- If the patient has several impairments of the same lower extremity part, such as the leg or impairments of different parts, such as the ankle and a toe, the whole-person estimates for the impairments are combined.
- New APD 211091-s, when using two ranges of motion in the same joint, they should also be combined (not added).
- APD 132734 - the DD has discretion to use both ranges of motion within a joint, or the most severe.
- If both extremities are impaired, the impairment of each should be evaluated and expressed in terms of the whole person, and the two percents should be combined

Combining 3 or More

- “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.**

Using the Combined Values Chart (pg.322)

Combined Values Chart

1	2																																						
2	3	4																																					
3	4	5	6																																				
4	5	6	7	8																																			
5	6	7	8	9	10																																		
6	7	8	9	10	11	12																																	
7	8	9	10	11	12	13	14																																
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26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45													
27	28	28	29	30	31	31	32	33	34	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47												
28	29	29	30	31	32	32	33	34	34	35	36	37	37	38	39	40	40	41	42	42	43	44	45	45	46	47	47	48											
29	30	30	31	32	33	33	34	35	35	36	37	38	38	39	40	40	41	42	42	43	44	45	45	46	47	47	48	49	50										
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32	33	33	34	35	35	36	37	37	38	39	39	40	41	42	42	43	44	44	45	46	46	47	48	48	49	50	50	51	52	52	53	54							
33	34	34	35	36	36	37	38	38	39	40	40	41	42	42	43	44	44	45	46	46	47	48	48	49	50	50	51	52	52	53	54	54	55						
34	35	35	36	37	37	38	39	39	40	41	41	42	43	43	44	45	45	46	47	47	48	49	49	50	51	51	52	52	53	54	54	55	56	56					
35	36	36	37	38	38	39	40	40	41	42	42	43	43	44	45	45	46	47	47	48	49	49	50	51	51	52	53	53	54	55	55	56	56	57	58				
36	37	37	38	39	39	40	40	41	42	42	43	44	44	45	46	46	47	48	48	49	49	50	51	51	52	53	53	54	55	55	56	56	57	58	58	59			
37	38	38	39	40	40	41	41	42	43	43	44	45	45	46	46	47	48	48	49	50	50	51	51	52	53	53	54	55	55	56	57	57	58	58	59	60	60		
38	39	39	40	40	41	42	42	43	44	44	45	45	46	47	47	48	49	49	50	50	51	52	52	53	54	54	55	55	56	57	57	58	58	59	60	60	61	62	
39	40	40	41	41	42	43	43	44	44	45	46	46	47	48	48	49	49	50	51	51	52	52	53	54	54	55	55	56	57	57	58	59	59	60	60	61	62	62	63

The values are deriv.d from the formula A+B (1–A)=*combined* value of A and B, where A and B are the decimal equivalents of the impairment ratings. In the chart all values are expressed as percents. To *combine* any two impairment values, locate the larger of the values on the side of the chart and read along that row until you come to the column indicated by the smaller value at the bottom of the chart. At the intersection of the row and the column is the combined value.

For example, to combine 35% and 20% read down the side of the chart until you come to the larger value, 35%. Then read across the 35% row until you come to the column indicated by 20% at the bottom of the chart. At the intersection of the row and column is the number 48. Therefore, 35% *combined* with 20% is 48%. Due to the construction of this chart, the larger impairment value must be identified at the side of the chart.

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.

Note: If impairments from two or more organ systems are to be *combined* to express a whole-person impairment, each must first be expressed as a whole-person impairment percent.

Lower Extremity MMI/IR Case 1

52-year-old warehouse supervisor sustained undisplaced right femoral intercondylar fracture falling down several steps, landing on right knee

Initial X-rays showed undisplaced right femoral intercondylar fracture and no osteoarthritis

Casted, healed without displacement

16 visits of PT with increased ROM but knee pain and weight bearing limitation persisted

RTW using an off-loading brace

Developed post-traumatic arthritis as part of injury

Lower Extremity MMI/IR Case 1

At MMI

- Standing x-rays reveal 2 mm joint space (2mm loss)
- Knee ROM
  - Flexion 110º and Extension 0º
  - Femoral –Tibial angle was 5º valgus

Lower Extremity MMI/IR Case 1

On date of MMI, what is whole person IR?

A. 10%
B. 8%
C. 4%
D. 2%

Lower Extremity MMI/IR Case 1

10% WP

Arthritis (2 mm) = 8% WP

- Table 62, page 83)

Diagnosis Based Estimates (DBE) undisplaced intercondylar fracture = 2% WP

- Table 64, page 85

See instructions pages 82, 83 and 84 re: combining arthritis and intra-articular fractures (DBE)

Combine post-traumatic arthritis 8% WP and undisplaced intercondylar fracture 2% = 10% WP

Lower Extremity MMI/IR Case 1
Table 62, Page 83

Table 62. Arthritis Impairments Based on Roentgenographically Determined Cartilage Intervals.

Joint	Whole-person (lower extremity) [foot] impairment (%)			
	Cartilage interval			
	3 mm	2 mm	1 mm	0 mm
Sacroiliac (3 mm)*	—	1 (2)	3 (7)	3 (7)
Hip (4 mm)	3 (7)	8 (20)	10 (25)	20 (50)
Knee (4 mm)	3 (7)	8 (20)	10 (25)	20 (50)
Patellofemoral†	—	4 (10)	6 (15)	8 (20)
Ankle (4 mm)	2 (5) [7]	6 (15) [21]	8 (20) [28]	12 (30) [43]
Subtalar (3 mm)	—	2 (5) [7]	6 (15) [21]	10 (25) [35]
Talonavicular (2 - 3 mm)	—	—	4 (10) [14]	8 (20) [28]
Calcaneocuboid	—	—	4 (10) [14]	8 (20) [28]
First metatarsophalangeal	—	—	2 (5) [7]	5 (12) [17]
Other metatarsophalangeal	—	—	1 (2) [3]	3 (7) [10]

*Normal cartilage intervals are given in parentheses.

†In a patient with a history of direct trauma, a complaint of patellofemoral pain, and crepitation on physical examination, but without joint space narrowing on roentgenograms, a 2% whole-person or 5% lower-extremity impairment is given.

Lower Extremity MMI/IR Case 1
Table 64, Page 85

Or estimate according to examination findings; use the greater estimate	
Trochanteric bursitis (chronic) with abnormal gait	3 (7)
Femoral shaft fracture	
Healed with 10°-14° angulation or malrotation	10 (25)
15°-19°	18 (45)
20°+	+1 (2) per degree up to 25 (62)

10°-19° angulation	10 (25)
20°+ angulation	+1 (2) per degree up to 20 (50)
Supracondylar or intercondylar fracture	
Undisplaced fracture	2 (5)
Displaced fracture	
5°-9° angulation	5 (12)
10°-19° angulation	10 (25)
20°+ angulation	+1 (2) per degree up to 20% (50%)
Total knee replacement including unicondylar replacement	
Good result, 85-100 points*	15 (37)
Fair result, 50-84 points*	20 (50)
Poor result, less than 50 points*	30 (75)

Lower Extremity MMI/IR Case 1
Page 82 Text

to range of motion findings. Roentgenograms of the hip joint are taken in the neutral position. The cartilage interval of the hip is relatively constant in the various positions. The ankle roentgenogram must be taken in a mortise view, but 10° flexion or extension is permissible. Evaluation of the foot requires a lateral view for the hindfoot and an anteroposterior view for the forefoot. If there is doubt or controversy about the suitability of a specific patient for this rating method, range of motion techniques may be used.

A patient who has an intra-articular fracture and then rapid onset of arthritis should be evaluated with this section and with Section 3.2i (p. 84) on diagnosis-based estimates.

Lower Extremity MMI/IR Case 1
Page 84 Text

and the nerve palsy. The estimates for the fracture and the nerve condition would be *combined* (Combined Values Chart, p. 322).

The final lower extremity impairment must not exceed the impairment estimate for amputation of the extremity, 100%, or 40% whole-person impairment.

Fractures in and about joints with degenerative changes should be rated either by using this section and combining (Combined Values Chart, p. 322) the rating for arthritic degeneration or by using the range of motion section. It is recommended that the section providing the greater impairment estimate be used.

Questions About Lower Extremity MMI/IR Case1?

Lower Extremity MMI/IR Case 2

32-year-old male custodian sustained severe inversion injury to left ankle with a non-displaced spiral fracture of left lateral malleolus; casted and fracture healed with no angulation

Lower Extremity MMI/IR Case 2

At MMI

- Dysesthesia over dorsal ankle and foot that made it difficult to wear lace-up shoes, with positive Tinel's sign over anterolateral distal fibula
- No motor or sensory deficit
- Range of motion of left ankle and hindfoot
  - plantar flexion 30º, extension 5º
  - inversion 10º, eversion 15º

Lower Extremity MMI/IR Case 2

On date of MMI, what is whole person IR?

A. 4%

B. 5%

C. 6%

D. 7%

Lower Extremity MMI/IR Case 2

6% WP

Range of motion

Left ankle

- Plantar flexion: 30° = 0% WP
- Extension: 5° = 3% WP

Ankle ROM = 3% WP

Left Hindfoot

- Inversion: 10° = 1% WP
- Eversion: 15° = 0% WP

Hindfoot ROM = 1% WP

ROM 3% WP cw 1% WP = 4% WP

Superficial Peroneal Nerve = 2% WP

ROM 4% WP cw dysethesia 2% WP

= **6% WP**

Lower Extremity MMI/IR Case 2
Ankle ROM, Table 42, Page 78

Table 42. Ankle Motion Impairments.

Motion	Whole-person (lower extremity) [foot] impairment		
	Mild: 3% (7%) [10%]	**Moderate: 6% (15%)** [21%]	**Severe: 12% (30%)** [43%]
Plantar flexion capability	11°-20°	1°-10°	None
Flexion contracture	—	10°	20°
Extension	10°- 0° (neutral)	—	—

Lower Extremity MMI/IR Case 2
Hindfoot ROM, Table 43, Page 78

Table 43. Hindfoot Impairments.

Motion	Whole-person (lower extremity) [foot] impairment	
	Mild: 1% (2%) [3%]	Moderate and severe: 2% (5%) [7%]
Inversion	10°-20°	0°-9°
Eversion	0°-10°	—

Lower Extremity MMI/IR Case 2

Table 68, Page 89

Dysesthesia Superficial Peroneal Nerve = 2% WP

Table 68. Impairments from Nerve Deficits.

	Whole-person (lower extremity) [foot] impairment (%)		
Nerve	**Motor**	**Sensory**	**Dysesthesia**
Femoral	15 (37)	1 (2)	3 (7)
Obturator	3 (7)	0	0
Superior gluteal	25 (62)	0	0
Inferior gluteal	15 (37)	0	0
Lateral femoral cutaneous	0	1 (2)	3 (7)
Sciatic	30 (75)	7 (17)	5 (12)
Common peroneal	15 (42)	2 (5)	2 (5)
Superficial peroneal	0	2 (5)	2 (5)
Sural	0	1 (2)	2 (5)
Medial plantar	2 (5) [7]	2 (5) [7]	2 (5) [7]
Lateral plantar	2 (5) [7]	2 (5) [7]	2 (5) [7]

Questions About Lower Extremity MMI/IR Case 2?

Lower Extremity MMI/IR Case 3

Injured employee involved in motor vehicle accident, injuring right hip, knee and ankle; underwent extensive treatment including ORIF for a femoral neck fracture, a TKR and a pantalar fusion.
He uses wheelchair for mobility

Lower Extremity MMI/IR Case 3

At MMI

- Knee replacement with poor result
- Healed femoral neck fracture in good position
- Hip ROM
  - flexion 80º, flexion contracture 10º
  - internal rotation 10º, external rotation 30º
  - abduction 20º, adduction 15º
- Pantalar **ankylosis** in neutral position (fusion of talus to all bones articulating with it: distal tibia, calcaneus, navicular and cuboid)

Lower Extremity MMI/IR Case 3

On date of MMI, what is whole person IR?

A. 44%

B. 40%

C. 38%

D. 30%

Lower Extremity MMI/IR Case 3

40% WP

- Gait – use other methods whenever possible
- Knee replacement with poor result = 30%
  - (Table 64, page 85)
- Hip ROM
  - flexion of 80^{o} = 2%
  - extension (10^{o} flexion contracture) = 2%
  - internal rotation of 10^{o} = 2%
  - external rotation of 30^{o} = 2%
  - abduction of 20^{o} = 2%
  - adduction of 15^{o} = 2%
  - may combine more than one ROM in a joint (APD) 211091-s
  - Total = 12%

Lower Extremity MMI/IR Case 3

Pantalar ankylosis = 10%
(page 81)

30% cw 12% = 38%
38% cw 10% = 44% WP

Don't exceed amputation value
(page 84)

Correct answer = <u>40%</u>

Lower Extremity MMI/IR Case 3
Table 64, Page 85

Total knee replacement with poor results

with abnormal gait	
Femoral shaft fracture	
Healed with 10°-14° angulation or malrotation	10 (25)
15°-19°	18 (45)
20°+	+1 (2) per degree up to 25 (62)
Supracondylar or intercondylar fracture	
Undisplaced fracture	2 (5)
Displaced fracture	
5°-9° angulation	5 (12)
10°-19° angulation	10 (25)
20°+ angulation	+1 (2) per degree up to 20% (50%)
Total knee replacement including unicondylar replacement	
Good result, 85-100 points*	15 (37)
Fair result, 50-84 points*	20 (50)
Poor result, less than 50 points*	30 (75)
Proximal tibial osteotomy	
Good result	10 (25)
Poor result	Estimate impairment according to examination and arthritic degeneration
Tibial shaft fracture, malalignment of	
10°-14°	8 (20)
15°-19°	12 (30)
20°+	+1 (2) per degree up to 20 (50)

*See Table 65 (p. 87) or Table 66 (p. 88) for point rating system.

**Refer also to section 3.4, p. 131.

Lower Extremity MMI/IR Case 3

Table 64, Page 85

Healed femoral neck fracture in good position

Hip	
Total hip replacement; includes endoprosthesis, unipolar or bipolar	
Good result, 85-100 points*	15 (37)
Fair result, 50-84 points*	20 (50)
Poor result, less than 50 points*	30 (75)
Femoral neck fracture, healed in	
Good position	Evaluate according to examination findings
Malunion	12 (30) plus range of motion criteria
Nonunion	15 (37) plus range of motion criteria
Girdlestone arthroplasty Or estimate according to examination findings; use the greater estimate	20 (50)
Trochanteric bursitis (chronic) with abnormal gait	3 (7)

Lower Extremity MMI/IR Case 3

Hip ROM

- flexion of 80º = 2%
- extension (10º flexion contracture) = 2%
- internal rotation of 10º = 2%
- external rotation of 30º = 2%
- abduction of 20º = 2%
- adduction of 15º = 2%
- may combine more than one ROM in joint (APD 211091-s)

Total = 12%

Lower Extremity MMI/IR Case 3

Table 40, Page 78

Motion	Whole-person (lower extremity) impairment (%)		
	Mild: 2% (5%)	**Moderate: 4% (10%)**	**Severe: 8% (20%)**
Flexion	Less than 100°	Less than 80°	Less than 50°
Extension	10°-19° flexion contracture	20°-29° flexion contracture	30° flexion contracture
Internal rotation	10°-20°	0°- 9°	
External rotation	20°-30°	0°-19°	
Abduction	15°-25°	5°-14°	Less than 5°
Adduction	0°-15°	—	—
Abduction contracture*	0°- 5°	6°-10°	11°-20°

Lower Extremity MMI/IR Case 3
Pantalar Ankylosis, Page 81

Table 57. Ankle Impairment* from Ankylosis in Valgus Position.

Valgus Position (°)	Whole-person (lower extremity) [foot] impairment (%)		
10 - 19	10	(25)	[35]
20 - 30	15	(37)	[53]
30+	21	(52)	[74]

*The appropriate ankylosis impairment percent is added to the impairment percent for ankylosis in the neutral position given in the text (p. 80).

Table 58. Ankle Impairment* from Ankylosis in Internal Malrotation.

Ankylosis impairment for loss of the tibia-os calcis angle is estimated according to Table 60 (below). The tibia-os calcis angle is made by the longitudinal axis of the os calcis and the longitudinal axis of the tibia with the ankle in neutral position (Fig. 57, p. 91).

For pantalar ankylosis, the optimal position is neutral; the impairment estimates for that position are 10% for the whole person, 25% for the lower extremity, and 35% for the foot. Further flexion, varus, and valgus impairments are estimated as shown in Tables 55 through 60 (pp. 80 and 81).

Toes

Table 61 (p. 82) indicates impairment estimates related to ankylosis of one or several toes. Figure 58

Lower Extremity MMI/IR Case 3

Gait – use other methods whenever possible

Knee replacement with poor result (Table 64, page 85)

= 30%

Hip ROM (Table 40, page 78)

= 12%

Lower Extremity MMI/IR Case 3

Pantalar ankylosis (page 81) = 10%

30% (TKR) cw 12% (femoral neck fx healed in good position) = 38%

38% cw 10% (pantalar ankylosis in neutral position) = 44% WP, which exceeds amputation value

Lower Extremity MMI/IR Case 3
Cannot Exceed The Amputation
Page 84

estimates made for both the hip joint impairment and the nerve palsy. The estimates for the fracture and the nerve condition would be *combined* (Combined Values Chart, p. 322).

The final lower extremity impairment must not exceed the impairment estimate for amputation of the extremity, 100%, or 40% whole-person impairment.

Fractures in and about joints with degenerative changes should be rated either by using this section and combining (Combined Values Chart, p. 322) the rating for arthritic degeneration or by using the range of motion section. It is recommended that the section providing the greater impairment estimate be used.

Therefore IR = 40% WP

Documenting Hip ROM

Table 40. Hip Motion Impairments.

Motion	Whole-person (lower extremity) impairment (%)		
	Mild: 2% (5%)	**Moderate: 4% (10%)**	**Severe: 8% (20%)**
Flexion	Less than 100°	Less than 80°	Less than 50°
Extension	10°-19° flexion contracture	20°-29° flexion contracture	30° flexion contracture
Internal rotation	10°-20°	0°- 9°	
External rotation	20°-30°	0°-19°	
Abduction	15°-25°	5°-14°	Less than 5°
Adduction	0°-15°	—	—
Abduction contracture*	0°- 5°	6°-10°	11°-20°

*An abduction contracture of greater than 20° is a 15% whole-person impairment.

The AMA Guides, Table 40, Hip Motion Impairments, can be confusing and lead to disputes.

Documenting Hip ROM

Table 40. Hip Motion Impairments.

Motion	Whole-person (lower extremity) impairment (%)		
	Mild: 2% (5%)	Moderate: 4% (10%)	Severe: 8% (20%)
Flexion	Less than 100°	Less than 80°	Less than 50°
Extension	10°-19° flexion contracture	20°-29° flexion contracture	30° flexion contracture
Internal rotation	10°-20°	0°- 9°	
External rotation	20°-30°	0°-19°	
Abduction	15°-25°	5°-14°	Less than 5°
Adduction	0°-15°	—	—
Abduction contracture*	0°- 5°	6°-10°	11°-20°

*An abduction contracture of greater than 20° is a 15% whole-person impairment.

*Notice that the more severe impairment has a greater number.

This is only logical if it is a LOSS of extension

Extension is noted on the table however, hip extension does not accrue impairment. Impairment for extension loss is measured and rated based on the presence and degree of flexion contracture.

Documenting Hip ROM

You can help avoid letters of clarification by following these best practices for documenting hip flexion contracture and hip extension your narrative report:

1. If there is **no flexion contracture**, explain that the absence of flexion contracture results in 0% impairment per Table 40.

2. If there is **flexion contracture**, provide the measurement finding, and explain the percent of impairment assigned per Table 40.

3. If you include any measurement finding of **extension**, clearly explain that any degree of extension is inconsistent with a flexion contracture and is not assigned an impairment rating per Table 40.

Questions About Lower Extremity MMI/IR Case 3?

Lower Extremity MMI/IR Case 4

- Injured employee sustained left distal fibula avulsion fracture
- Casted
- Healed without displacement

Lower Extremity MMI/IR Case 4

At MMI

- 2 cm of left calf atrophy
- Ankle ROM
  - Dorsiflexion 5º
  - Plantarflexion 40º
- Hindfoot ROM
  - Inversion 15º
  - Eversion 15º
- 3 mm of excess opening on stress x-ray

Lower Extremity MMI/IR Case 4

On date of MMI, what is whole person IR?

A. 1%

B. 2%

C. 3%

D. 4%

Lower Extremity MMI/IR Case 4

4% WP

- 2 cm of left calf atrophy = 3%-4%“moderate”
  - (Table 37, page 77)
- ROM
  - Ankle ROM = 3%
  - Hindfoot ROM = 1%
  - = **4% WP**
- 3 mm of opening on stress
- x-ray = 2% WP
  - (DBE Table 64, page 86)

Lower Extremity MMI/IR Case 4

Table 37. Impairments from Leg Muscle Atrophy.

Difference in circumference (cm)	Impairment degree	Whole-person (lower extremity) impairment (%)
a. Thigh: The circumference is measured 10 cm above the patella with the knee fully extended and the muscles relaxed.		
0 - 0.9	None	0
1 - 1.9	Mild	1 - 2 (3 - 8)
2 - 2.9	Moderate	3 - 4 (8 - 13)
3+	Severe	5 (13)
b. Calf: The maximum circumference on the normal side is compared with the circumference at the same level on the affected side.		
0 - 0.9	None	0
1 - 1.9	Mild	1 - 2 (3 - 8)
2 - 2.9	Moderate	3 - 4 (8 - 13)
3+	Severe	5 (13)

Lower Extremity MMI/IR Case 4

Table 42, Page 78

Dorsiflexion (Extension) 5º = 3% WP
Plantar flexion 40º = 0% WP

Motion	Whole-person (lower extremity) [foot] impairment		
	Mild: 3% (7%) [10%]	**Moderate: 6% (15%)** [21%]	**Severe: 12% (30%)** [43%]
Plantar flexion capability	11°-20°	1°-10°	None
Flexion contracture	—	10°	20°
Extension	10°- 0° (neutral)	—	—

Lower Extremity MMI/IR Case 4

Table 43, Page 78

Motion	Whole-person (lower extremity) [foot] impairment	
	Mild: 1% (2%) [3%]	**Moderate and severe: 2% (5%) [7%]**
Inversion	10°-20°	0°-9°
Eversion	0°-10°	—

Lower Extremity MMI/IR Case 4
Table 64, Page 86

Region and Condition	Whole-person (lower extremity) [foot] impairment (%)
Ankle	
Ligamentous instability (based on stress roentgenograms*)	
Mild (2 - 3 mm excess opening)	2 (5) [7]
Moderate (4 - 6 mm)	4 (10) [14]
Severe (>6 mm)	6 (15) [21]
Fracture	
Extra-articular with angulation	
10° - 14°	6 (15) [21]
15° - 19°	10 (25) [35]
20°+	+1 (2) [3] per degree

Region and Condition	Whole-person (lower extremity) [foot] impairment (%)
Forefoot deformity	
Metatarsal fracture with loss of weight transfer**	
1st metatarsal	4 (10) [14]
5th metatarsal	2 (5) [7]
Other metatarsal	1 (2) [3]
Metatarsal fracture with plantar angulation and metatarsalgia	
1st metatarsal	4 (10) [14]
5th metatarsal	2 (5) [7]
Other metatarsal	1 (2) [3]

Lower Extremity MMI/IR Case 4

2 cm of left calf atrophy =
3%-4%“moderate”
(Table 37, page 77)

ROM

- Ankle ROM = 3%
- Hindfoot ROM = 1%

= 4% WP

3 mm of opening on stress x-ray = 2% WP
(DBE Table 64, page 86)

Lower Extremity MMI/IR Case 4

Do not combine ROM and atrophy

- see comment on page 78
  - "…If the impairment is estimated on the basis of ankle and toe loss of motion, it should not be estimated on the basis of muscle atrophy also."

Lower Extremity MMI/IR Case 4

Page 78

Do not combine ROM and atrophy

Motion	Whole-person (lower extremity) [foot] impairment		
	Mild: 3% (7%) [10%]	**Moderate: 6% (15%)** [21%]	**Severe: 12% (30%)** [43%]
Plantar flexion capability	11°-20°	1°-10°	None
Flexion contracture	—	10°	20°
Extension	10°-0° (neutral)	—	—

Combined Values Chart (p. 322).

The whole-person impairment was 8%.

Comment: Comparing Tables 42 and 45 with Table 37 (p. 77), one can see that estimated impairment for loss of motion of the ankle and toes would exceed any estimated impairment for weakness or atrophy of the leg muscles. If the impairment is estimated on the basis of ankle and toe loss of motion, it should not be estimated on the basis of muscle atrophy also. Manual muscle testing is difficult to assess because of the lower leg muscles' limited range of motion of the ankle and toes.

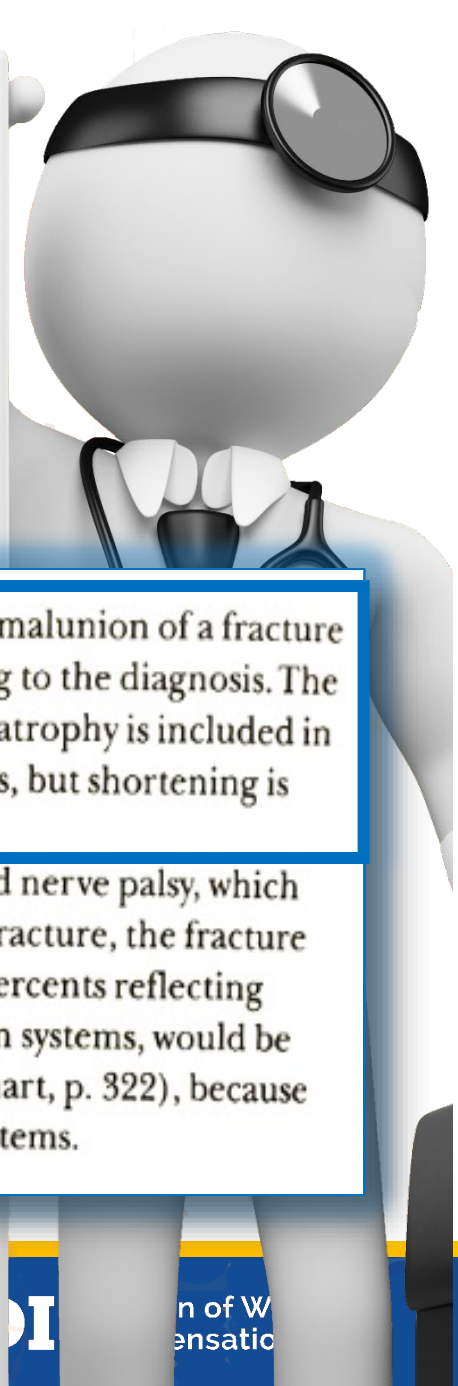
Lower Extremity MMI/IR Case 4

Do not combine DBE and atrophy

- see comment on page 84
  - "…The expected muscle weakness or atrophy is included in the diagnosis related estimates…"

Lower Extremity MMI/IR Case 4
Page 84

Do not combine ROM and atrophy



whether diagnostic or examination criteria best describe the impairment of a specific patient. *The physician, in general, should decide which estimate best describes the situation and should use only one approach for each anatomic part.* For instance, a patient with a femoral neck fracture with nonunion, who requires one crutch, should be rated either for use of the crutch or for the nonunion plus the range of motion restriction, whichever is greater.

There may be instances in which elements from both diagnostic and examination approaches will apply to a specific situation. A patient with an acetabular fracture and a sciatic nerve palsy should have

Comment: Impairment due to malunion of a fracture should be estimated according to the diagnosis. The expected muscle weakness or atrophy is included in the diagnosis-related estimates, but shortening is a different impairment.

If there were an associated nerve palsy, which usually does not occur with a fracture, the fracture and nerve palsy impairment percents reflecting impairments of different organ systems, would be *combined* (Combined Values Chart, p. 322), because they involve different organ systems.

Lower Extremity MMI/IR Case 4

Do not combine ROM and DBE

- see comments on page 75 and page 84
  - in general use only one method
- see comments on page 84
  - example of different organ systems

Lower Extremity MMI/IR Case 4
Page 75

Do not combine ROM and DBE

3.2 The Lower Extremity

Anatomic, diagnostic, and functional methods are used in evaluating permanent impairments of the lower extremity. While some impairments may be evaluated appropriately by determining the range of motion of the extremity, others are better evaluated by the use of diagnostic categories or according to test criteria.

In general, only one evaluation method should be used to evaluate a specific impairment. In some instances, however, as with the example on p. 77, a combination of two or three methods may be required.

This section includes information on using some

Table 35. Impairment from Limb Length Discrepancy.

Discrepancy (cm)	Whole-person (lower extremity) impairment (%)	
0-1.9	0	
2-2.9	2-3	(5-9)
3-3.9	4-5	(10-14)
4-4.9	6-7	(15-19)
5+	8	(20)

3.2b Gait Derangement

Lower Extremity MMI/IR Case 4
Page 84

Do not combine ROM and DBE

and the estimate will depend on the clinical manifestations.

The evaluating physician must determine whether diagnostic or examination criteria best describe the impairment of a specific patient. *The physician, in general, should decide which estimate best describes the situation and should use only one approach for each anatomic part.* For instance, a patient with a femoral neck fracture with nonunion, who requires one crutch, should be rated either for use of the crutch or for the nonunion plus the range of motion restriction, whichever is greater.

There may be instances in which elements from

bined Values Chart (p. 322). The lower extremity impairment is 31%, which is a 12% whole-person impairment.

Comment: Impairment due to malunion of a fracture should be estimated according to the diagnosis. The expected muscle weakness or atrophy is included in the diagnosis-related estimates, but shortening is a different impairment.

If there were an associated nerve palsy, which usually does not occur with a fracture, the fracture and nerve palsy impairment percents reflecting impairments of different organ systems, would be

Lower Extremity MMI/IR Case 4
Page 84

Do not combine ROM and DBE

crutch, should be rated either for use of the crutch or for the nonunion plus the range of motion restriction, whichever is greater.

There may be instances in which elements from both diagnostic and examination approaches will apply to a specific situation. A patient with an acetabular fracture and a sciatic nerve palsy should have estimates made for both the hip joint impairment and the nerve palsy. The estimates for the fracture and the nerve condition would be *combined* (Combined Values Chart, p. 322).

The final lower extremity impairment must not

If there were an associated nerve palsy, which usually does not occur with a fracture, the fracture and nerve palsy impairment percents reflecting impairments of different organ systems, would be *combined* (Combined Values Chart, p. 322), because they involve different organ systems.

Lower Extremity MMI/IR Case 4
Page 84

Do not combine ROM and DBE

whether diagnostic or examination criteria best describe the impairment of a specific patient. *The physician, in general, should decide which estimate best describes the situation and should use only one approach for each anatomic part.* For instance, a patient with a femoral neck fracture with nonunion, who requires one crutch, should be rated either for use of the crutch or for the nonunion plus the range of motion restriction, whichever is greater.

There may be instances in which elements from both diagnostic and examination approaches will apply to a specific situation. A patient with an acetabular fracture and a sciatic nerve palsy should have

Comment: Impairment due to malunion of a fracture should be estimated according to the diagnosis. The expected muscle weakness or atrophy is included in the diagnosis-related estimates, but shortening is a different impairment.

If there were an associated nerve palsy, which usually does not occur with a fracture, the fracture and nerve palsy impairment percents reflecting impairments of different organ systems, would be *combined* (Combined Values Chart, p. 322), because they involve different organ systems.

Lower Extremity MMI/IR Case 4
Page 84

Do not combine ROM and DBE

The final lower extremity impairment must not exceed the impairment estimate for amputation of the extremity, 100%, or 40% whole person impairment.

Fractures in and about joints with degenerative changes should be rated either by using this section and combining (Combined Values Chart, p. 322) the rating for arthritic degeneration or by using the range of motion section. It is recommended that the section providing the greater impairment estimate be used.

Lower Extremity MMI/IR Case 4
Table 64, Page 85

DBE exceptions that are combined with ROM

Hip	
Total hip replacement; includes endoprosthesis, unipolar or bipolar	
Good result, 85-100 points*	15 (37)
Fair result, 50-84 points*	20 (50)
Poor result, less than 50 points*	30 (75)
Femoral neck fracture, healed in	
Good position	Evaluate according to examination findings
Malunion	12 (30) plus range of motion criteria
Nonunion	15 (37) plus range of motion criteria

Lower Extremity MMI/IR Case 4

- **Do not** combine ROM and atrophy
- **Do not** combine DBE and atrophy
- **Do not** combine ROM and DBE
- **IR = 4% ("whichever is greater")**

Questions About Lower Extremity MMI/IR Case 4?

Questions About Lower Extremity MMI/IR?

Nerve deficits in the Lower Extremity create some concerns and questions

LE Peripheral Nerve Injuries

Chapter 3 Method – Section 3.2k.

- **pages 88 and 89 and TABLE 68.**

- Three categories of nerve impairment in the LE
  - motor deficits
  - sensory deficits
  - dysesthesia

- All estimates listed in Table 68 are for COMPLETE motor or sensory loss for named peripheral nerves

- Also, see APD 101481

LE Peripheral Nerve Injuries

Chapter 3 Method – Section 3.2k.

- Motor, sensory and dysesthesia estimates should be **combined** (text page 88)
  - Not all nerve lesions are COMPLETE.
  - What to do when there is an incomplete lesion? A couple of options
  - ALSO, are there problems with Table 68?

Peripheral Nerve Injures

Table 68. Impairments from Nerve Deficits.

	Whole-person (lower extremity) [foot] impairment (%)		
Nerve	**Motor**	**Sensory**	**Dysesthesia**
Femoral	15 (37)	1 (2)	3 (7)
Obturator	3 (7)	0	0
Superior gluteal	25 (62)	0	0
Inferior gluteal	15 (37)	0	0
Lateral femoral cutaneous	0	1 (2)	3 (7)
Sciatic	30 (75)	7 (17)	5 (12)
Common peroneal	15 (42)	2 (5)	2 (5)
Superficial peroneal	0	2 (5)	2 (5)
Sural	0	1 (2)	2 (5)
Medial plantar	2 (5) [7]	2 (5) [7]	2 (5) [7]
Lateral plantar	2 (5) [7]	2 (5) [7]	2 (5) [7]

LE Peripheral Nerve Injuries

- TABLE 68 (page 89)
  - Errors of OMISSION
  - Errors based on INCORRECT data
- Refer to Figures 59 and 60 on Page 93
- DO NOT just make up a value!

LE Peripheral Nerve Injuries

- TABLE 68 (page 89)
  - Errors based on OMISSIONS

    # **SAPHENOUS** extension of the FEMORAL (sensory)

    # TIBIAL after splits from SCIATIC NERVE at the popliteal region (sensory AND motor)

    # DEEP PERONEAL (sensory AND motor)

- *There is a method for the determining MOTOR nerve without Table 68.*

Peripheral Nerve Injures - OMISSIONS

Table 68. Impairments from Nerve Deficits.

	Whole-person (lower extremity) [foot] impairment (%)		
Nerve	**Motor**	**Sensory**	**Dysesthesia**
Femoral	15 (37)	1 (2)	3 (7)
Obturator	3 (7)	0	0
Superior gluteal	25 (62)	0	0
Inferior gluteal	15 (37)	0	0
Lateral femoral cutaneous	0	1 (2)	3 (7)
Sciatic	30 (75)	7 (17)	5 (12)
Common peroneal	15 (42)	2 (5)	2 (5)
Superficial peroneal	0	2 (5)	2 (5)
Sural	0	1 (2)	2 (5)
Medial plantar	2 (5) [7]	2 (5) [7]	2 (5) [7]
Lateral plantar	2 (5) [7]	2 (5) [7]	2 (5) [7]

Saphenous (S)

Tibial (M&S)

Deep Peroneal (M&S)

LE Peripheral Nerve Injuries

Chapter 3 Method – Section 3.2k.

- TABLE 68 (page 89)
  - Errors based on INCORRECT DATA

 # SUPERFICIAL PERONEAL
(Motor to Peroneal muscles)

 # OBTURATOR
(Sensory innervation of the medial thigh).

Peripheral Nerve Injures - ERRORS

Table 68. Impairments from Nerve Deficits.

	Whole-person (lower extremity) [foot] impairment (%)		
Nerve	**Motor**	**Sensory**	**Dysesthesia**
Femoral	15 (37)	1 (2)	3 (7)
Obturator	3 (7)	0	0
Superior gluteal	25 (62)	0	0
Inferior gluteal	15 (37)	0	0
Lateral femoral cutaneous	0	1 (2)	3 (7)
Sciatic	30 (75)	7 (17)	5 (12)
Common peroneal	15 (42)	2 (5)	2 (5)
Superficial peroneal	0	2 (5)	2 (5)
Sural	0	1 (2)	2 (5)
Medial plantar	2 (5) [7]	2 (5) [7]	2 (5) [7]
Lateral plantar	2 (5) [7]	2 (5) [7]	2 (5) [7]

LE Peripheral Nerve Injuries

Chapter 3 Method

- Alternate: Partial motor loss MAY be rated on basis of manual muscle testing per Section 3.2d:
  - # Table 39, page 77
  - # Text on page 76
- **Motor findings MUST be reproducible and consistent***
- Does not provide a method for partial sensory loss - would have to use another methodology.

Peripheral Nerve Injuries

USE TABLE 39 WHEN TABLE 68 **DOES NOT** HAVE A MOTOR NERVE LISTED

Table 39. Impairments from Lower Extremity Muscle Weakness.

Muscle group		Whole-person (lower extremity) [foot] impairment (%)				
		Grade 0	Grade 1	Grade 2	Grade 3	Grade 4
Hip	Flexion	6 (15)	6 (15)	6 (15)	4 (10)	2 (5)
	Extension	15 (37)	15 (37)	15 (37)	15 (37)	7 (17)
	Abduction*	25 (62)	25 (62)	25 (62)	15 (27)	10 (25)
Knee	Flexion	10 (25)	10 (25)	10 (25)	7 (17)	5 (12)
	Extension	10 (25)	10 (25)	10 (25)	7 (17)	5 (12)
Ankle	Flexion (plantar flexion)	15 (37) [53]	15 (37) [53]	15 (37) [53]	10 (25) [35]	7 (17) [24]
	Extension (dorsiflexion)	10 (25) [35]	10 (25) [35]	10 (25) [35]	10 (25) [35]	5 (12) [17]
	Inversion	5 (12) [17]	5 (12) [17]	5 (12) [17]	5 (12) [17]	2 (5) [7]
	Eversion	5 (12) [17]	5 (12) [17]	5 (12) [17]	5 (12) [17]	2 (5) [7]
Great toe	Extension	3 (7) [10]	3 (7) [10]	3 (7) [10]	3 (7) [10]	1 (2) [3]
	Flexion	5 (12) [17]	5 (12) [17]	5 (12) [17]	5 (12) [17]	2 (5) [7]

*Hip adduction weakness is evaluated as an obturator nerve impairment (Table 68, p. 89).

Peripheral Nerve Injuries – Table 39

USE TABLE 39 WHEN TABLE 68 **DOES NOT** HAVE A MOTOR NERVE LISTED

Table 39. Impairments from Lower Extremity Muscle Weakness.

Muscle group		Whole-person (lower extremity) [foot] impairment (%)				
		Grade 0	Grade 1	Grade 2	Grade 3	Grade 4
Hip	Flexion	6 (15)	6 (15)	6 (15)	4 (10)	2 (5)
	Extension	15 (37)	15 (37)	15 (37)	15 (37)	7 (17)
	Abduction*	25 (62)	25 (62)	25 (62)	15 (27)	10 (25)
Knee	Flexion	10 (25)	10 (25)	10 (25)	7 (17)	5 (12)
	Extension	10 (25)	10 (25)	10 (25)	7 (17)	5 (12)
	Flexion (plantar flexion)	15 (37) [53]	15 (37) [53]	15 (37) [53]	10 (25) [35]	7 (17) [24]
	Extension (dorsiflexion)	10 (25) [35]	10 (25) [35]	10 (25) [35]	10 (25) [35]	5 (12) [17]
	Inversion	5 (12) [17]	5 (12) [17]	5 (12) [17]	5 (12) [17]	2 (5) [7]
	Eversion	5 (12) [17]	5 (12) [17]	5 (12) [17]	5 (12) [17]	2 (5) [7]
Great toe	Extension	3 (7) [10]	3 (7) [10]	3 (7) [10]	3 (7) [10]	1 (2) [3]
	Flexion	5 (12) [17]	5 (12) [17]	5 (12) [17]	5 (12) [17]	2 (5) [7]

SCIATIC NERVE INJURY WITH REINNERVATION AND INTACT HAMSTRINGS BUT WEAK IN POSTERIOR TIBIAL NERVE

Peripheral Nerve Injures

Chapter 4 Method:

- Alternate: The Nervous System - pages 150 and 151
- Similar to UE methodology
- Consider this section for partial motor **and/or** sensory nerve loss where applicable

Peripheral Nerve Injures

Chapter 4 Method

- Determine appropriate peripheral nerve involved
- Take WP value from Chapter 3, Table 68, page 89 for **complete** motor or sensory loss
- **Multiply value for complete motor loss** (Table 68) by the **grade of the partial loss for motor deficit**
  - Chapter 4, **Table 21**, page 151
- **Multiply value for complete sensory loss** (Table 68) by the **grade of the partial loss for sensory deficit**
  - Chapter 4, **Table 20**, page 151
- Combine partial motor % WP with partial sensory % WP
  - Combined Values Chart, page 322

Chapter 4, Tables 20 and 21 - *Page 151*

Table 20. Classification and Procedure for Determining Impairment Due to Pain or Sensory Deficit Resulting from Peripheral Nerve Disorders.

a. Classification

Class	Description of sensory loss or pain	% Sensory impairment
1	No loss of sensation, abnormal sensation, or pain	0
2	Normal sensation except for pain, or decreased sensation with or without pain, forgotten during activity	1 - 25
3	Decreased sensation with or without pain, interfering with activity	26 - 60
4	Decreased sensation with or without pain or minor causalgia that may prevent activity	61 - 80
5	Decreased sensation with severe pain or major causalgia that prevents activity	81 - 95

b. Procedure

1. Identify the area of involvement, using the dermatome charts in Chapter 3 (pp. 50 and 52).
2. Identify the nerve, part of plexus, or root that innervates the area.
3. Find the value for maximum loss of function of the specific nerve or root due to pain or loss of sensation, using the appropriate table in the *Guides* chapter on the musculoskeletal system (Chapter 3, p. 13).
   Use Table 13 (p. 51) for the cervical roots; Table 14 (p. 52) for the brachial plexus; Table 15 (p. 54) for upper extremity nerves; Table 83 (p. 130) for the lumbosacral roots; and Table 68 (p. 89) for the lower extremity nerves.
4. Grade the degree of decreased sensation or pain according to the classification given above.
5. Multiply the percentage associated with the nerve identified in procedure 3 (above) by the percentage associated with the decreased sensation.
6. Determine other nerve impairments by the same procedure; *combine* the impairments using the Combined Values Chart (p. 322) to determine the whole-person impairment of the nervous system.

Table 21. Classification and Procedure for Determining Nervous System Impairment Due to Loss of Muscle Power and Motor Function Resulting from Peripheral Nerve Disorders.

a. Classification

Grade	Description of muscle function	% Motor deficit
5	Active movement against gravity with full resistance	0
4	Active movement against gravity with some resistance	1 - 25
3	Active movement against gravity only, without resistance	26 - 50
2	Active movement with gravity eliminated	51 - 75
1	Slight contraction and no movement	76 - 99
0	No contraction	100

b. Procedure

1. Identify the motion involved, such as flexion or extension.
2. Identify the muscle(s) performing the motion and the motor nerve(s) involved.
3. Grade the severity of motor deficit of the individual muscles according to the classification given above.
4. Find the maximum impairment due to the motor deficit for each nerve structure involved, as listed in Chapter 3: upper extremity (Table 15, p. 54), brachial plexus (Table 14, p. 52), lower extremity nerves (Table 68, p. 89); and lumbosacral nerves (Table 83, p. 130).
5. Multiply the severity of the motor deficit by the percentage associated with the nerve(s) identified in procedure 4 (above) to obtain the estimated impairment from strength deficit for each structure involved.

Peripheral Nerve Injures

Chapter 4 Method (cont'd)

- **What is missing from this CHAPTER 4 METHOD?**

- **Dysesthesia is either present or NOT; there is no partial.**

- **However, the higher levels of Table 20 include minor or major causalgia that interferes with activity – so IF assigning a higher value here, do not also rate dysesthesia.**

Thank you