DD Certification Course – Lower Extremity MMI/IR
Pre-Course Cases

Case 1

History of Injury

- 35-year-old construction worker that stepped in a hole, twisted his right knee, and "heard a pop"
- Immediate right knee pain
- Difficulty bearing weight and walking
- Seen at urgent care the day of the injury
- Diagnosed with knee sprain

Treatment History

- Initial treatment included rest, ice, compression, elevation, and ibuprofen
- Was placed on work restrictions
- Returned for follow up with treating doctor 1 week after injury
- Reported no improvement with persistent swelling and loss of range of motion
- Referred to physical therapy
- Participated in 8 sessions of PT over 4 weeks
- Treatment consisted of e-stim, ultrasound, heat, and manual therapy
- Returned to treating doctor at urgent care 5 weeks after injury
- Reported no change with PT. Continued complaints of knee pain, popping, and the feeling like his knee "wants to give way"
- Treating doctor referred him for an MRI
- MRI performed 6 weeks post injury showed a medial meniscus tear and near full thickness tear of the ACL
- Referred to an orthopedic surgeon who recommended arthroscopic partial medial meniscectomy and ACL reconstruction
- Carrier denied recommended surgical intervention
- Carrier accepted injury as "knee sprain" only
- Returned to treating doctor who ordered additional PT
- Completed 16 visits of active therapy 10 weeks post injury
    - Less swelling
    - Improved range of motion
    - Better strength
    - Improved functional activity
- Returned to work but was unable to perform duties such as ladder climbing, wheel barrow use, and extended standing
- Reported knee continued to "give way"
- Returned to orthopedic surgeon 16 weeks post injury, surgery was again recommended and was approved by the carrier

- Arthroscopic ACL reconstruction and partial medial meniscectomy performed at 18 weeks post injury
- Post operative physical therapy started at 20 weeks post injury
- Completed 18 visits of post-operative PT 30 weeks post injury

PT re-evaluation at 30 weeks post injury

- Therapy re-evaluation findings
- active knee ROM 125° to -5°
- flexion contracture -5°
- findings in medical records
- resisted knee flexion right 30#, left 35#
- unable to full unilateral weight bear
- unable to hold half squat on right leg
- complains of pain in right knee
- complains of intermittent swelling Additional PT requested but denied by carrier

DD Medical History – 36 weeks post injury

- Has returned to work with restrictions per treating doctor, and reports he can perform most of his duties
- Complaints of knee pain at the end of the work day
- Using NSAIDs as needed for pain control
- Feels like his “thigh is really weak”
- Scheduled to see the orthopedic surgeon next week
- Reports no recent give way episodes
- Stable vital signs, height 6 feet 1 inch, weight 180 pounds
- Right knee shows healed surgical scar and arthroscopic portals
- Gait shows slightly shortened swing and stance phase on right, but no assistive device used
- No obvious swelling or effusion
- Atrophy of right quadriceps
- right thigh circumference 51 cm
- left thigh circumference 53 cm
- 4+/5 strength of right knee extension and flexion
- Right knee ROM extension -5º and flexion 115º

Questions for Case 1

Based on Medical records and physical examination of the injured employee, what is the compensable injury for certifying MMI and IR?

For this case, we will provide the answer - consider the compensable injury to be:

- Traumatic ACL strain / tear
- Medical meniscus tear

Has MMI been reached, and if so, on what date?

- Yes, 4 weeks post injury, date completed initial PT
- Yes, 30 weeks post injury, date of post op PT re-evaluation
- Yes, 36 weeks post injury, date of DD exam
- No, not at MMI

Case 1 – The Sequel

DD Medical History – 48 Weeks Post Injury

- Injured employee returns for subsequent DD exam 3 months later after 10 additional postop PT sessions and home based exercise plan
- Released to work without restrictions at 38 weeks at IE's request
- PT discharge at 44 weeks post injury
- Records at PT discharge
- good progress with PT
- 5/5 right LE strength
- extension to 0º and flexion 135º
- continues his HEP and gym program
- Is currently working in a warehouse performing order fulfillment
- Operates a stand up forklift 8 hours a day
- Reports minimal right knee pain with resisted knee flexion activities such as going up steps, which he rates as "1/10"
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- Operates a stand up forklift 8 hours a day
- Reports minimal right knee pain with resisted knee flexion activities such as going up steps, which he rates as "1/10"
- Mildly positive anterior drawer
- 1+ Lachman's
- Right knee ROM
    - extension 0º
    - flexion 140º
- No atrophy, both thigh's circumferences measure 53 cm

Questions for Case 1 – The Sequel

Based on Medical records and physical examination of the injured employee, what is the compensable injury for certifying MMI and IR?

For this sequel case, consider the compensable injury to be:

- Traumatic ACL strain / tear
- Medical meniscus tear

Has MMI been reached, and if so, on what date?

A. Yes, 38 weeks post injury, when IE requested to be released to full duty
B. Yes, 44 weeks post injury, date discharged from PT
C. Yes, 48 weeks post injury, date of subsequent DDE
D. No, not at MMI

On the date of MMI, what is the whole person IR?

A. 0%
B. 1%
C. 3%
D. 4%

Case 1 – The Sequel, Additional Scenario 1

Condition at MMI

- ROM
  - extension 0º
  - flexion 105º
- Partial medial meniscectomy
- No cruciate ligament laxity

On the date of MMI, what is the whole person IR?

Fill in the blank: _____% WP

Case 1 – The Sequel, Additional Scenario 2

Condition at MMI

- ROM
  - extension 0º
  - flexion 130º
- No cruciate ligament laxity
- DD notes hat operative report describes surgical procedure as “arthroscopic medial meniscus repair and ACL reconstruction”

On the date of MMI, what is the whole person IR?

Fill in the blank: _____% WP

Case 1 – The Sequel, Additional Scenario 3

Condition at MMI

- ROM
  - Extension (flexion contracture) -5º
  - flexion 100º
- No cruciate ligament laxity
- DD notes that operative note describes surgical procedure as “arthroscopic medial meniscus repair and ACL reconstruction”

On the date of MMI, what is the whole person IR?

Fill in the blank: _____% WP

Case 1 – The Sequel, Additional Scenario 4

Condition at MMI

- Moderate knee OA (no change from preop). Antalgic gait with normal stance phase, and does not require cane or bracing
- ROM
  - extension 0º
  - flexion 120º
- No cruciate ligament laxity
- 1 cm right thigh atrophy
- DD notes that operative note describes surgical procedure as “arthroscopic partial medial meniscectomy and ACL reconstruction”

On the date of MMI, what is the whole person IR?

Fill in the blank: _____% WP

Case 1 – The Sequel, Additional Scenario 5

Condition at MMI

- Moderate knee OA (no change from preop). Antalgic gait with normal stance phase, and does not require cane or bracing
- Pre-op radiographic cartilage interval (RCA) medially was 4mm
- RCA at MMI was 2mm
- ROM
  - extension 0º
  - flexion 120º
- No cruciate ligament laxity
- 1 cm right thigh atrophy

- DD notes that operative note describes surgical procedure as “arthroscopic partial medial meniscectomy and ACL reconstruction”

On the date of MMI, what is the whole person IR?

Fill in the blank: _____% WP

Case 2

History of Injury

25-year-old laborer sustained an isolated non-displaced left proximal to mid-shaft lateral fibular fracture, with injury to superficial peroneal nerve.

Treatment History

- Seen in ER
  - X-rays and CT show isolated nondisplaced mid to distal fibular fracture
  - Orthopedic surgeon treated with a boot
  - Developed numbness over the dorsum of the foot
  - Weakness in the ankle everter muscles
- 8-18 weeks post injury
  - 24 visits of PT
- 16 weeks post injury
  - Follow-up x-rays showed healed fracture
- 24 weeks post injury - Orthopedic surgeon
  - Minimally decreased ankle ROM
  - Ankle eversion 4/5 all other muscles 5/5
  - Released RTW with restrictions
  - 3 month follow-up scheduled to evaluate nerve healing

DD Exam – 36 Weeks post injury

- DD Medical history
  - Left lower leg pain “2-3/10” chief complaint
  - Was working full time with restrictions for 12 weeks, then without restrictions for the last 2 weeks

DD Physical exam – 36 weeks post injury

- Vitals: Height 66 inches, weight 140 pounds, BP 120/78, pulse 64, respiration 14
- Walks without limp
- Does not require use of assistive device to walk
- Decreased sensation dorsum of the left foot that is forgotten with activity
- No abnormal or painful sensation
- Manual muscle testing shows 4/5 strength of ankle eversion
- Ankle plantar flexion, dorsiflexion, and inversion are 5/5
- Bilaterally symmetric calf and thigh circumference
- Knee Flexion 120º and extension 0º

- Plantar flexion 30º and dorsiflexion 12º
- Inversion 25º and eversion 15º

Based on the medical records and physical examination of the injured employee, what is the compensable injury for certifying MMI and IR?

For this case, consider the compensable injury to be:

- Non-displaced left lateral malleolar fracture
- Injury to superficial peroneal nerve

Has MMI been reached, and if so, on what date?

A. Yes, 18 weeks post injury, date completed 24 visits PT
B. Yes, 24 weeks post injury, date last saw orthopedic surgeon
C. Yes, 36 weeks post injury, date of DD exam
D. No, not at MMI

On the date of MMI, what is the whole person IR?

A. 0%
B. 1%
C. 2%
D. 3%

Case 3

History of Injury

- 58 year old librarian
- Was on a 3 rung step stool placing books on a shelf
- Missed the 2nd to the last step coming off the step stool, causing valgus twisting load to the right knee
- Went to the ER where X-rays were negative for fracture but positive for large suprapatellar effusion
- Established care with treating doctor the next week

Treating Doctor evaluation – 1 week post injury

- Complains of “8/10” “constant” pain and swelling
- Clinical Exam Right Knee
- Mildly antalgic gait
- ROM
    - extension - 4 º and
    - flexion 115º due to suprapatellar effusion
- Pain at the medial femur at MCL
- Mild joint line opening with valgus stress
- Trace laxity with anterior drawer, (-) posterior drawer
- Joint line pain medially > laterally

- Referred to PT
- Completed 10 sessions of PT six weeks post injury

Treating Doctor re-evaluation – 7 weeks post injury

- Exam findings unchanged from initial visit
- Reported swelling had gone down some, but pain was not improved with PT
- Knee feels unstable and has mechanical symptoms
- TD referred IE to orthopedist

IE evaluated by orthopedist 10 weeks post injury

- IE complained of constant pain in her right knee
- Reported that her right knee hurts worse at the end of the day and her knee would buckle when fatigued
- Taking ibuprofen for pain, using Voltaren gel

Orthopedic exam findings:

- Non-painful crepitation of the patella
- Range of motion 0 to 100 degrees, “limited by pain” but also by persistent effusion
- Muscle strength 5/5 in the affected LE, but 4/5 in the affected Quad
- “Positive McMurray’s" (no other specific information)
- 1-2 laxity with good endpoint with valgus stress compared to contralateral extremity. Complaints of pain at the distal medial femur
- Radiographs taken at orthopedic office show tricompartmental arthritis with severe narrowing of the medial compartment and a large effusion
- Cortisone injection performed by orthopedist
- Referred by orthopedist for MRI to “define the pathology”
- MRI performed 14 weeks post injury
    - MRI imaging at 14 weeks post-injury demonstrated:
        - Tricompartmental OA; medial > patellofemoral / > lateral.
        - Severe chondral thinning with associated osteophytes of the medial compartment
        - Moderate severe chondromalacia patellofemoral compartment
        - Mild chondromalacia lateral compartment
        - Large complex tear of posterior horn of medial meniscus with extrusion and horizontal signal changes in the posterior lateral meniscus
        - Large suprapatellar effusion
        - Large areas of bone marrow edema at the posterolateral corner and medical femoral condyle near MCL attachment
        - Incomplete bundles of the anterior cruciate ligament (ACL observed, with increased T2 signal changes of the ACL, consistent with acute / subacute tear
        - Acute / subacute intrasubstance signal changes in the MCL with questionable partial avulsion of proximal fibers at the medial femoral condyle

IE returns to orthopedist 16 weeks post injury

- Exam findings and subjective complaints unchanged from previous visit; having more give-away episodes
- Reported that injection provided relief for about 3 – 7 days
- Working without restrictions
- Diagnoses by orthopedist
    - •Medial meniscus tear
    - •ACL tear
    - •Osteoarthritis
- Due to no change with therapy or injection and continued pain, the orthopedist recommended knee replacement
- IE underwent total right knee arthroplasty 22 weeks post injury
- Completed post-surgical PT consistent with ODG 40 weeks post injury (18 weeks of therapy)
- Ortho exam at 50 weeks demonstrated extension lag of 20 degrees and contracture of -10 degrees.
- There was 2 cm calf atrophy

DD exam performed - 60 weeks post injury (32 weeks / 8 months after surgery)

- DD exam findings:
    - IE ambulates with cane out of preference, because she feels “uneasy" on her “new knee”
    - Has occasional moderate pain while walking longer than 10 minutes at a time
    - Knee pain rated 6/10, eased with use of ibuprofen
    - Reports difficulty kneeling and squatting to pick up objects from floor
    - Healed surgical scar consistent with TKA
    - No signs of infection
- ROM
    - extension -10º
    - flexion 100 º
    - Flexion contracture 5º and extension lag 5º
- Alignment 7º
- A-P instability 8 mm, M-L instability 7º
- Comparison to contralateral LE: 1 cm of calf atrophy at 12 cm
- 1.5 cm atrophy of right thigh at 10 cm

Based on Medical records and physical examination of the injured employee, what is the compensable injury for certifying MMI and IR?

A. Knee strain
B. ACL tear & MCL tear
C. Aggravation of Degenerative OA of the knee
D. Aggravation of Complex tear of medial meniscus

Has MMI been reached, and if so, on what date?

A. Yes, when completed 10 sessions of PT six weeks post injury.
B. Yes, 16 weeks post injury at orthopedic follow up
C. Yes, 40 weeks post injury, completion of post-op PT
D. Yes, Ortho exam at 50 weeks
E. Yes, 60 weeks, date of DD exam
F. No, not at MMI

On the date of MMI, what is the whole person IR?

A. 0%
B. 2%
C. 4%
D. 30%

Case 3 – Alternate Scenario

History of Injury

- 58 year old librarian
- Was on a 3 rung step stool placing books on a shelf
- Missed the last step coming off of the step stool, landing on the front of her knee
- Went to the ER, x-rays were negative for fracture but presence of tricompartmental OA
- Established care with treating doctor the next week with complaint of pain, swelling, and stiffness of the knee.

Physical exam 1 week post injury

Knee

- "8/10" "constant" pain
- mildly antalgic gait
- ROM
    - extension 0º
    - flexion 125º
- no laxity with anterior drawer, posterior drawer
- no laxity with medial or lateral stress testing
- "Positive McMurray's"
- Referred to PT

Treating doctor re-evaluation 7 weeks post injury

- Pain complaints unchanged
- Exam findings unchanged from initial visit
- Range of motion 0 to 125 degrees
- No laxity or MCL pain on medial stress testing

- TD referred to Orthopedist

IE evaluated by orthopedist -10 weeks post injury

- IE complained of constant pain in her right knee
- Reported that her knee hurts worse at the end of the day
- Taking ibuprofen for pain, using Voltaren gel
- Orthopedist exam findings
    - Tenderness with palpation of the patella
    - Range of motion 0 to 100 degrees “limited by pain”
    - Retropatellar crepitus noted with active and passive motion
    - Muscle strength 5/5
    - “Positive McMurray’s" (no specific remarks as to locatin or palpable meniscus movement)
    - Negative Lachman’s
    - No laxity with medial or lateral stress testing
- Radiographs taken at orthopedic office show tricompartmental arthritis with severe narrowing at the medial compartment
- Cortisone injection performed by orthopedist
- Referred by orthopedist for MRI to “rule out meniscus tear or other pathology.”
- MRI performed 14 weeks post injury
- MRI impression
    - Tricompartmental OA; medial > patellofemoral / > lateral.
    - Severe chondral thinning with associated osteophytes of the medial compartment
    - Moderate severe chondromalacia patellofemoral compartment
    - Mild chondromalacia lateral compartment
    - Large complex tear of posterior horn of medial meniscus with extrusion and horizontal signal changes in the posterior lateral meniscus
    - Subchondral cystic changes, but no other bone contusions / edema
    - Incomplete visualization of the anterior cruciate ligament with areas of thickening / scarring
    - Remaining ligaments, including MCL, intact without acute / subacute changes
    - Trace soft tissue swelling anterior to the patella, But, no contusion of the patella or femoral trochlea
    - Mild knee effusion

IE Returns to orthopedist - 16 weeks post injury

- Exam findings and subjective complaints unchanged from previous visit
- Reported that injectin provided relief for about 3 days
- Working without restrictions
- Diagnoses by orthopedist
    - Medial meniscus tear
    - ACL tear
    - Asteoarthritis
- Due to no change with therapy or injection and continued pain orthopedist recommended knee replacement
    - Initial request for surgery denied by carrier

    - Second request for surgery approved 34 weeks post injury
- IE underwent total right knee arthroplasty 36 weeks post injury
- Referred for post-surgical PT
- PT delayed by COVID19 infection causing respiratory compromise
- Post-surgical therapy started 46 weeks post injury

DD exam performed - 50 weeks post injury

- DD exam findings
    - IE ambulates with cane
    - Healed surgical scar at right knee
    - No swelling or signs of infection
    - Knee pain 6/10
    - ROM extension -10º, flexion 100º
    - Flexion contracture 5º (confirmed with passive ROM) and extension lag < 10º
    - Alignment 7º
    - A-P instability 8 mm, M-L instability 7º
    - No atrophy of calf or thigh
- Has completed 10 sessions of PT and reports that PT is helping
- Has not returned to work

Based on the medical records and physical examination of the injured employee, what is the compensable injury for certifying MMI and IR?

A. Knee contusion
B. ACL tear
C. Osteoarthritis of the knee
D. Complex tear of the medial meniscus

Has MMI been reached, and if so on what date?

A. Yes, 7 weeks post injury at follow up with treating doctor
B. Yes, 16 weeks post injury at orthopedic follow up after cortisone injection
C. Yes, 50 weeks post injury at DD examination
D. No, not at MMI

On the date of MMI, what is the whole person IR?

A. 2%
B. 12%
C. 30%