Lower Extremity Dislocations: Management and Triage on the Field

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Disclsures

- None

Purpose

- To provide you with knowledge which may guide you through the on-field management and triage of dislocations of the lower extremity

Lower Extremity Dislocations
(too many to cover)

- Hip
  (Femoroacetabular)
- Knee
  - Patellofemoral
  - Tibiofemoral
  - Proximal tibiofibular
- Ankle
  - Tibiotalar
  - Distal tibiofibular
- Foot
  - Subtalar
  - Lisfranc
    (Tarsometatarsal)
  - MTP
  - Interphalangeal

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Management and Triage

- Management
  - What do I do to the patient?
- Triage
  - What do I do with the patient?

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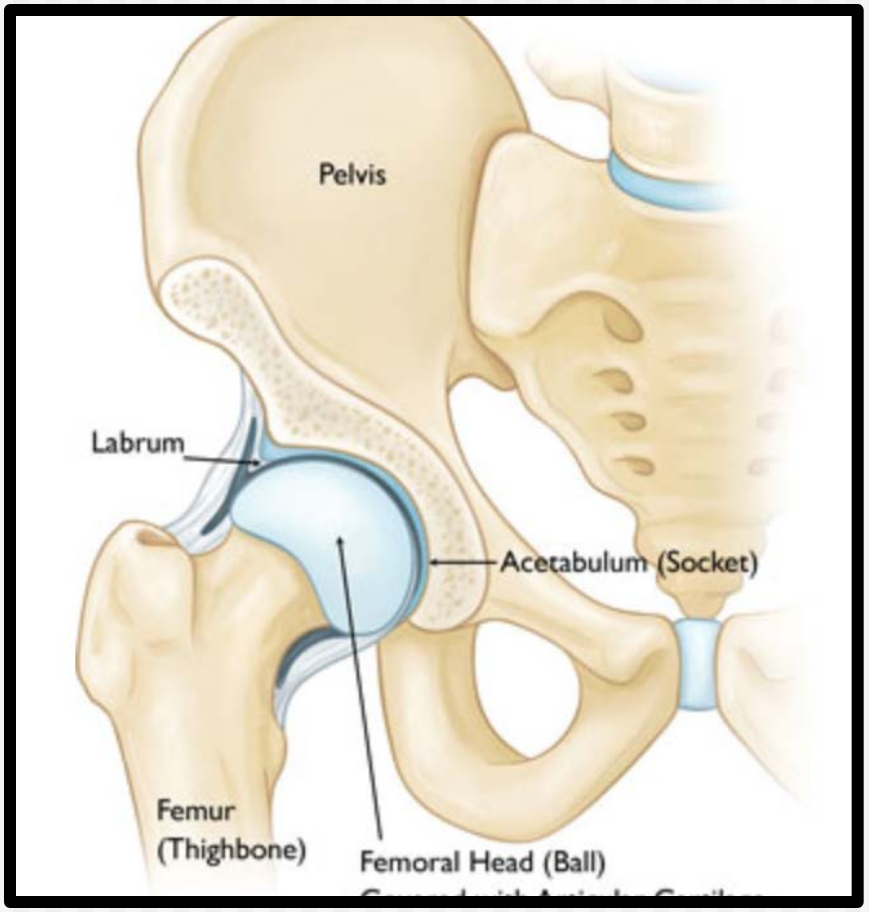
Hip Dislocations

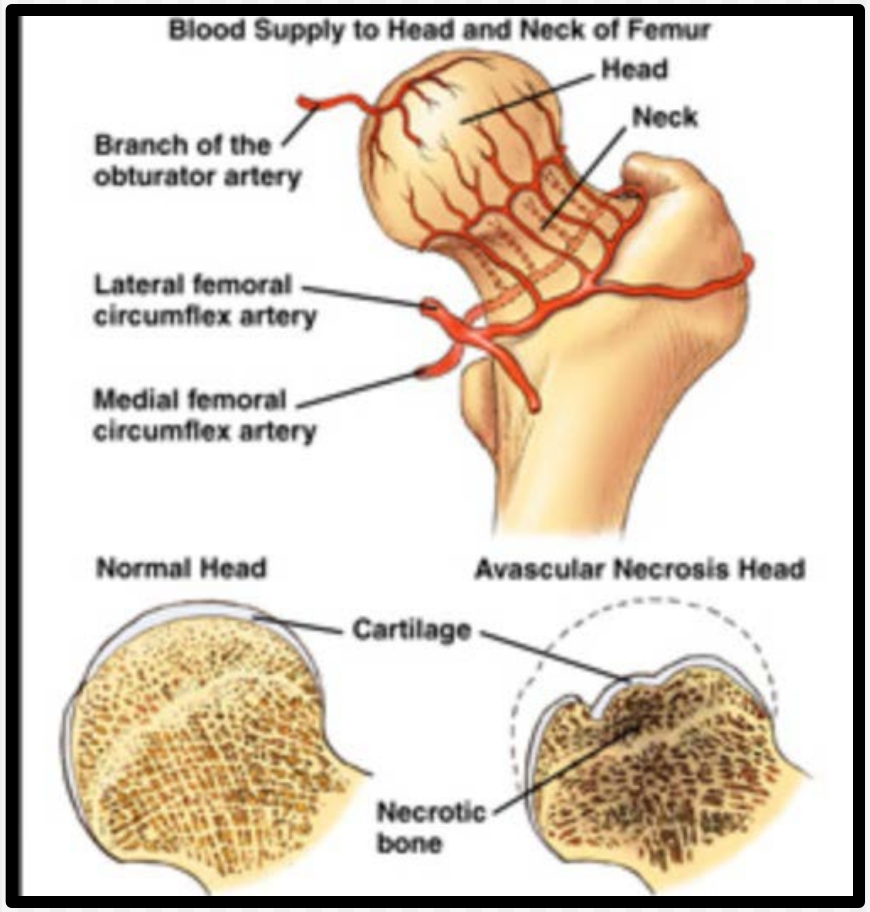
- Anatomy
- Types
- Issues
- Management and Triage

Hip Anatomy

- Ball and socket joint
- Stability due to conformity of joint, labrum, and capsule
- Blood supply



Blood Supply to the Hip



- Medial femoral circumflex
- Lateral femoral circumflex
- Obturator branch

Types of Hip Dislocations

- Posterior
  - Most common type (>90%)
  - Leg will be flexed slightly, adducted, and internally rotated
- Anterior
  - Less common
  - Leg will be flexed abducted, and externally rotated

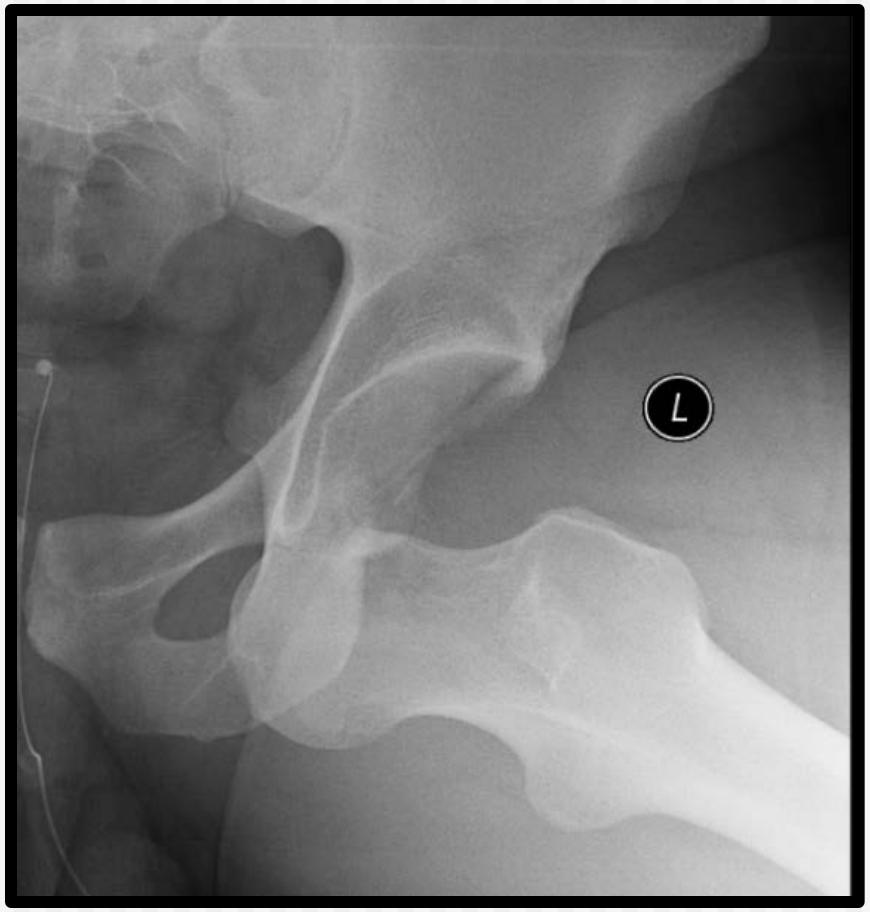
Issues to Consider

- With dislocation, there will be soft tissue trauma (ligaments, capsule, labrum, etc) along with possibility of……
  - Neurological compromise
  - Concurrent bony injury (fractures)
- Vascular flow to femoral head is compromised and must be restored ASAP to minimize risk of AVN

Management of Hip Dislocation on the Field

- Must make accurate diagnosis
  - Lots of pain with fixed posturing of leg
- Must do neurologic examination
  - Sciatic nerve at risk (esp peroneal division)
  - Foot drop most common

Radiographic Imaging



Management of Hip Dislocations on the Field

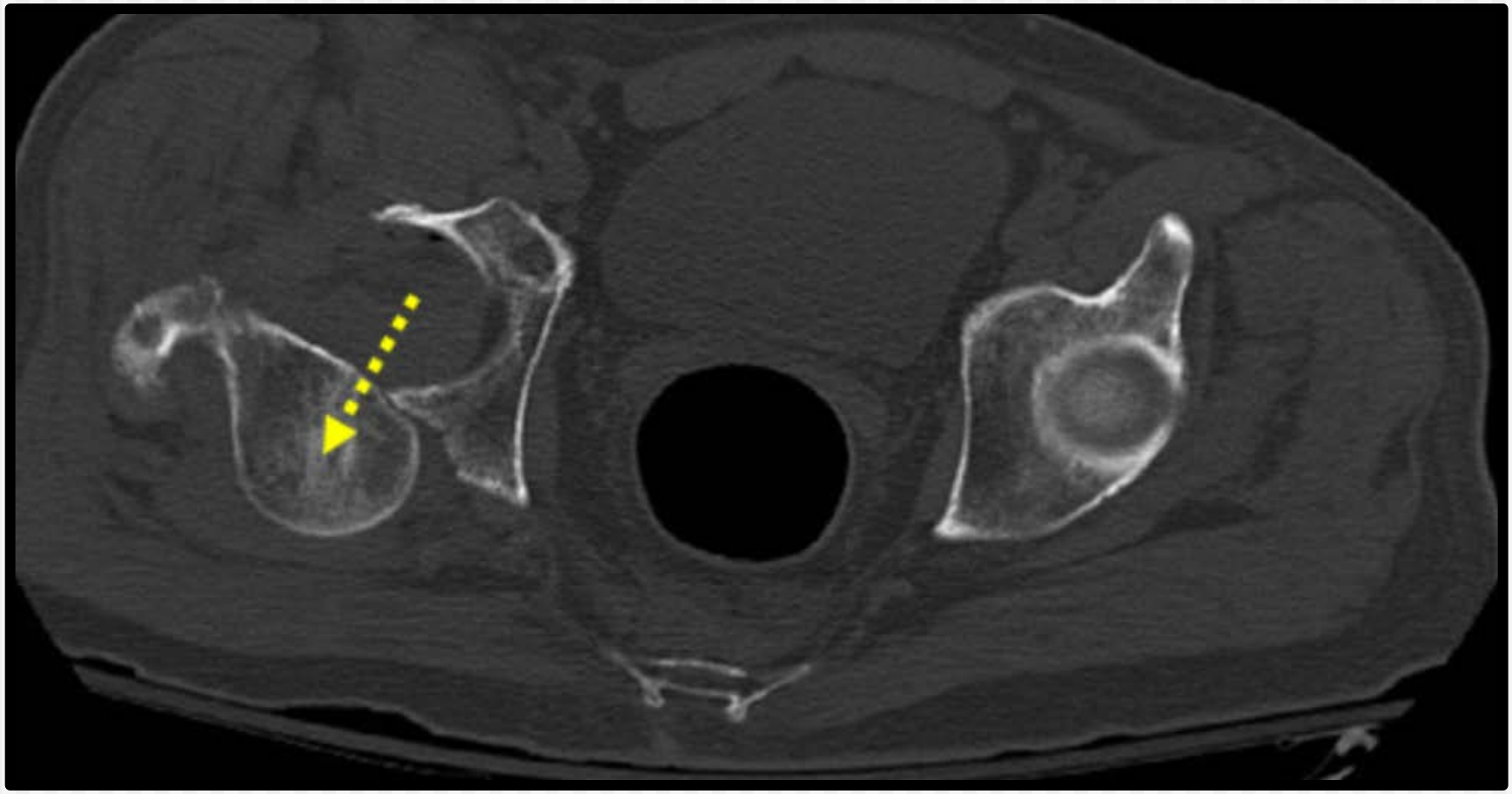
- If orthopedic background or have a comfort level, can try a closed manual reduction (CMR) on the field….often the easiest time to reduce a joint is right after the injury

- If not, splint leg in the position it is in and call an ambulance ASAP!!

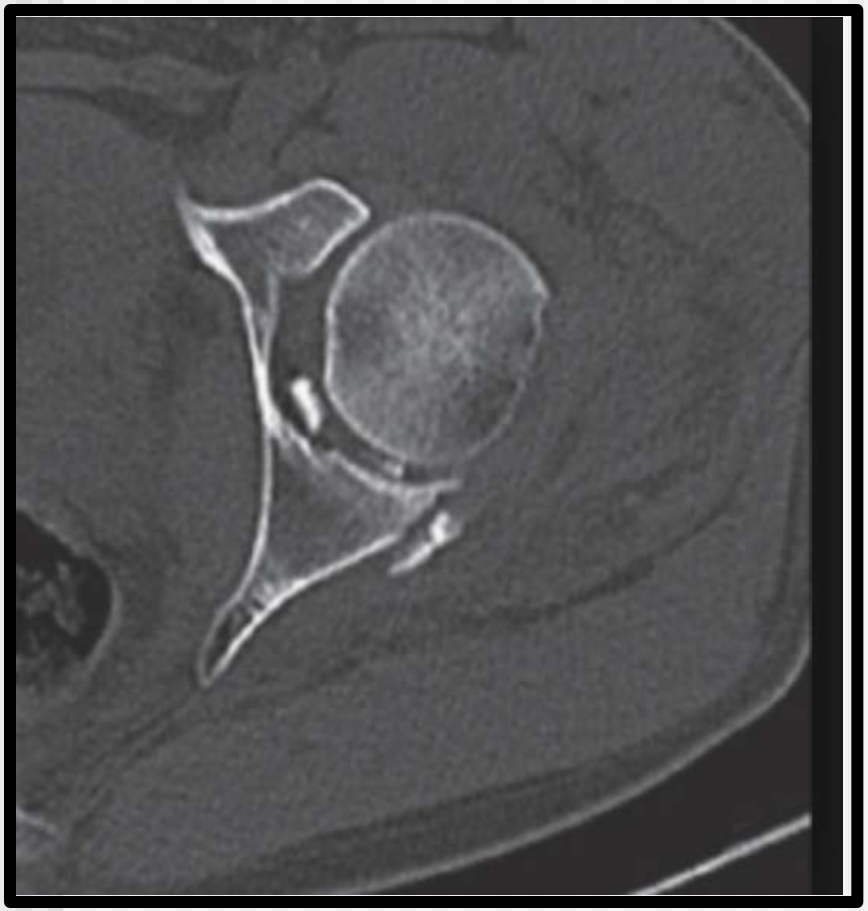
Triage of Hip Dislocation on Field

- They all go to the hospital (reduced or not)
- If it is not reduced on field, it is a TRUE EMERGENCY!!!! If reduced, it is non-emergent
- Need Xray, closed reduction, and post-reduction CT scan (evaluates for loose fragments in joint or fractures)

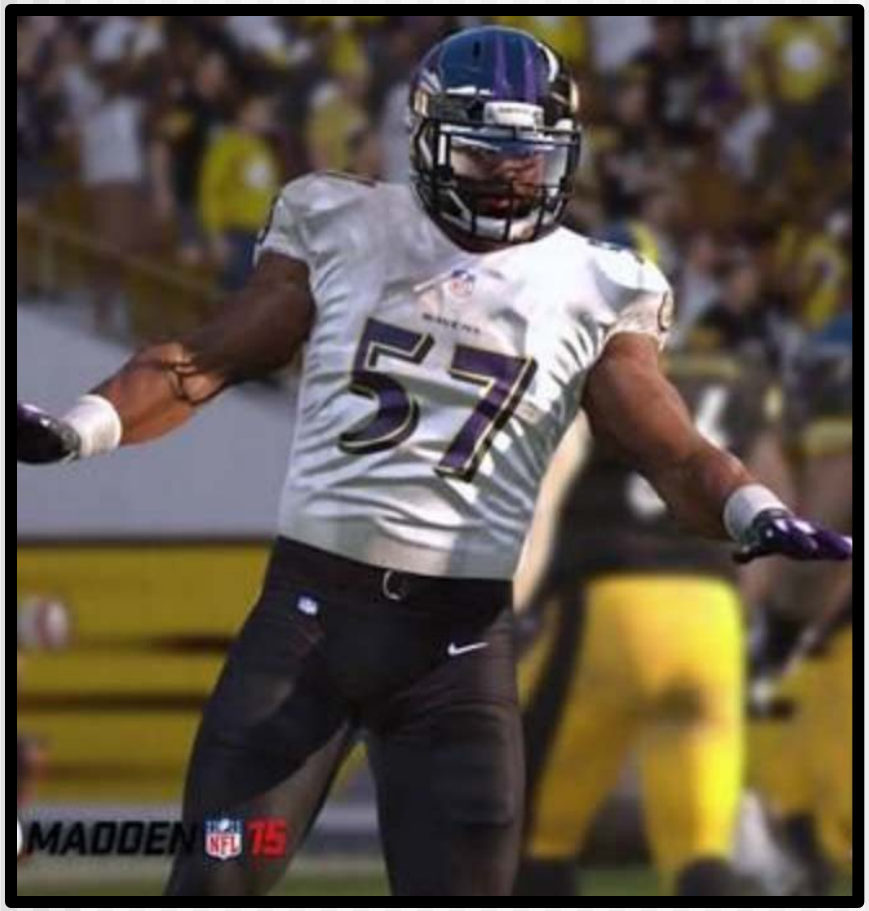
Pre-reduction CT scan



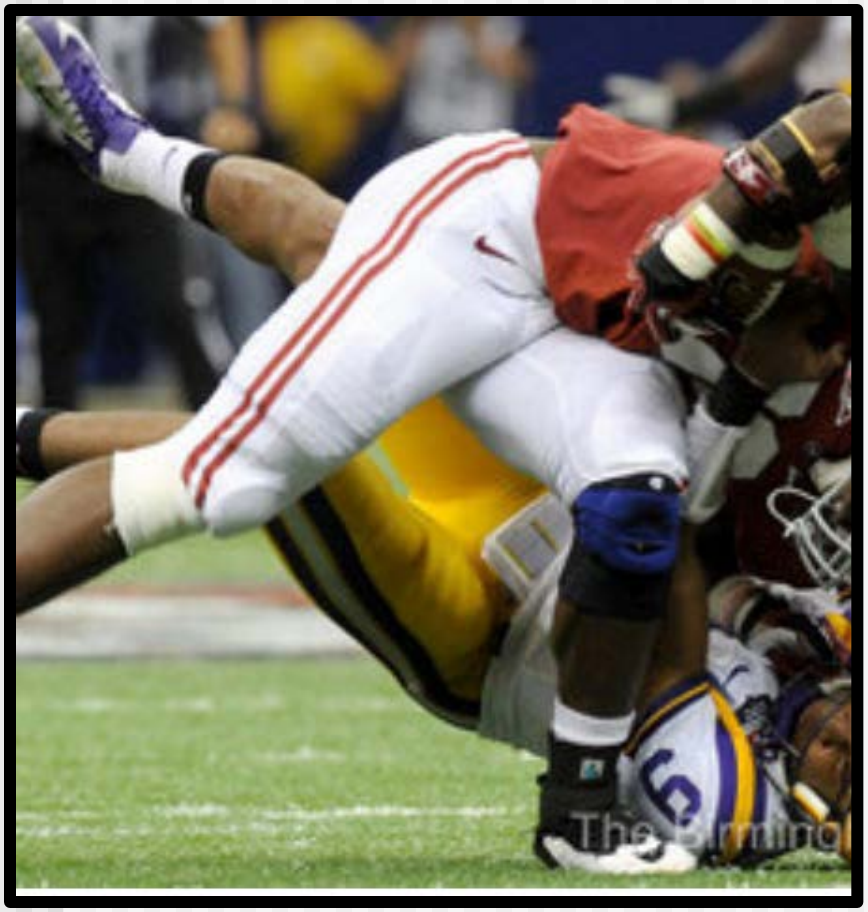
Post-reduction CT scans



Ravens with Hip Dislocations



NCAA BCS Football Championship



NCAA BCS Football Championship

Summary of Hip Dislocations

- Accurate diagnosis on field
- Need neurologic examination
- Attempted closed reduction
  - Not recommended if no orthopedic background
- All go to the hospital by ambulance
- Xrays, CMR, CT scan
- Surgery need depends on concurrent injuries
- Worry about long term AVN

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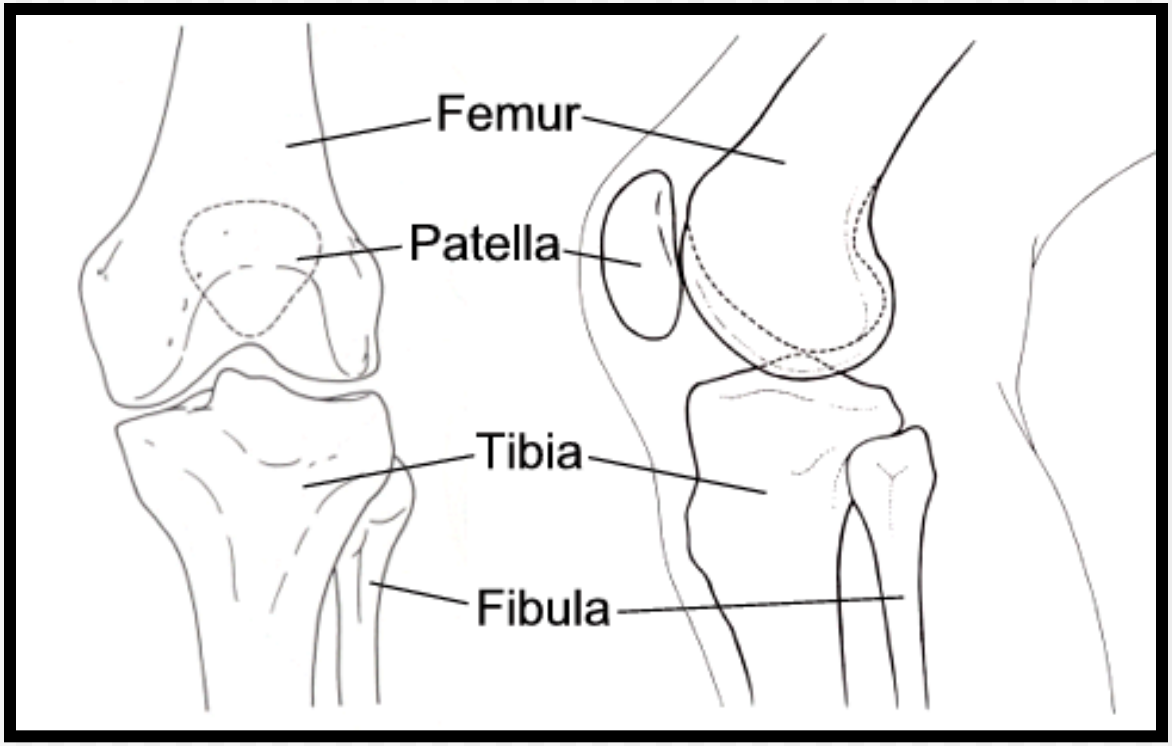
Knee dislocations

- Anatomy
- Types
- Issues
- Management and Triage

Bony Anatomy of the Knee

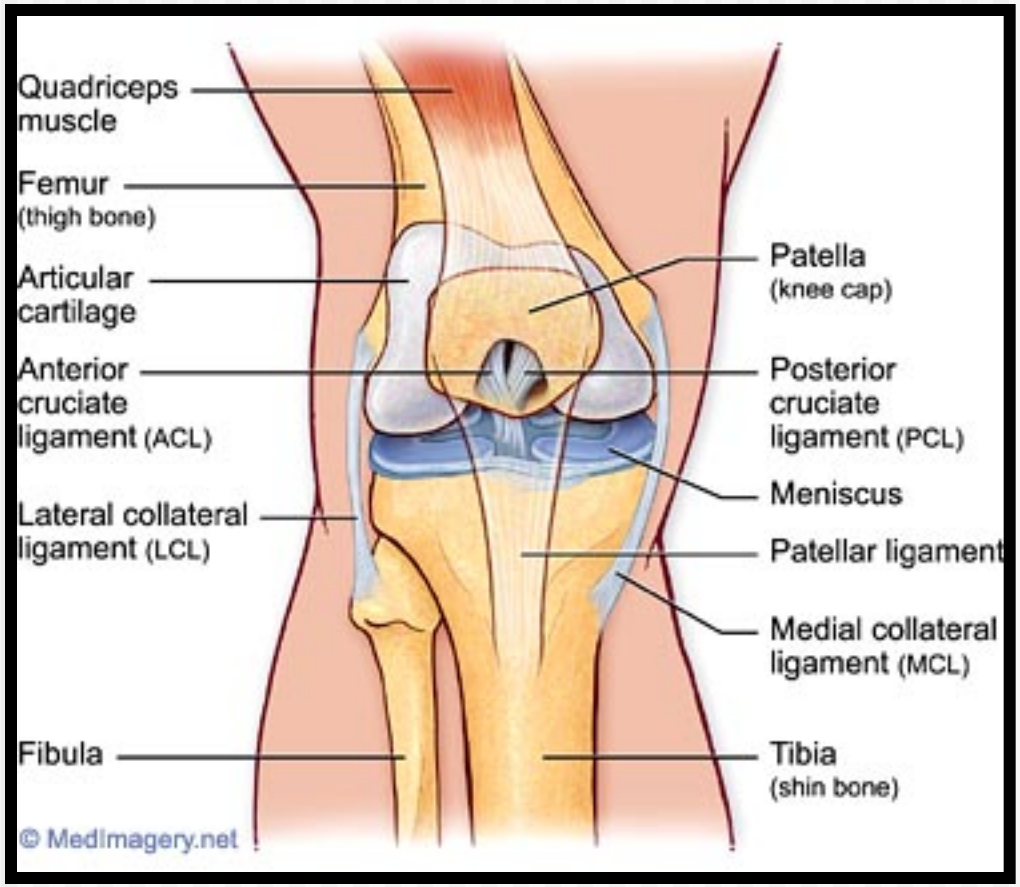
- Femur
- Tibia
- Fibula
- Patella



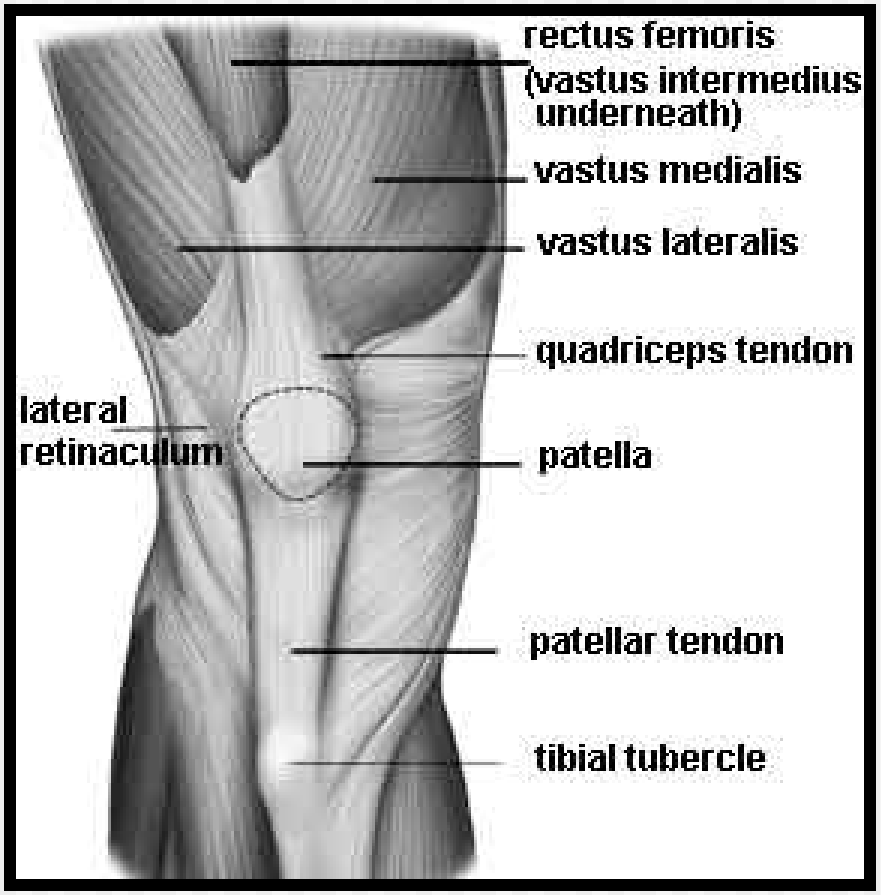
Ligaments and Articulations

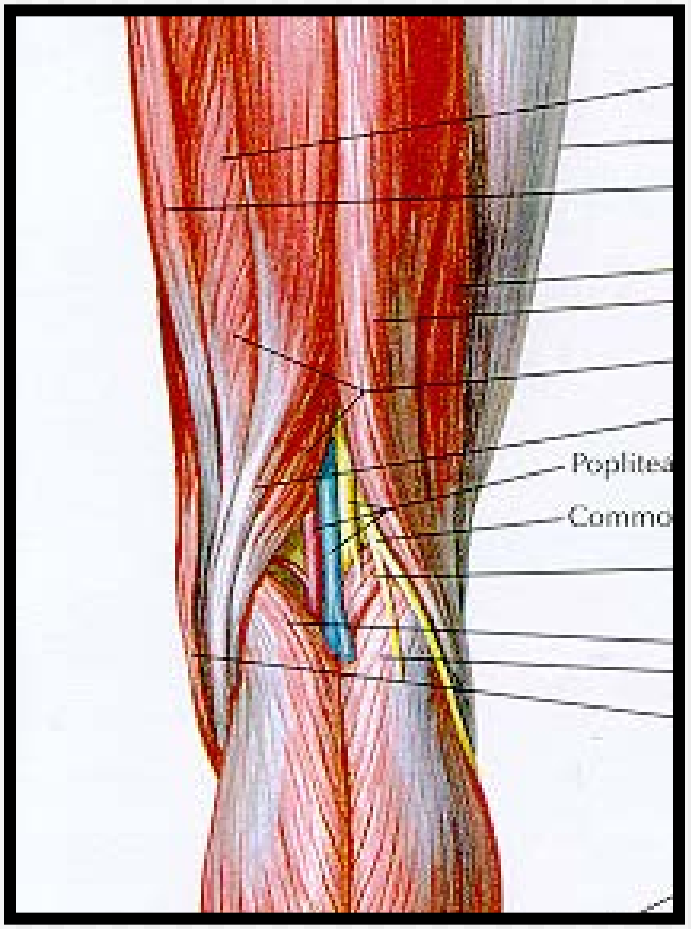
- ACL/PCL
- MCL/LCL

- Tibiofemoral
- Tibiofibular
- Patellofemoral



Muscular anatomy





Types of Knee Dislocations

- Patellofemoral
  - Very common
  - Medial and lateral
  - Lateral much more common (>90%)
- Tibiofemoral
  - Named for direction tibia goes
  - Anterior, posterior, medial, lateral….most are a combination injury

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Patellofemoral dislocation

- Patellofemoral joint is inherently unstable
- Stability conferred by bony conformity, soft tissues, and quadriceps
- Most forces around knee lead to a laterally directed force……lateral dislocations are much more common

Issues with patellar dislocation

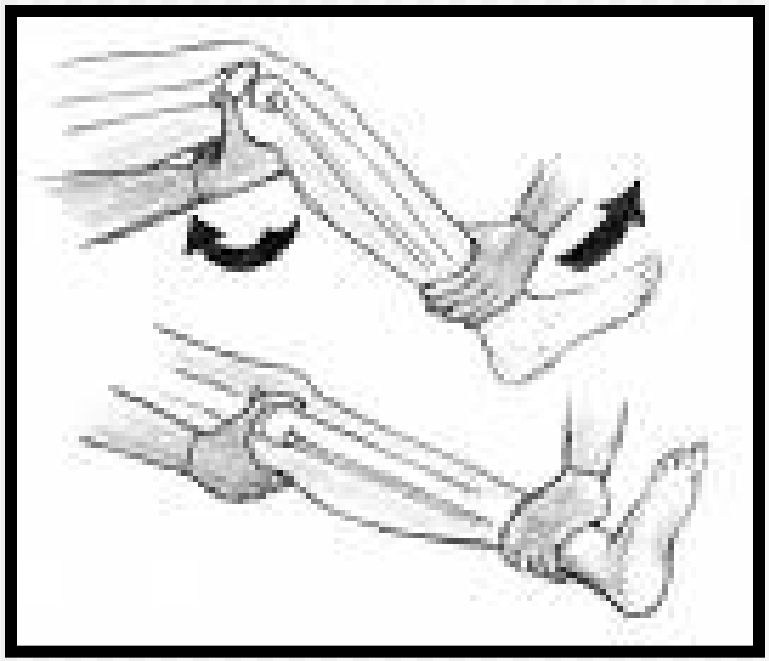
- >90% lateral
- Can be associated with osteochondral fractures and loose bodies
- Associated soft tissue injury (MPFL)
- Knee held in a flexed position with patella along lateral femoral condyle

Lateral Patellofemoral Dislocation

Xray of patellofemoral dislocation

Management of patellar dislocation on the field

- Reduce by placing gentle medial pressure on lateral border of patella while simultaneously extending knee



Management of patellar dislocation on field

- Reduce patellofemoral joint
- Does not return to game
- Apply knee immobilizer/compression/ICE
- WBAT in extension with crutches

Triage of Patellofemoral Dislocation

- Patient may go home with knee immobilizer/crutches (ER not necessary)
- Advise to ice/elevate
- Xray when convenient
- Needs evaluation by orthopedic surgeon
  - MRI
  - Brace and Physical therapy
  - +/- surgery

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Knee dislocation (tibio-femoral)

- Low velocity (athletic) vs high velocity (MVA)
- Can be anterior (30%), posterior (25%), medial, lateral, or rotational--named for tibial position
- Limb threatening injury
- EMERGENCY!!!!

Issues to consider with knee dislocations

- 20-40% knee dislocations will have a vascular injury (popliteal artery) that can lead to limb loss
- 20-40% knee dislocations will have a neurologic injury (peroneal nerve) and many are permanent injuries
- Compartment syndrome is not uncommon

Management of knee dislocations on the field

- Call 911 and get an ambulance if not at game
- Must check distal pulses and neurologic exam PRIOR to any reduction maneuver
- Attempt reduction on field by reproducing the injury (especially if vascular compromise)
  - Anterior dislocation….hyperextension
  - Posterior dislocation…..hyperflexion
- Splint leg whether reduced or not

Triage of knee dislocations

- All go to hospital immediately by ambulance
- Call hospital
- Need immediate reduction, Xrays, orthopedic and vascular evaluations
- Admission to hospital (typical)
  - May need early vascular intervention
  - May need early orthopedic intervention

Prefer to not see these Xrays on your players

Clinical appearance of knee dislocation

Marcus Lattimore knee dislocation

Summary of Knee dislocations

Patellofemoral

- Reduce on field
- RICE
- Knee immobilizer
- Xray when convenient
- Orthopaedic evaluation

Tibiofemoral

- Neurovascular exam
- Call 911
- Reduce on field??
- Splint
- All go to hospital on emergent basis, especially if vascular compromise!!!

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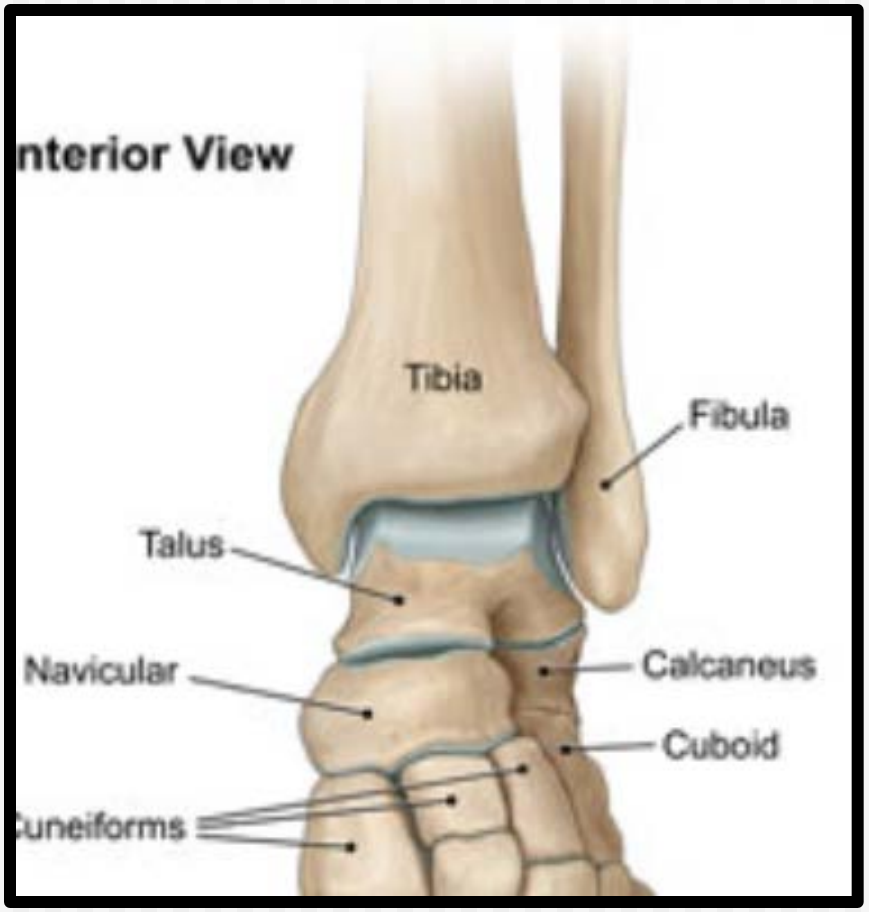
Ankle dislocations

- Anatomy
- Types
- Issues
- Management and Triage

Ankle Anatomy

- Tibia, Talus, Fibula
- Tibiotalar and distal tibiofibular (syndesmosis) joints
- Talus is constrained by the bony architecture of the ankle (ligaments)



Types of Ankle Dislocations

- Named for position of the talus….can be anterior, posterior, medial, lateral, or a combination
- Most common are lateral, posterior, posterolateral
- Usually closed, but can be open injuries

Xrays of ankle dislocations

Normal ankle

Lateral ankle dislocation

Xrays of ankle dislocations

Normal lateral ankle

Posterior ankle dislocation

Issues with ankle dislocations

- Always associated with fractures of ankle
- Medial skin compromise from lateral or posterolateral dislocations
- Rarely associated with neurovascular compromise

Medial skin compromise

Management of ankle dislocations on the field

- If you can achieve better position and alignment of ankle (ie—closed reduction), then do it
  - Minimizes pain for patient
  - Minimizes risk of medial skin compromise
  - Helps to keep swelling down
- Splint on the field
- Ice, elevation

Triage of Ankle Dislocations

- All go to hospital (not local walk-in centers) for Xrays to assure that reduction of ankle is acceptable and for proper splinting
- Need orthopedic follow up for surgery

Clinical appearance

Summary of Ankle Dislocations

- Always associated with fractures of ankle
- Can develop local skin compromise
- Urgent reduction/splint if possible on field
- All go to hospital for Xrays to check reduction
- Will need orthopedic evaluation for surgery

In conclusion…..

- If you can ever reduce a dislocated joint with reasonable safety, do it
  - You will not do any harm to patient, and you may help them substantially
  - Use judgment with knees and hips!!!
- All get splinted on field
- Hips, knees, and ankles go immediately to hospital; Patella can go home
- All require orthopedic doctor follow-up