Musculoskeletal Ultrasound of the Knee
Learning Objectives

- Understand Knee US Exam Considerations
- Recognize the normal and abnormal appearance Knee structures
Knee Anatomy
Anterior Knee Superior

**Multilayer appearance**

1. Superficial – Rectus
2. Intermediate - Vas L&M
3. Deep – Vastus Intermad
Suprapatellar synovial recess

Suprapatellar fat pad

F – femur

P - Patella

Anterior Knee
Anterior Knee Medial and Lateral
Hfp – Hoffas fat pad
Medial Knee Anatomy

- The lateral collateral ligament (LCL) runs on the outside of your knee. It limits sideways motion.
- The anterior cruciate ligament (ACL) connects the femur to the tibia in the center of your knee. It limits rotation and the forward motion of the tibia.
- The posterior cruciate ligament (PCL) also connects the femur and tibia. It limits backward motion of the tibia.
- The articular cartilage lines the bones, cushioning your joint.
- The patella (kneecap) is the largest sesamoid bone in the body.
- The meniscus is cartilage that absorbs shock in your joint.
- Bursa lies below pes anserine.
Medial Knee

- 20-30 deg of flexion
- Meniscofemoral Ligament
- Medial Collateral Ligament
- Can add valgus stress
- Pes Anserine
  - Sartorius, Gracilic, Semitendinosus
Lateral Knee Anatomy
Lateral Knee

- 20-30 deg flexion
- ITBand in long axis
- Between ant and middle third of lateral knee

* Gerdy’s tubercle
Lateral Knee

- Lateral Collateral Ligament
- Popliteal tendon
- Biceps femoris tendon
Posterior Knee Anatomy

Ant. cruciate ligament
Tendon of Popliteus
Lateral meniscus
Fibular collateral ligament
Femur
Lateral Condyle
Medial Condyle
Ligament of Wrisberg
Medial meniscus
Tibial collateral ligament
Tibia
Fibula
Posterior Knee Medial Tendons

* Articular cartilage

- MHG – Medial Head of the gastroc
- Sa – Sartorius
- St – Semitendinosus
- G – Gracilis
- Mfc – Medial Fem Condyle
Posterior Knee

- Lateral Head Gastroc
- Med Head Gastroc
- Popliteal Vein and Artery
Knee US - Clinical Indications

- Cysts - Baker’s
- Tendon tear/tendinosis - Quad and Patellar
- Ligaments - ITB Friction syndrome
- Bursitis - Prepatellar, Pes Anserine
- Bone - Dx of Osgood Schlatter’s disease
- Joint effusion vs synovitis
- Guided needle aspirations/biopsy
- When MRI is contraindicated
Knee – MRI instead of US

- Dx of internal derangement
- Meniscal, Ligament tears
- Osteochondral abnormality
- Bone Marrow edema
- Full assessment of mass lesions
- Synovial pathology
KNEE PATHOLOGY
Med Men Tear – Use Dynamic US
Quad Tendon Tear with effusion

- 45yo female
- Knee swelling
- Weakness climbing stairs
- Acquired in a postop strengthening program
Lateral Knee effusion
Patellar Tendinosis
Medial Gastrocnemius Avulsion
Baker's Cyst
Chronic Posterolateral Knee Pain

- 35yo female
- Chronic post lat knee pain
- Worse going down hill
- S/P Scope and then TKR
Chronic Popliteus Tendinitis

Popliteus tendon calc
Knee Exam - Questions