



### Regional Pain Syndromes: Hip and Knee

Srinivas Nalamachu, MD

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### Disclosures

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### Learning Objectives

- Identify the most common painful conditions in the hip and knee regions
- Review and improve history taking skills and learn about the most useful diagnostic tests that can help diagnose the underlying cause of pain
- Review recent recommendations from professional societies on diagnosis and treatment
- Explain how to improve patient care by incorporating evidence based medicine



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### Hip Joint: Anatomy and Kinesiology

- The hip joint is the joint between the femur and acetabulum and is a major weight bearing joint
- It is a synovial joint and classified as ball and socket joint; offers a greater motion in all directions
- It plays a great role in retaining balance
- The pelvic inclination angle is the single most element of human body posture




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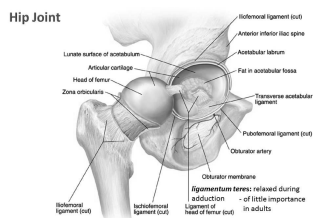
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### Hip Anatomy




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### Hip Joint Movements

- Lateral (external) rotation: 30 degrees in ext, 50 when flexed
- Medial (internal) rotation: 40 degrees
- Extension: 20 degrees
- Flexion: 140 degrees
- Abduction: 50 degrees extended, 80 degrees when flexed
- Adduction: 30 degrees extended, 20 degrees flexed




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### Osteoarthritis of Hip

- Osteoarthritis is a degenerative joint disease that can affect any joint in your body including hips. Over time, due to aging, trauma, or other factors, the cartilage that cushions the joints starts to break down
- The bone-on-bone action causes pain, stiffness, and can limit mobility
- Earliest symptom is morning stiffness followed by pain leading to functional limitations

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### OA Hip (cont'd)

- Diagnosis is primarily by history and physical findings
- Physical findings include tenderness on palpation and Faber's test
- X-rays can confirm the diagnosis and establish the severity of the disease
- No further diagnostic testing is required
- Patients often refer the trochanteric bursitis and sacroiliac joint pain as hip pain, too

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### Faber (Patrick's) test



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### Nonpharmacologic Therapy: Hip Stretches

- Knee pull: Lie on your back and pull your bent knee up toward your chest until you feel a stretch
- Sitting stretch: Sit with the soles of your feet touching each other and your knees apart. Your legs will form a diamond shape. Slowly push your feet up toward your groin to stretch your hips.
- Extended leg balance: This is the same exercise as the knee pull, but from a standing position.

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### Osteonecrosis of Hip

- Osteonecrosis (avascular necrosis) of the hip is a painful condition that occurs when the blood supply to the bone is disrupted. Bone cells die without blood supply, osteonecrosis can ultimately lead to destruction of the joint
- Risk factors include injury, alcoholism, chronic steroid use
- Osteonecrosis is associated with other diseases, including Caisson disease (diver's disease), sickle cell disease, myeloproliferative disorders, Gaucher's disease, systemic lupus erythematosus, Crohn's disease, arterial embolism, thrombosis, and vasculitis
- Treatment usually symptomatic followed by hip replacement

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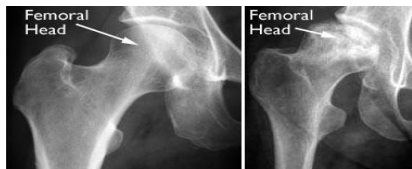
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### Osteonecrosis of Hip (cont'd)



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### Trochanteric Bursitis

- Bursae are small jelly-like sacs located throughout the body. Common joints include shoulder, elbow, hip, knee, and heel. They contain a small amount of fluid and are positioned between bones and soft tissues, acting as cushions to help reduce friction
- Trochanteric bursa covers the greater trochanter of the femur. Inflammation of this bursa is termed “trochanteric bursitis”
- Commonly affects middle aged woman and the pain is on the lateral aspect of thigh. Fairly localized and worse at night



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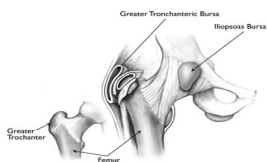
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### Trochanteric Bursitis (cont'd)



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### Trochanteric Bursitis Treatment

- Activity modification
- Exercises to increase strength and flexibility in hip joint
- Topical NSAIDs may offer some pain relief
- Steroid injections offer meaningful pain relief and can last few weeks to few months (40 mg Depo-Medrol combined with local anesthetic)
- Regenerative medicine options



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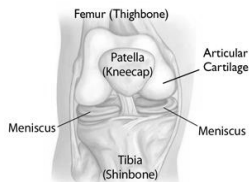
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## Knee Joint

- Largest and strongest joint in the body
- Knee joint consists of an articulation between 4 bones: femur, tibia, fibula, and patella
- 4 ligaments (2 cruciate and 2 collateral)
- Medial and lateral menisci



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## Knee Pain

- Common causes of knee pain include:
  - OA of the knee
  - Chondromalacia patella
  - Ligamentous injuries
  - Meniscal injuries
  - Patellar tendinitis
  - Patellofemoral syndrome
  - Iliotibial band syndrome

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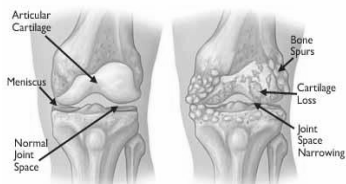
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## OA of Knee



- Pain, swelling, and stiffness are the primary symptoms of arthritis
- Any joint in the body may be affected by the disease, but it is particularly common in the knee

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### Diagnosis of OA (Knee)

- Primarily by history: pain, swelling, and morning stiffness, worse with ambulation
- Physical exam findings include swelling, warmth, and tenderness along with crepitus
- X-rays will confirm the diagnosis and findings include joint space narrowing and bone spurs
- MRI and CT are useful when the soft tissue involvement is suspected

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### Treatment of OA (Knee and Hip)

- Lifestyle modification such as activity limitation and weight loss
- Assistive devices and orthotics (braces) to offload the weight
- PT to improve strength and flexibility
- Change from high impact to low impact activities
- Swimming is useful
- Modalities such as hot and cold

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### Treatment Options

- Modalities such as heat and cold
- Cortisone injections (40mg Depo plus 1-2 cc of local anesthetic). Long term use of steroids can be associated with local and systemic risks including osteonecrosis
  - Hyaluronic acid injections:  
Multiple options, single injection to 5 injections every 6 months. Variability depends on molecular weight and other factors. New data on knee replacement delay. Good safety profile
  - Cryodestruction (focused cold therapy) has limited evidence (infrapatellar branch of saphenous nerve)
  - Stem cell therapy, prolotherapy, platelet rich plasma, umbilical cord fluid, and amniotic fluid all have limited evidence

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### Hyaluronic Acid Injections

- Multiple manufacturers
- Single injection to multiple injections every 6 months
- Avian origin vs bacterial cultures
- AAOS recommendation few years ago led to lack of coverage by some private insurers
- ACR and ACSM recommend is an option
- Some recent data demonstrates knee replacement delayed

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### Patellofemoral Syndrome and Chondromalacia Patellae

- Sometimes synonymously used
- There is consensus that PFS does not have cartilage damage
- Vague pain around the kneecap is reported (circle sign)
- Worse with sitting (movie sign)
- Worse with descending stairs
- Patients report giving away

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### Patellofemoral Syndrome



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### Treatment of PFPS

- Responds well to conservative treatment
- Quadriceps strengthening is the gold standard
- Medications for pain control include APAP and NSAIDs
- Activity reduction may help with pain control
- Applying ice for 10 to 15 minutes will help reduce inflammation
- Taping or bracing have no evidence
- Consensus is to avoid surgery unless all else failed

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### ACL Injuries

- One of the most common knee injuries is ACL sprain or tear
- About half of ACL injuries occur along with damage to other soft tissues. Causes:
  - Gr 1 sprain: mildly damaged, slightly stretched can still keep the joint stable
  - Gr 2 sprain: stretched to the point where becomes loose (partial tear)
  - Gr 3 sprain: ligament is split, joint is unstable (full tear)

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### Causes of ACL Injury

- The anterior cruciate ligament can be injured in several ways:
  - Changing direction rapidly
  - Stopping suddenly
  - Slowing down while running
  - Landing from a jump incorrectly
  - Direct contact or collision (eg, football tackle)
  - Female athletes have a higher incidence

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## ACL Injuries



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## History and Physical Exam

- Injury may be associated with “popping noise”
- Pain with swelling that may subside on its own, unless patient returns to sports which may cause further damage and patient may feel unstable
- Examination should include palpation and signs of instability
- X-rays are not very useful, but MRI is very useful

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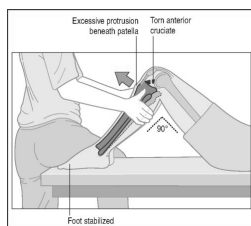
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## Anterior Draw Test



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### Treatment of ACL Injuries

- Treatment will depend on the patient's needs
- Young and athletic patients will need surgical repair
- Conservative treatment may be effective for older patients and the ones who have a very low activity level
- PT to improve strength and functional restoration along with bracing may help




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### Meniscal Injuries

- Menisci tear in different ways and noted by how they look, as well as where the tear is
- Sports-related meniscal tears often occur along with other knee injuries, such as anterior cruciate ligament tears
- Injuries in younger people happen often during sports, direct contact is sometimes involved
- Injuries in older people more likely degenerative in nature
- Often hear a pop with injury, most people can still walk. Gradual stiffness and swelling over 2 to 3 days




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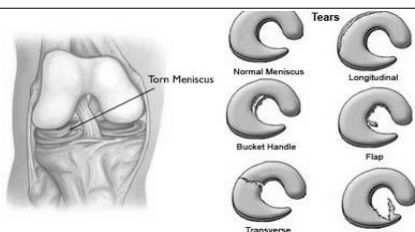
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### Meniscal Injuries (cont'd)



Two wedge-shaped pieces of cartilage act as "shock absorbers" between femur and tibia. They are tough and rubbery to help cushion the joint and keep it stable




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## Meniscal Injuries

### ▪ McMurray test



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## Hx, Physical Exam, and Diagnostics

- Most common symptoms include pain, stiffness, locking, and sensation of "giving way" along with limited range of motion
- Physical exam includes ROM, palpation, and McMurray test
- X-rays will help exclude other diagnosis and MRI is useful of better visualization of soft tissues

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## Treatment of Meniscal Injuries

- Treatment depends on type, size, and location of the injury within meniscus
- Outer 1/3 has better vascular supply and may heal on its own
- Inner 2/3 has poor blood supply and may need to be surgically trimmed
- Age and activity will also play a role in treatment plan

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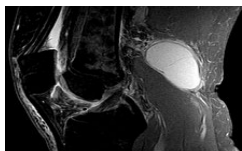
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## Baker's Cyst

- Baker's cyst, (Popliteal cyst)  
Benign swelling of the semimembranosus or more rarely some other synovial bursa found Usually requires no treatment
- treatment for pain
- Rarely symptomatic unless they rupture and cause acute pain, often confused for DVT



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## References

- Osteoarthritis: National Institute of arthritis, musculoskeletal and skin diseases, April 2015
- Osteoarthritis: Care and management in adults (clinical guideline CG177), Feb 2014, commissioned by NICE
- Goldblatt, J.P., LaFrance, R.M., Smith, J.S. (2009). "Managing meniscal injuries: The treatment". *Journal of Musculoskeletal Medicine* 26 (12): 471-477
- Shelbourne KD, Nitz PA (1991). "The O'Donoghue triad revisited. Combined knee injuries involving anterior cruciate and medial collateral ligament tears". *Am J Sports Med* 19(1):19 (5): 474-477.
- Viscosupplementation for the treatment of osteoarthritis of the knee. *Cochrane Database Syst Rev* 2006
- Comparative Effectiveness of Pharmacologic Interventions for Knee Osteoarthritis—A Systematic Review and Network Meta-analysis. *Annals of Internal Medicine* 2015; 162(1):46-55 PMID:25560713
- Efficacy and Safety of Bone Marrow Concentrate for Osteoarthritis of the Hip: Treatment Registry Results for 196 Patients: Christopher Centeno, *Journal of stem cell research and therapy*, 2014, 4:10

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