


Evaluation and Treatment of Knee Arthritis

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Hughton Clinic



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Types of Arthritis:

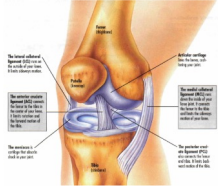
- Rheumatoid Arthritis
- Osteoarthritis
- Crystalline Arthropathies
- Seronegative Arthritis
 - Psoriatic Arthritis
 - AS
 - SLE, etc.

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What does normal look like first....

• Native Knee Anatomy




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Now, what is pathologic....

- Depends on the type of arthritis
- Look at the bone quality
- Joint space?
- Osteophytes present?
- Cysts? Sclerosis?
- What can't you see on a radiograph?
 - Menisci likely degenerative
 - Cruciates may be absent
 - Instability apparent (ALIGNMENT)



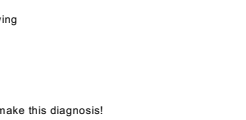
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Osteoarthritis:


- Bone usually sclerotic
- Asymmetric Joint Space narrowing
- Osteophyte Formation
- Subchondral Sclerosis
- Subchondral Cysts

• You don't need all the signs to make this diagnosis!



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Causes of OA:

- Primary/Degenerative "wear and tear"
- Secondary:
 - Trauma
 - Infection
 - AVN
 - Developmental: Perthes/Dysplasia/SCFE

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Rheumatoid Arthritis:

- Bone usually with osteopenia
- Symmetric Joint Space narrowing
- Limited osteophyte Formation
- Limited Subchondral Sclerosis
- Limited Subchondral Cysts



- If there are osteophytes, etc., the patient can still have RA.

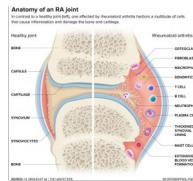
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Rheumatoid Arthritis:

- Bilateral Symmetry
- Periarticular Soft Tissue Swelling
- Uniform Joint Space Loss
- Marginal Erosions
- Juxtaarticular osteoporosis
- Joint Deformity



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Rheumatoid arthritis is a TNF/synovial driven disease:

Destructive effects of TNF

TNF leads to synovial hyperplasia, osteoclast activation, and osteoblast inhibition. Synovial hyperplasia leads to bone erosion. Osteoclast activation leads to joint space narrowing. Osteoblast inhibition leads to cartilage destruction.

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Crystalline Arthropathies:

- Hot swollen joint - mimics septic arthritis
- Gout: negatively birefringent sodium monourate crystals
- Pseudogout: positively birefringent calcium pyrophosphate crystals
 - Meniscal deposition on radiograph
- Diagnosed via aspiration
- You don't need all the signs to make this diagnosis

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Crystals: Viewed Under Polarized Light

Sodium Monourate Crystals Calcium Pyrophosphate Crystals

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Causes of Crystalline Arthropathy:

- Dietary causes: high protein diets
- Urate is the end product of purine metabolism
- As serum urate levels rise, reaches a level where it is NO LONGER soluble in the serum THEN crystallizes in the tissues.
- Hyperuricemia is either OVERproduction or UNDERsecretion

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Gout on x-rays:

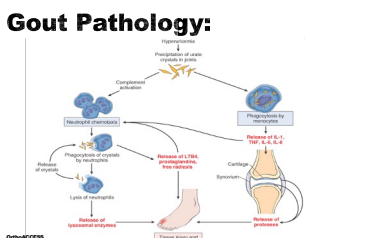
- Common in First MTP joint.



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Gout Pathology:



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 **History taking:
Patient Symptoms**

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Right Knee Pain:


- 58 y.o. gentleman with left knee pain
- Common Complaints:
 - Pain
 - Swelling/Efusions (fluid palpable in joint)
 - Bowing of the leg (deformity)
 - Instability, "It feels like it gives out."
 - Stiffness, doesn't bend like it used to.

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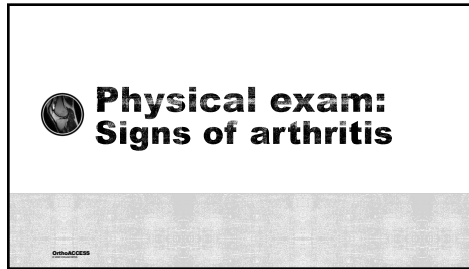
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History Cont.:

- Location of the pain
- Frequency of symptoms
- Intensity of the pain
- Treatment thus far?
 - Meds
 - Injections
 - PT

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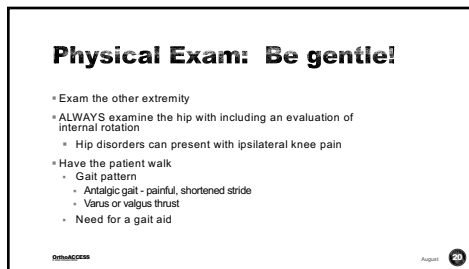
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**Physical exam:
Signs of arthritis**

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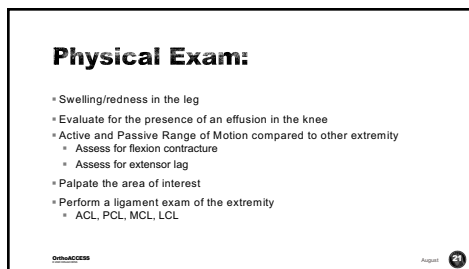


Physical Exam: Be gentle!

- Exam the other extremity
- ALWAYS examine the hip with including an evaluation of internal rotation
 - Hip disorders can present with ipsilateral knee pain
- Have the patient walk
 - Gait pattern
 - Antalgic gait - painful, shortened stride
 - Varus or valgus thrust
 - Need for a gait aid

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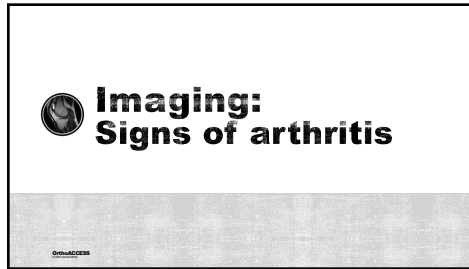


Physical Exam:

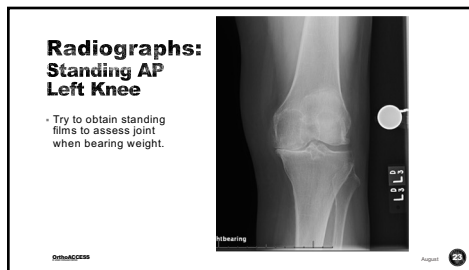
- Swelling/redness in the leg
- Evaluate for the presence of an effusion in the knee
- Active and Passive Range of Motion compared to other extremity
 - Assess for flexion contracture
 - Assess for extensor lag
- Palpate the area of interest
- Perform a ligament exam of the extremity
 - ACL, PCL, MCL, LCL

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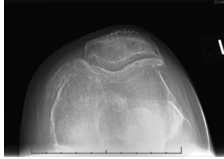


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**Radiographs:
Sunrise View Right
Patellofemoral Joint**



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**Radiographs:
Long Leg Alignment**

- Allows you to assess the weight bearing axis.
- If plumb line falls medial (varus alignment) or lateral (valgus alignment) to the joint it is pathologic.

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**Radiographs:
Long Leg Alignment**




- Allows you to assess the weight bearing axis.
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Radiographs:


- Weight bearing imaging will be listed on the film:
 - By saying, "Weight Bearing" on the film
 - With an arrow pointing up or proximal
 - With a marker that has three BBs.
 - The BBs fall to the bottom of the cup in weight bearing.



Weightbearing Non-weightbearing

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Diagnosis and Treatment

The plan

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Treatment Options:

<p><small>Non-operative</small></p> <ul style="list-style-type: none">• NSAIDs• Physical Therapy• Ice• Activity Modification• Weight Loss• Assist Devices	<p><small>Operative</small></p> <ul style="list-style-type: none">• Arthroscopy for mechanically symptomatic meniscus tear• Osteotomy• Fusion• Partial Arthroplasty• Total Arthroplasty
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Non-Operative Treatment:

- NSAIDs
 - COX 1 vs. COX 2
 - Can irritate the stomach
 - Cannot give with renal disease.

Non-steroidal Anti-inflammatory Drugs - Mechanism of Action

Non-steroidal Anti-inflammatory Drugs (NSAIDs)

Class	Brand Name
Ibuprofen	Advil, Motrin, Ibuprofen
Celecoxib	Celebrex
Etoricoxib	Arcol
Rofecoxib	Vioxx
Valdecoxib	Bextra
Lidocaine	Lidocaine
Chlorzoxazone	Paraflex
Acetaminophen	Tylenol

Source: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2730000/>

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Non-Operative Treatment:

- Physical Therapy:
 - ROM
 - Quad Strength (VMO)
 - Gait Training
 - Balance

Physical Therapy before Knee Surgery?!

Speed up recovery and decrease pain with this essential advice

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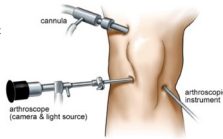
Non-Operative Treatment:

- Use a Gait Aid: Opposite hand for a Cane!

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Operative Options: Knee

- Arthroscopy:
 - Little value for Arthritis treatment
 - Only indicated for mechanical symptoms from a meniscus tear or loose body
 - Locking
 - Catching

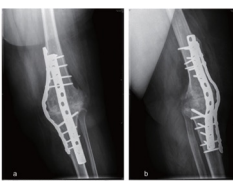


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Operative Options: Fusion

- Bone grows together
- Eases pain in the joint
- Functionally limiting
- Alternative to amputation in infection cases
- Can cause pain in other joints in ipsilateral extremity




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Operative Options: Knee

- Osteotomy:
 - Reserved for younger, active patients
 - Often a stepping-stone to joint replacement
- Distal Femoral:
 - Varus Producing
 - Offloads Lateral Knee
- High Tibial:
 - Valgus Producing
 - Offloads Medial Knee




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Operative Options: Knee

- Arthroplasty (uni vs total):
 - Procedure Selection
 - Location of pain
 - Location of damage (XR)
 - Patient expectations
- Patient Selection
 - Overall health status
 - DM – want good glycoemic control
 - BMI – caution with morbidly obese as risk of complications increases




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Summary

- Variety of types of arthritis: osteoarthritis, post-traumatic, inflammatory
- Understand the key points to a good history and physical
- Radiographs are your best imaging test – should be weight bearing
- Treatment ranges from nonsurgical treatments to surgical treatments including joint replacement



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References for Reading:

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