

## Common Knee & Shoulder Injuries in the Workplace

Factors that Complicate Causation

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## Most Common Injury + Mechanism

- Meniscus Tear – Plant and pivot
- MCL Sprain – Valgus load to knee
- ACL Sprain – Knee Buckles
- PCL Sprain – Direct impact to front of the knee
- Chondral Injury – Rapid deceleration or fall onto knee
- Fractures – Higher impact fall or direct blow
- Quad/Patellar Tendon Tears – Jump/Fall from height

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## History of the Event

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## Careful Consideration

- History
- Mechanism
- Clinical Exam
- X-ray Findings
- Response to Treatments

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## History

- Significant injuries often cause significant pain/discomfort acutely
- Witnessed?
- Reported in a reasonable time frame
  - Sought treatment elsewhere?
- Distracting Injury?
- Migrating and Evolving?
- Occupational Health Evaluation? Consistent Exam?
- Response to treatment?

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## Distracting Injury

- These can certainly occur
  - Underlying injury unnoticed due to severe pain from significant injury (about 6% in multiple trauma)
    - Crush injuries
    - Fractures
    - Burns
  - Mechanism must make sense

J Orthop Trauma, 1991;5(3):308-12.

**Occult orthopaedic trauma in the multiply injured patient.**

Ward WG<sup>1</sup>, Nurliev JA

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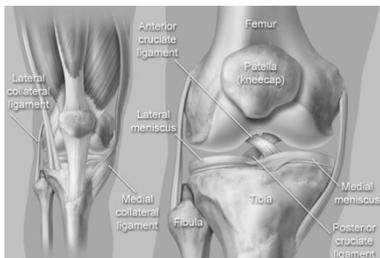
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## Normal Knee Anatomy



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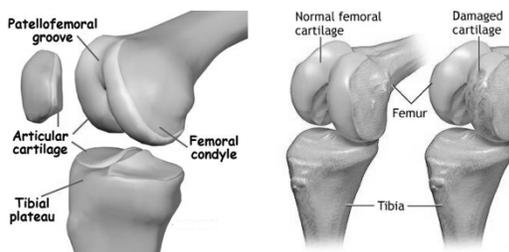
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## Cartilage



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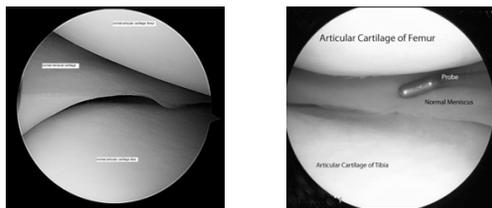
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## View with Arthroscopy



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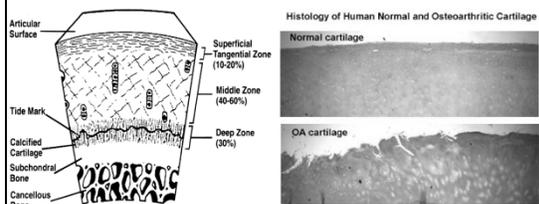
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### Cellular Level



**Arthritis = Loss of Normal Cartilage**

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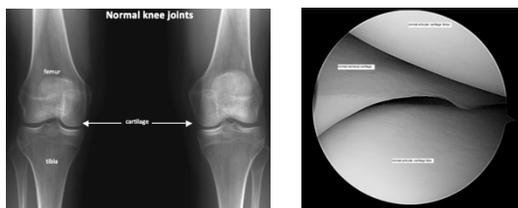
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### How Do We Know?



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### Important to Get Correct Xrays



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### MRI Needed?




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### What Causes Knee Arthrosis

- Osteoarthritis
  - Family History
- Inflammatory Arthritis
  - Rheumatoid – Autoimmune
- Crystalline Arthropathy
  - Gout/Pseudogout
- Post Traumatic
  - Prior Fracture
  - Prior Ligamentous Injury
- Obesity




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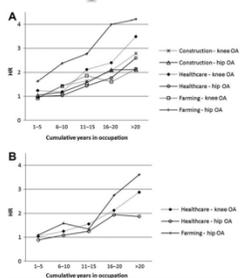
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### Exposure...




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### How can you tell if work is primary cause of arthritis?



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### Can Knee Arthritis Be Asymptomatic?



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### What Causes Symptoms to Develop

- New activity that increases forces in the knee
- Dietary changes
- Can develop spontaneously
- Often wax and wane
- Everyone's pain threshold is different

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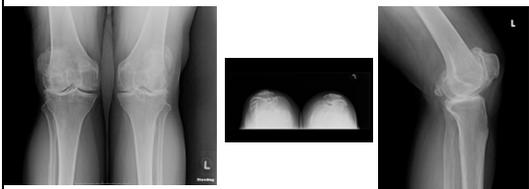
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### Recent Case

- 60 yo female nurse
  - Psych patient scuffle, moved away quickly and developed pain/swelling
  - Has had waxing/waning pain for years, had injections/visco



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### Recent Case

- 48 yo male laborer fell and struck his knee
- No reported issues prior but admits he is not active aside from his job



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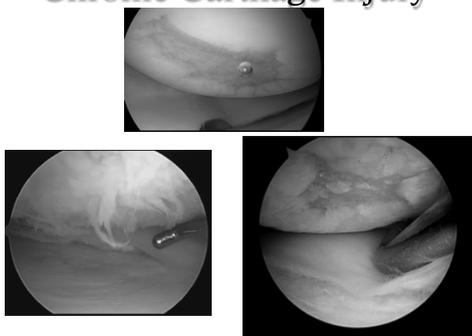
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### Chronic Cartilage Injury



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## Arthritis Treatments

- Rest, Ice, NSAIDs
- Steroid Injection
- Lubricant Injection
- Bracing
- Knee Replacement

Arthroscopy for Arthritis is Futile

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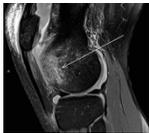
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## Temporary Aggravation of Arthrosis

- Patients with mild to moderate arthritis
- MRI can help determine acute component



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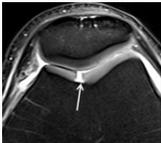
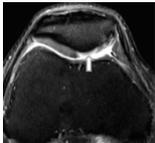
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## Acute Cartilage Injury - Patella

Direct Fall Onto Patella – Defect on Patella or Trochlea



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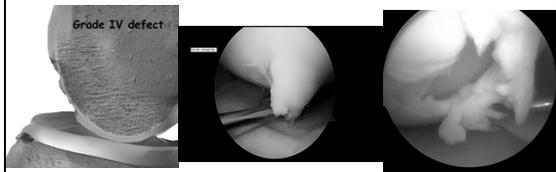
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## Acute Cartilage Injury Condyle

Usually Deceleration

Plant and Pivot

Hard to cause cartilage injury to condyle from a fall



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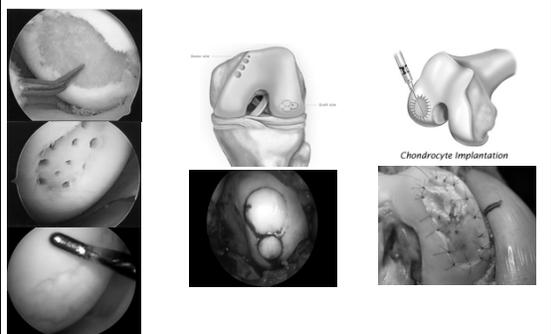
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## Treating Acute Chondral Injury



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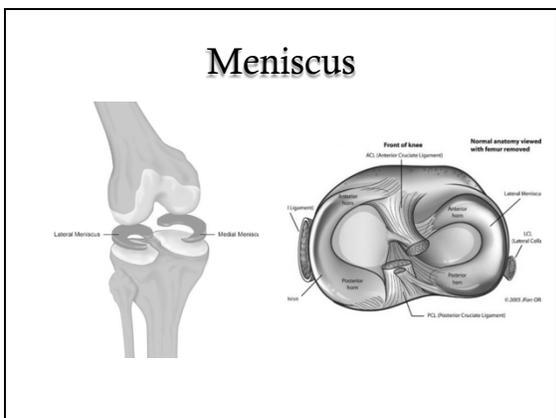
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## Meniscus



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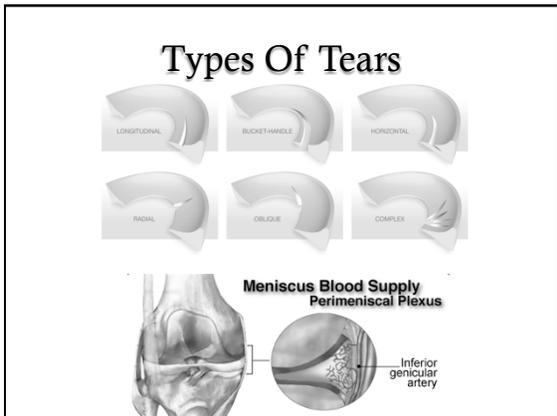
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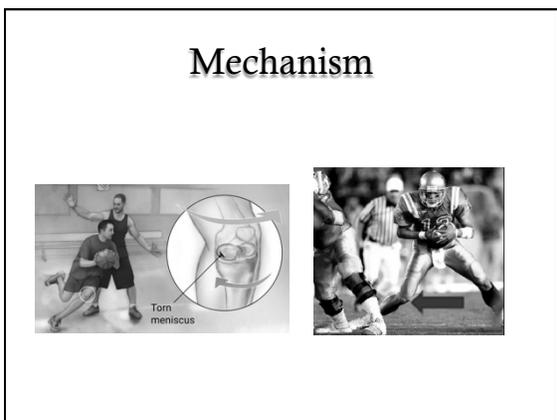
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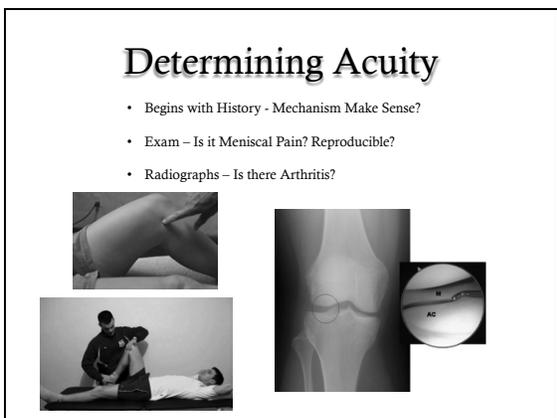
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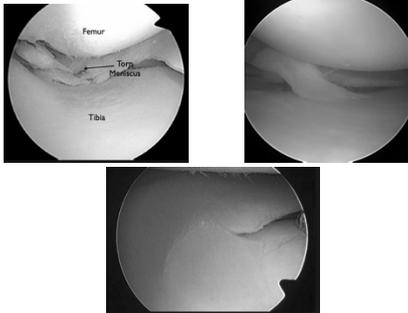
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### Acute Tears



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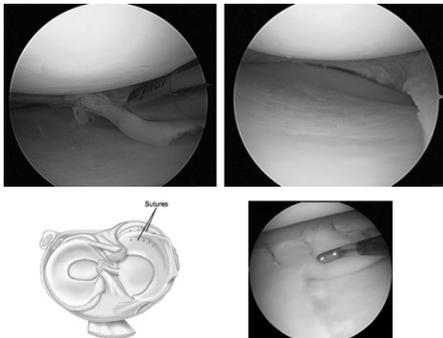
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### Treatment



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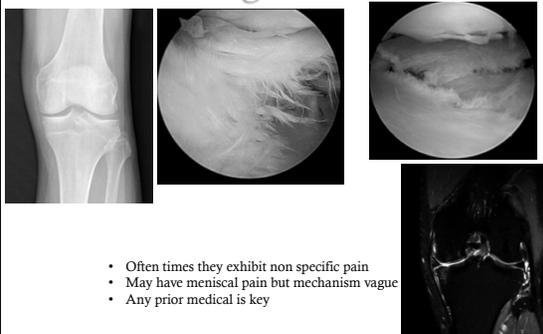
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### Chronic Degenerative Tears



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### MCL Tear



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### ACL Tear



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### History



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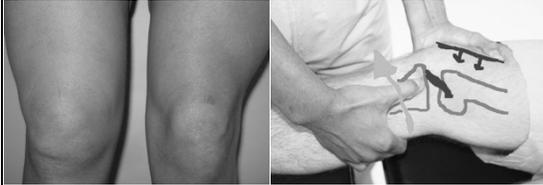
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### Exam



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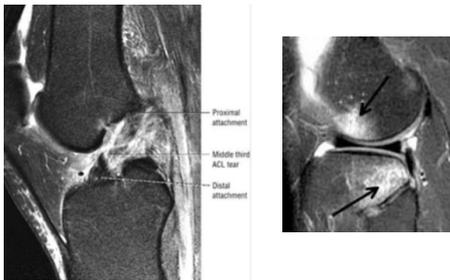
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### Imaging



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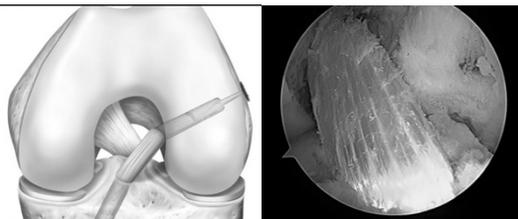
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### Treatment



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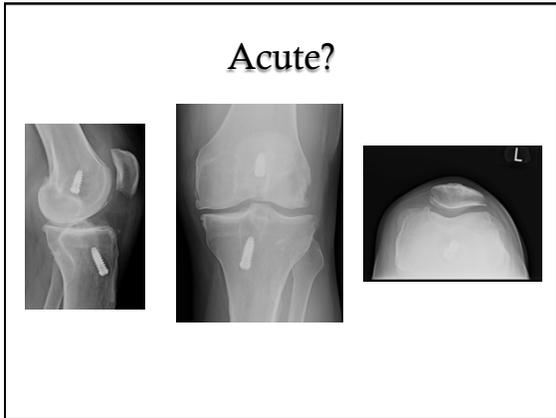
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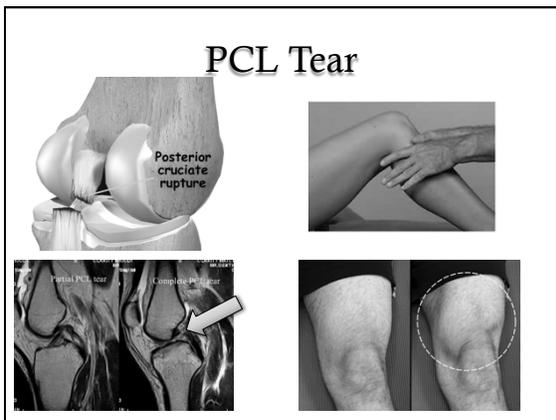
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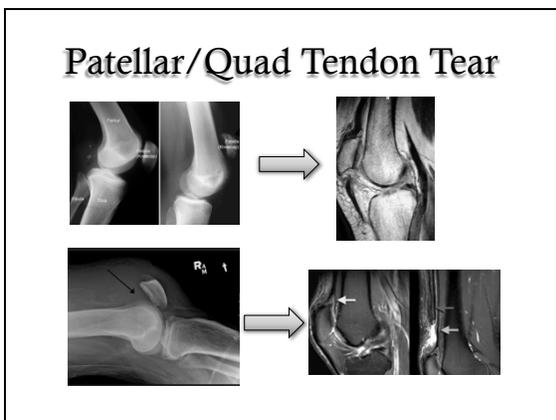
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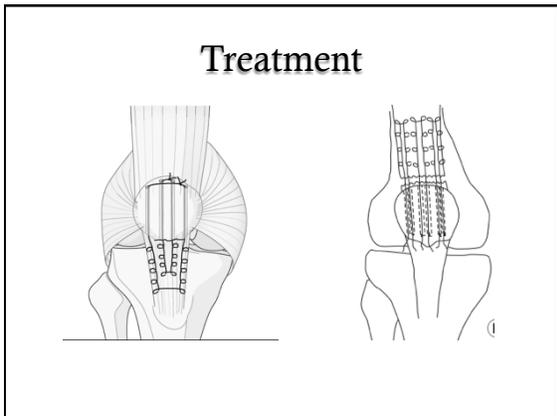
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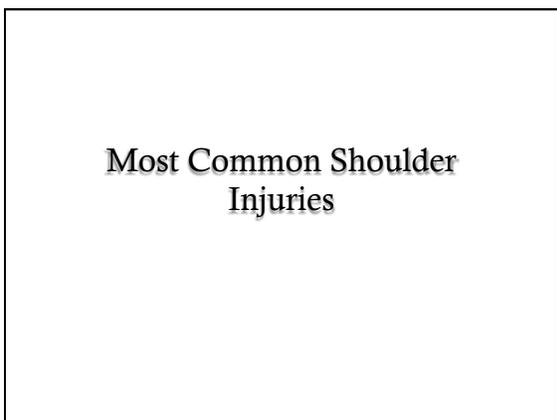
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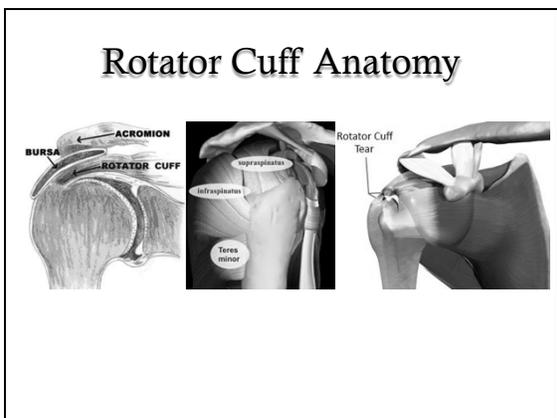
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### Cuff Function



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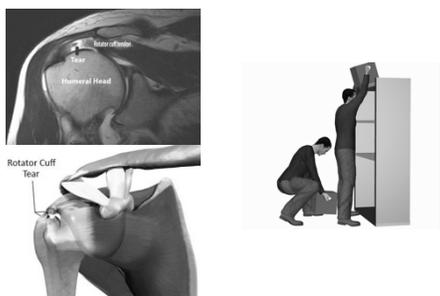
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### Rotator Cuff Tear Mechanism



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### Spectrum of disease

- ⊗ Intrinsic Degeneration of Tendon in Watershed Area
- ⊗ Part of the Aging Process
- ⊗ Incidence of Cuff Tear
  - ⊗ 50-59 y.o. – 13%
  - ⊗ 60-69 y.o. – 20 %
  - ⊗ 70-79 y.o. – 31%
  - ⊗ >80 y.o. – 51%
- ⊗ Why Do Some Tears Hurt and Others Not?

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### Does Xray Help?



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### Does MRI Make Sense?

There Are Many Asymptomatic Cuff Tears!



- How Do We Tell?
  - Acute Tear Pattern
  - Muscle Atrophy
  - Retraction
  - Acute Progression of Chronic Tear
  - Fluid/Edema



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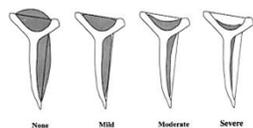
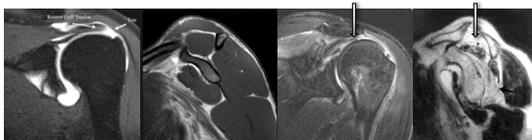
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### Objective Data: MRI



Atrophy →



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### Treatment

Be sure no other source of pain!

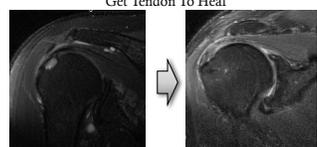
Judicious Use of Diagnostic Injection



AC Joint?  
Biceps?

Get Tendon To Heal

GOAL



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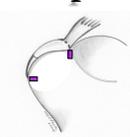
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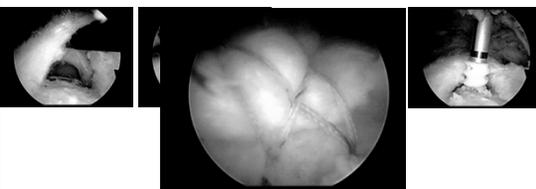
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### Improving Techniques



- All Adhesions
- Increase Strength
- Increase Contact area
- Increase Stability



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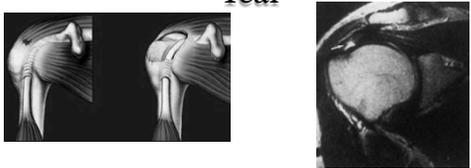
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### Partial Thickness Rotator Cuff Tear



- Spectrum of Rot Cuff Disease: Tendonopathy & Tears
- Abundantly common age > 45 years old
- Mechanism
  - Overhead/Repetitive

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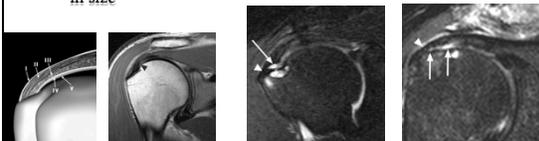
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## Partial Thickness Tears

- Can be pain free then suddenly develop pain at tear increases in size



- My First Line is PT
- If Fails Take Down Intact Rotator Cuff and Repair

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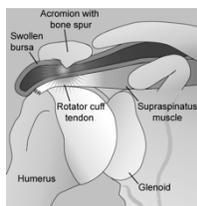
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## Impingement

- Extrinsic Force On Rotator Cuff
- Sustained/Repetitive overhead work



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## Response to Treatment

- Repetitive motion or overuse injuries get worse when doing the activity and get better when the inciting activity is removed

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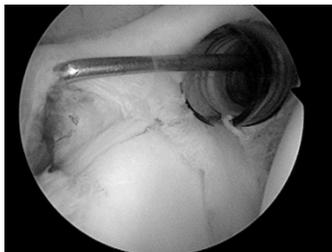
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### Other Factors?

True Cuff  
Tendinosis  
should  
improve with  
therapy and/  
or injection



If it doesn't  
improve  
then likely  
another  
reason

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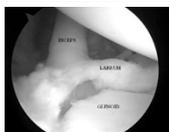
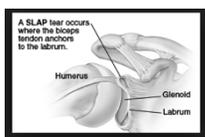
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### SLAP Mechanism



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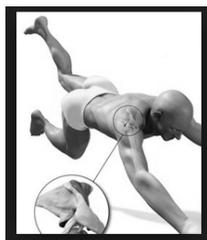
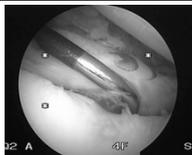
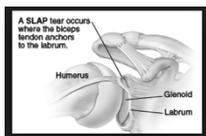
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### Labral Tear Mechanism



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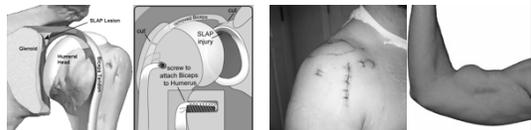
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## Treating the biceps

- Not much difference in Tenotomy (release) vs Tenodesis
  - Cosmetic Deformity
  - Possible subtle loss of peak torque (supination)
- Age >50 : aggressive with treating biceps if Rotator Cuff Tear
  - Biceps is often a source of continued pain after cuff repair



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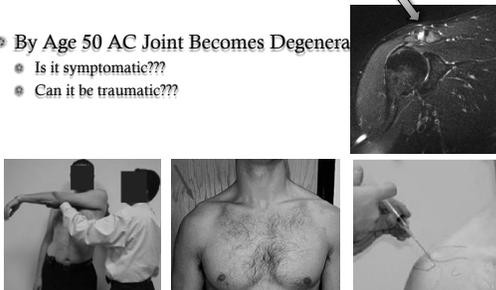
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## AC Joint

- By Age 50 AC Joint Becomes Degenera
  - Is it symptomatic???
  - Can it be traumatic???



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## Distal Clavicle Resection



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