Learning Objectives

- Understand the anatomy of the shoulder
- Identify common diseases and injuries of the shoulder and how they are diagnosed and treated
- Explore recent technologies and procedures to treat diseases and injuries
Anatomy - Bones

- Clavicle
- Coracoid process
- Acromion
- Glenoid cavity
- Scapula
- Humerus
Anatomy - Muscles and Tendons

Extrinsic Shoulder Muscles

Anterior View

Posterior View
Anatomy - Ligaments
Anatomy - Bursae
Torn Labrum

- Generally caused by direct trauma to the shoulder
- Also can develop as degenerative tears from overuse
- Often seen in baseball pitchers and weightlifters
- Leads to shoulder instability
- Type I and Type II tears
- Classified by position on a clock
- SLAP tear, Bankart tear, Reverse Bankart Tear
- 270 degree tear
Diagnosis - Torn Labrum
Diagnosis - Torn Labrum

Symptoms:

- Popping/catching in the shoulder when performing certain movements
- Aching pain/feeling of a “loose” shoulder

Physical Tests:

- O’Brien’s test - arm parallel to ground, thumb up/down, push down
- Crank test - arm abducted to 160 degrees, rotate arm
- Speed test - arm parallel to ground/fully supinated, push down
- Shift test - with arms at side, apply force moving the humeral head anteriorly and posteriorly
- Active compression test - arm across chest, thumb down, push down

Other methods:

- MRI, X-ray, investigative arthroscopy
Treatment - Torn Labrum

**Type I:**
- Ice, physical therapy, anti-inflammatory medication, possibly a corticosteroid injection if pain persists

**Type II:**
- Arthroscopic surgery is recommended to reattach the labrum to the bone
Arthroscopic Surgery

https://www.hss.edu/no-index/animation-SLAP-lesion-repair.htm
Injury - Adhesive Capsulitis (Frozen Shoulder)

- Caused by shoulder immobilization
- Most commonly occurs people who are 40-70 years old
- Most commonly occurs in females
Diagnosis

- Physical exam showing limited movement and pain
- MRI and X-ray to rule out other problems

Treatment

- Non-steroidal anti-inflammatory drugs
- Heat and stretching
- Ice and corticosteroid injections to ease pain and swelling
- Physical therapy
- Surgery:
  - Passive motion surgery
  - Arthroscopic surgery
Injury- Shoulder Impingement

❖ Shoulder impingement- the rubbing of the acromion on the bursa and the Rotator Cuff.
❖ Common in athletes especially swimmers, baseball players, tennis players and middle aged people.
❖ Causes
  ➢ Repetitive overhead lifting or activities
  ➢ Acute minor injury
Diagnosis- Shoulder Impingement

❖ Symptoms
➢ Minor pain with activity and at rest
➢ Pain radiates from front of shoulder to side of the arm
➢ Sudden pain with reaching, lifting, or throwing
❖ If not treated symptoms could worsen
➢ Loss of strength and range of motion
➢ Difficulty doing activities with arm behind the back
❖ Physical Test of range of motion and strength of the shoulder

❖ Medical Imaging
➢ X-Ray
➢ MRI
Treatment- Shoulder Impingement

- Treatment tends to depend on age, activity level, and general health
- Nonsurgical Treatments
  - Rest
  - Non-steroidal Anti-inflammatory Drugs
  - Physical Therapy
  - Steroid Injection
- Surgical Treatments
  - Arthroscopic Surgery
  - Open Surgery
- Rehabilitation
  - Short time in a sling
  - Physical Therapy
- 2-4 month recovery time
Injury - Torn Rotator Cuff

- Most tears of the Supraspinatus tendon, but others can be involved.
- Two types of tears
  - Partial Tear
  - Full Thickness Tear
- Two main causes
  - Acute Tear
  - Degenerative Tear
- Three factors contribute to Degenerative Tears
  - Repetitive Stress
  - Lack of Blood Supply
  - Bone Spurs
- Common in baseball pitchers, tennis players, and people who do repetitive overhead lifting or motions. People over the age of 40 are at the greatest risk.
Diagnosis- Torn Rotator Cuff

- Symptoms
  - Pain while sleeping
  - Pain while lifting/lowering arm
  - Weakness while lifting/lowering arm
  - Clicking sensation when moving shoulder in some positions
- Acute Tear involves intense pain and snapping sensation
- Degenerative Tear involves gradual increase in pain and weakness
- Stability Test
  - Apley's Scratch Test
  - Jobes Supraspinatus Test
Diagnosis- Torn Rotator Cuff

- MRI’s show severity of the tear and the quality of rotator cuff muscles
Treatment - Torn Rotator Cuff

❖ Nonsurgical Treatments
➢ Rest
➢ Non-steroidal anti-inflammatory medications
➢ Physical Therapy
➢ Steroidal Injection

❖ Surgical Treatments
➢ Open Repair
➢ All Arthroscopic Repair
➢ Mini-Open Repair

❖ Rehabilitation
➢ Immobilization
➢ Passive Exercise
➢ Active Exercise

❖ 4-6 months recovery time

https://www.youtube.com/watch?v=a2GXI07YZUk
Shoulder Dislocation

- Tradeoff between mobility and stability
- High recurrence rate
- Caused by falling on shoulder or outstretched arm - contact sports
- Partial dislocation vs. Complete dislocation
- Symptoms: swelling, bruising, weakness, numbness
Diagnosis

Clinical Examination

X-Ray
Treatment

- Immediate
  - External Rotation
  - Stimson Maneuver
  - Milch Maneuver
  - Spaso Technique
- Short-term: Immobilization
- Long-term: Passive ROM exercises to strengthen rotator cuff

Surgery only necessary when condition becomes chronic

http://emedicine.medscape.com/article/109130-technique#c1
Shoulder Separation

- Usually seen in contact athletes, can also happen as a result of falling on shoulder
- Grade 1 - Sprain of AC ligament
- Grade 2 - Torn AC ligament, sprained or slightly torn CC ligament
- Grade 3 - Complete tears of AC and CC ligaments
Diagnosis

- Physical exam, X-rays when necessary
Treatment

- Determined on case-by-case basis
- Short-term: Ice, immobilization, pain medication, anti-inflammatory medication
- Long-term: Physical therapy
Shoulder Fracture

- Can result from fall on shoulder, motor vehicle accident, contact sports, etc.
- Most fractures in children occur in the clavicle bone and for adults in the top part of the humerus
- Three types
  - Clavicle Fractures
  - Scapula Fractures
  - Proximal Humerus Fractures
- Also Classified by how many pieces the shoulder is broken into
  - Ex. 2 pieces, 3 pieces, 4 pieces, etc.
Shoulder Fractures

- Clavicle
- Humerus
- Scapula

Fracture of proximal humerus

Humerus (upper arm bone)
Scapula (shoulder blade)
Ribs

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Scapular blade fracture

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Diagnosis

- Physical examination - swelling, pain over the bone, bruising
- Fractures are diagnosed using x-rays, sometimes a CT scan is needed to look at more detail
Treatment

- **Figure 8 Strap**
  - Worn for 3 to 8 weeks depending on pain
- **Surgery**
  - Place plates and screws or wires and sutures into bone
  - Needed when injury is in the glenoid (shoulder socket) or when broken bone pieces are severely out of place
- **Physical Therapy**
  - To assist in improving motion and strength
- **Pain medication**
New Technologies - Shoulder Replacements

1. Total Shoulder Replacement
   a. Replacing the arthritic joint surfaces with a highly polished metal ball attached to a stem, and a plastic socket
   b. Patients with bone on bone osteoarthritis and intact rotator cuff tendons are generally good candidates for this procedure

2. Reverse Shoulder Replacement
   a. The socket and metal ball are switched → metal ball is attached to the shoulder bone and plastic socket is attached to the upper arm bone
   b. Patients with completely torn rotator cuffs or had previous shoulder replacements that failed are good candidates for this procedure
Standard vs. Reverse Shoulder Replacement

Standard total shoulder replacement

Reverse total shoulder replacement

Total Shoulder Replacement Video

Reverse Total Shoulder Replacement Video
any questions?