

Massive Rotator Cuff Tears

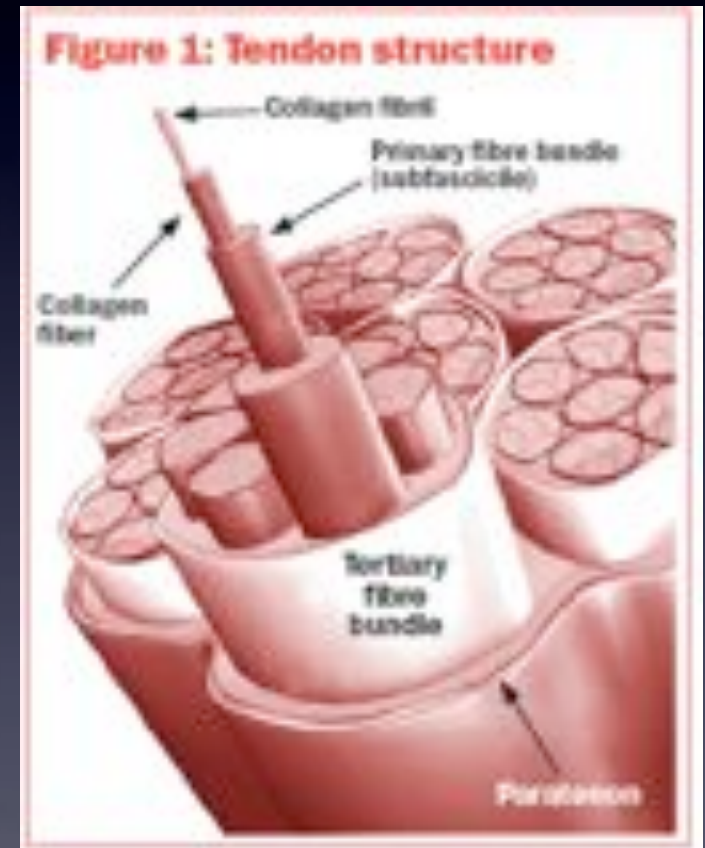
Pathophysiology and Treatment Options

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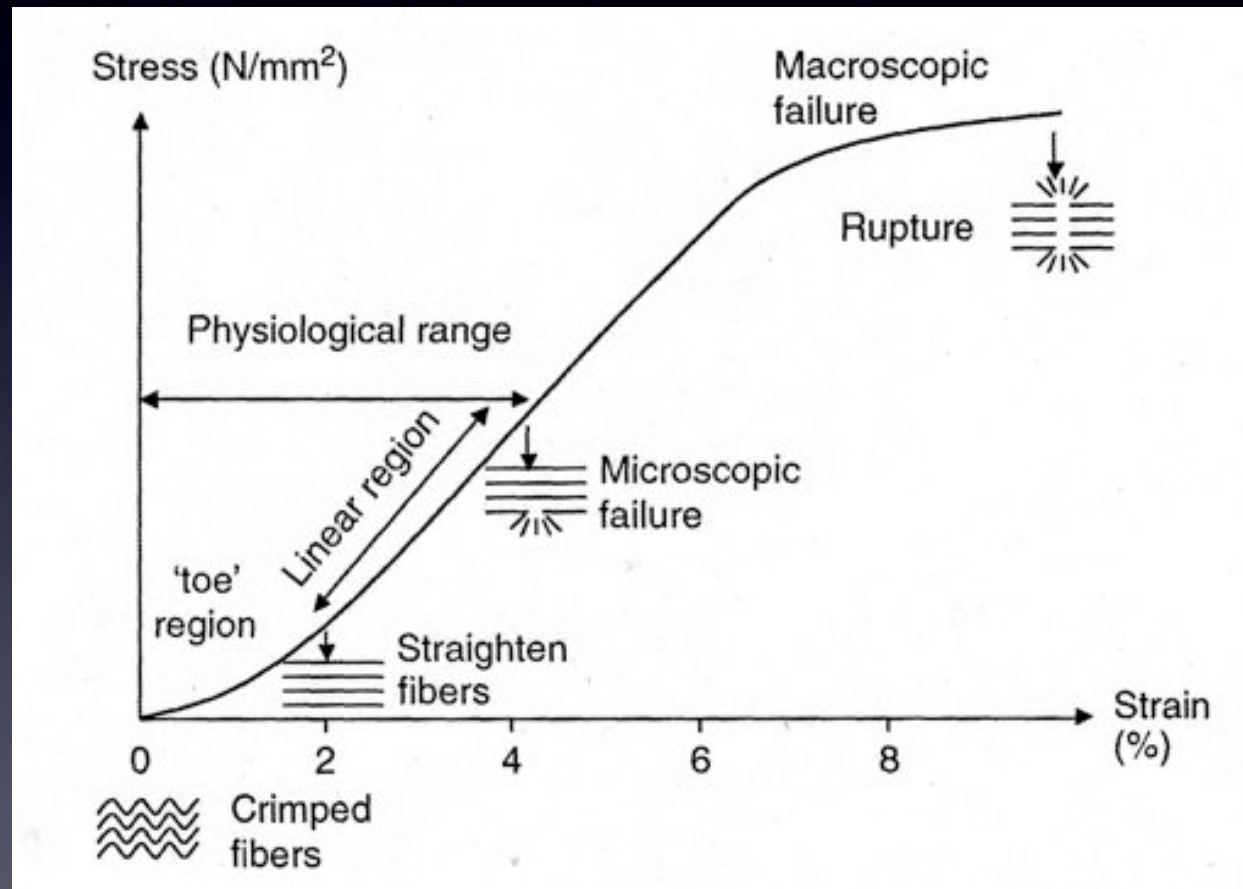


Tendon Structure

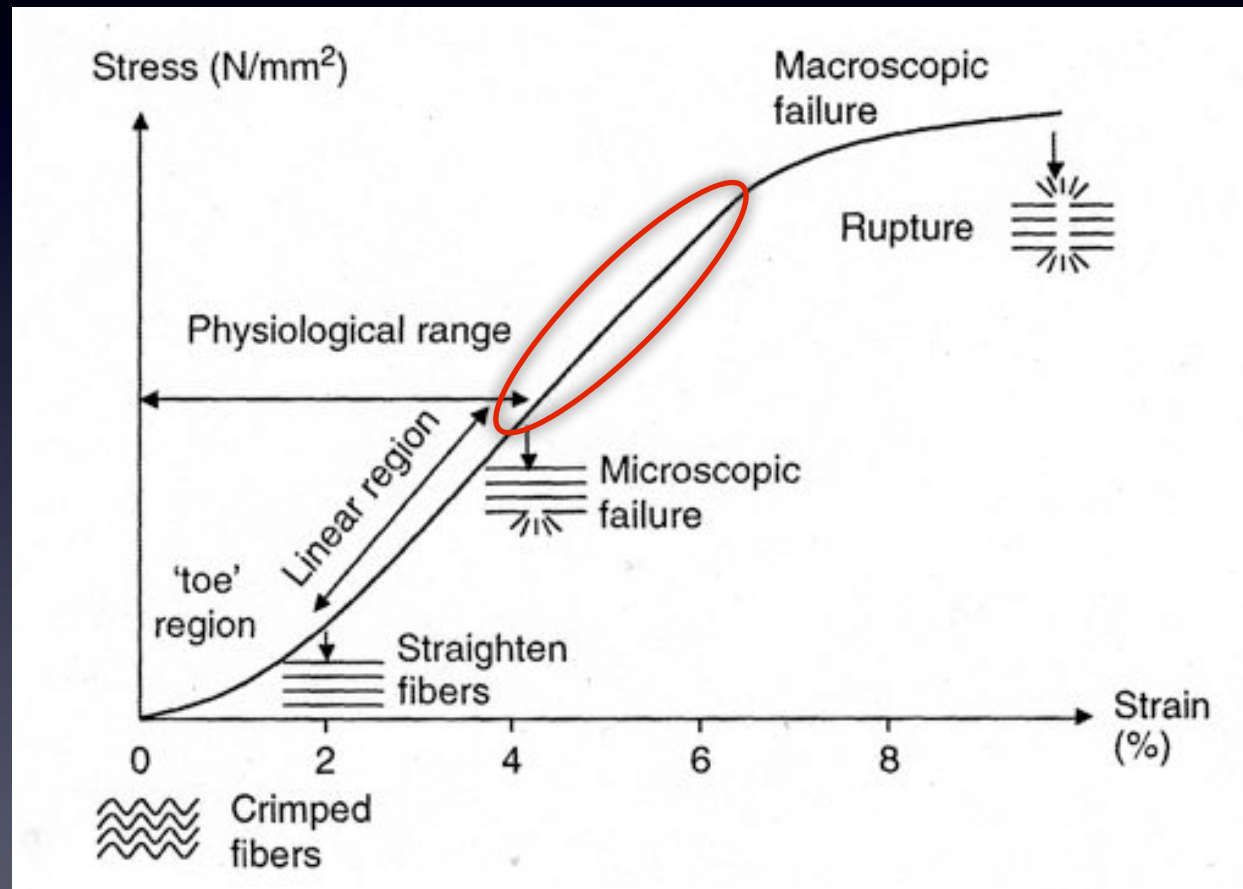
- Tendons are mechanically responsible for the transmission of muscle forces to bone
- Enthesis has four distinct zones; tendon, fibrocartilage, mineralised fibrocartilage (Sharpey's fibres) and bone.
- Enthesis is subjected to tensile, compressive and shear forces, which may be four times the force of that at the muscle mid-substance



Tendon Injury



Tendon Injury



Tendon Overuse

- Small repetitive strains lead to microinjuries
- Prostaglandins and Leukotrienes released
- PGE2 induces profound degenerative change when injected into tendon mid-substance
- LTB4 induces tendon oedema

Tendinopathy

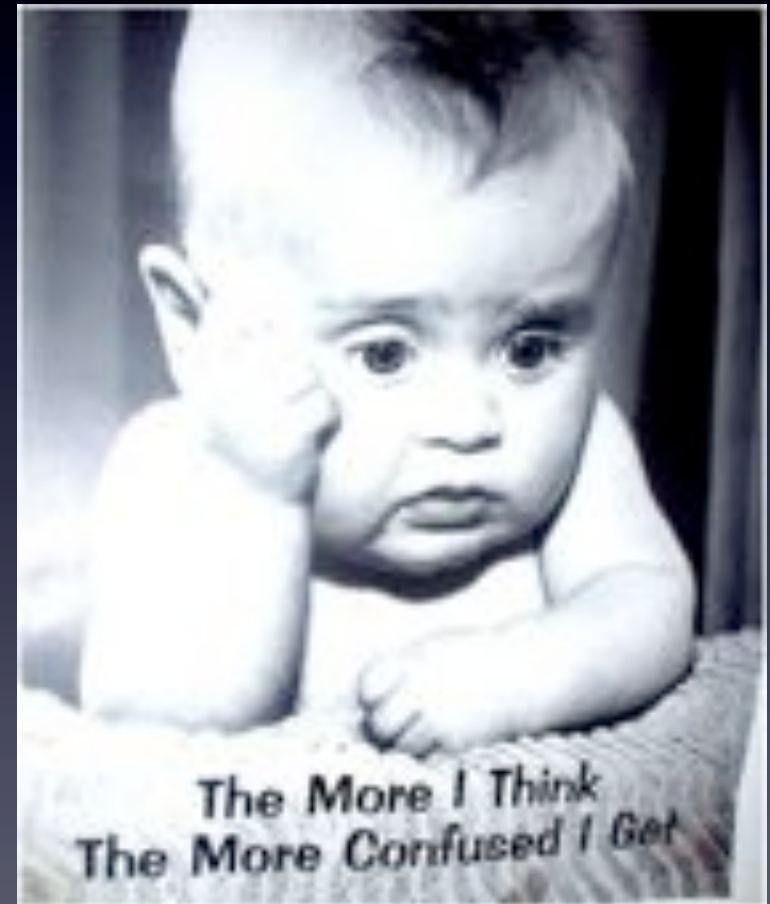
- Lack of inflammatory cells in Chronic Tendinopathy

Tendinopathy

- Inflammation occurs in the early stages of tendinopathy
- Disappears once the degenerative process has begun
- ? Explanation for frequent lack of pain

Tendinopathy

- **Mechanotransduction**
 - Molecular and genetic level
- Complex cascade of extracellular matrix gene expression and protein synthesis

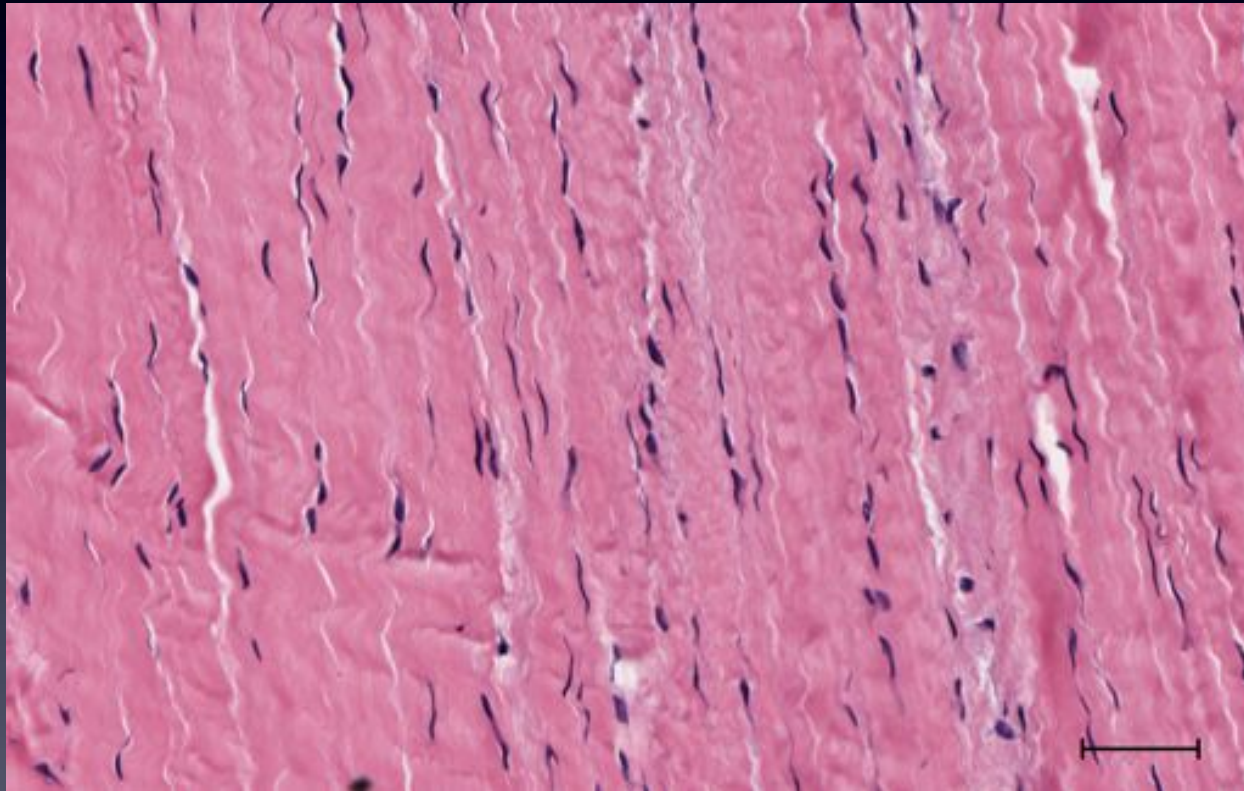


Tendinopathy

- Careful **balance** of these pathways
- appropriate positive change in tendon as a result of physical training
- negative degenerative changes



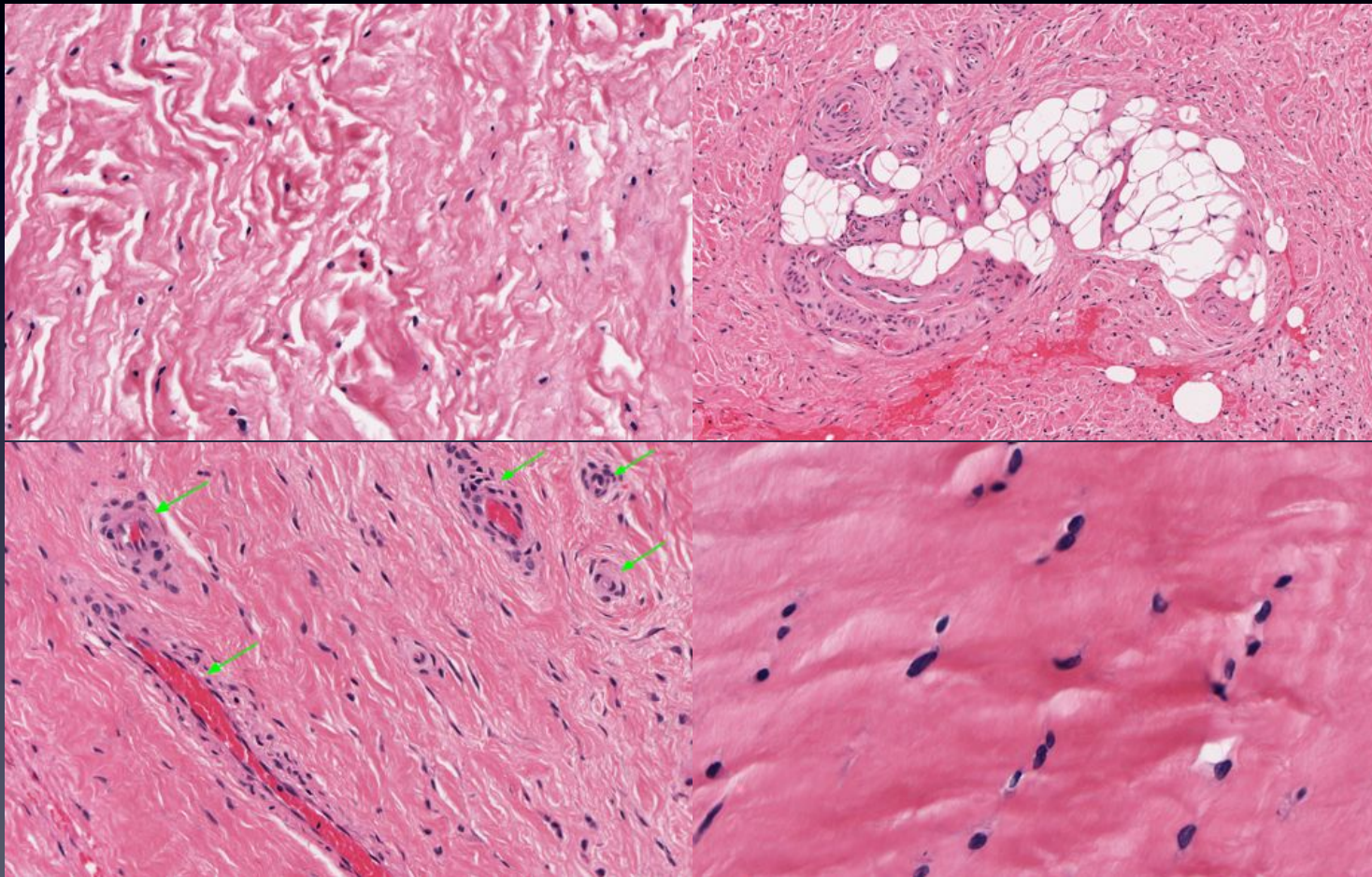
Normal Tendon



Tendinopathy

- **Angiofibroblastic Hyperplasia (Nirchl, 1979)**
 - (i) increased cellular numbers
 - (ii) neovascularisation
 - (iii) increased neurochemicals
 - (iv) disordered collagen matrix
- **Tenocyte Apoptosis (programmed cell death)**

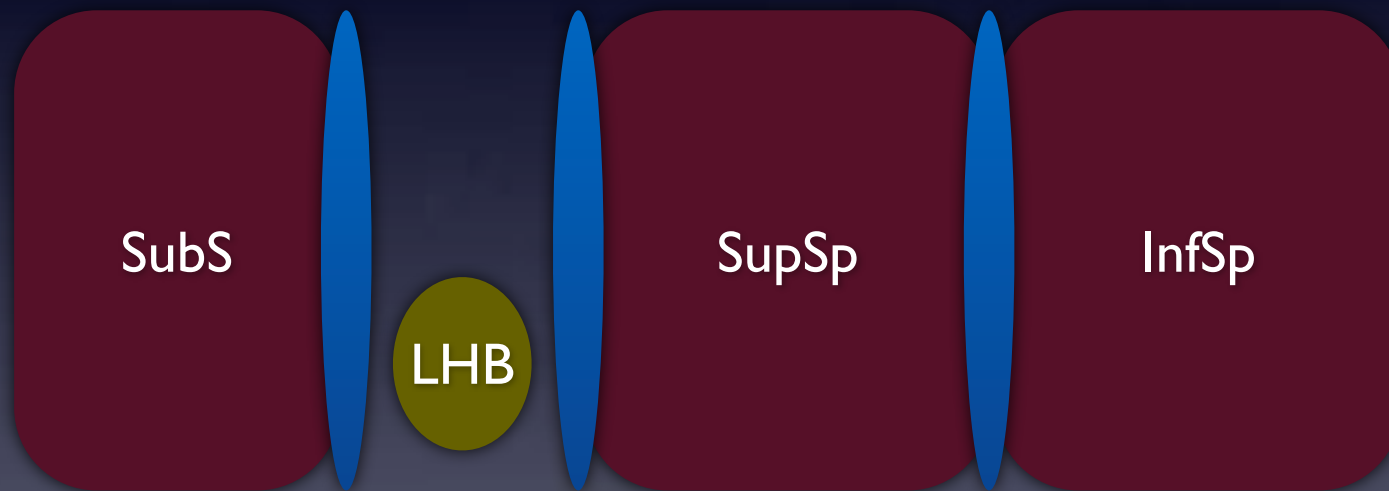
Tendinopathy



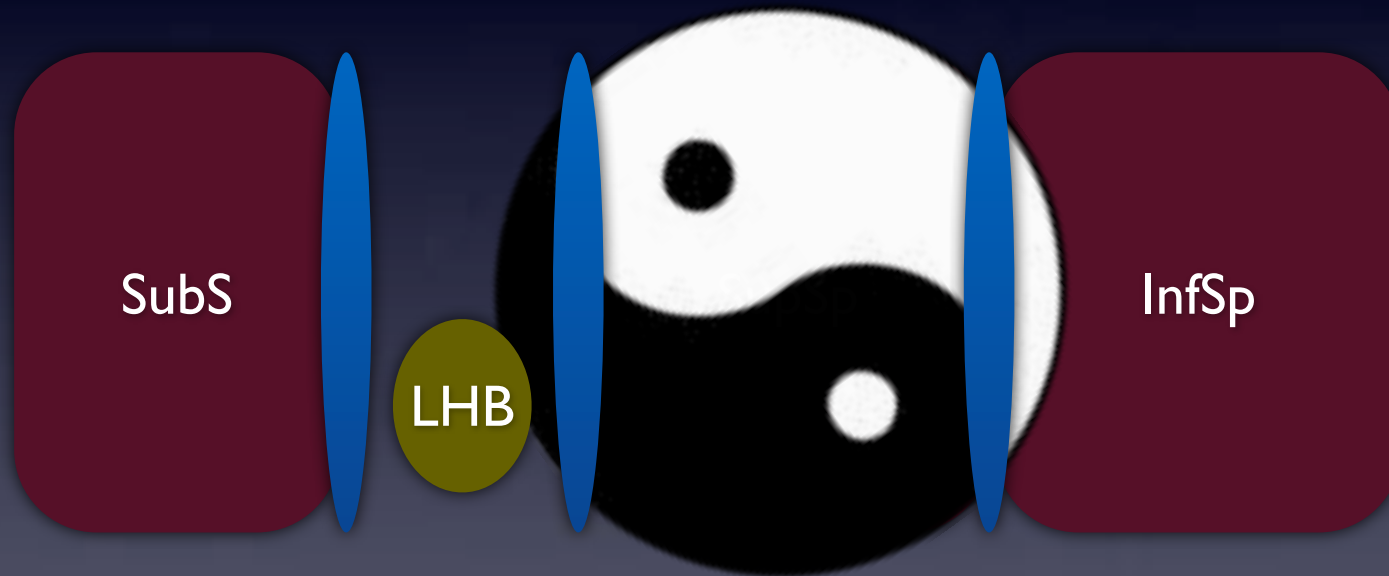
Rotator Cuff Tears

- A Brief History
 - Codman - Rim Rent of Supraspinatus
 - Critical area of Hypovascularity
 - Neer - External Impingement

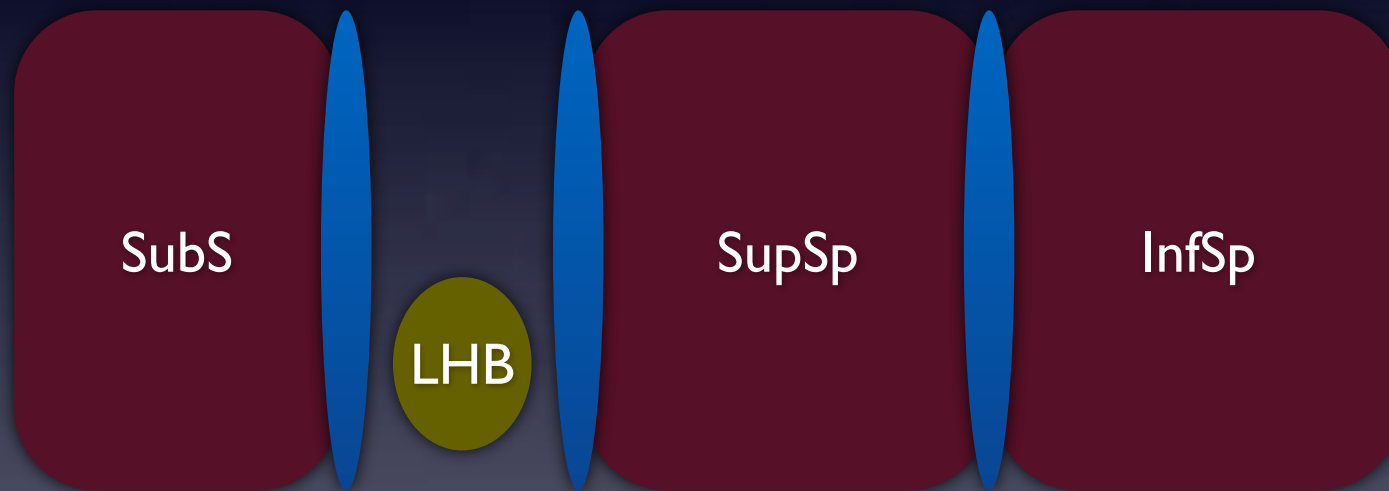
Cuff EndoSkeleton



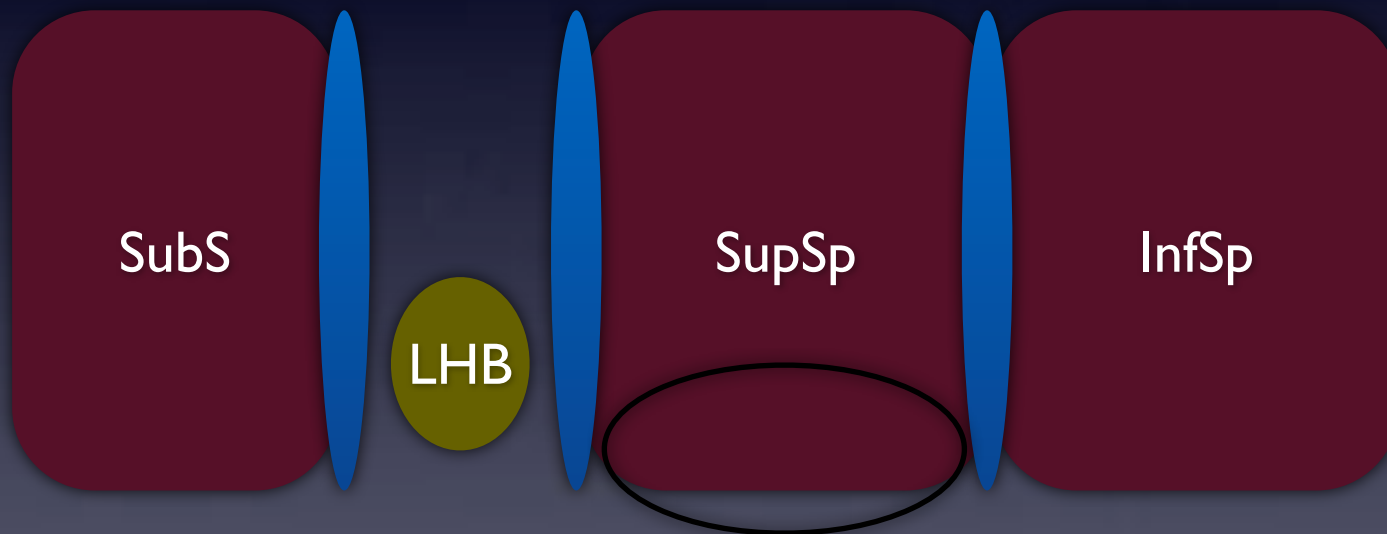
Cuff EndoSkeleton



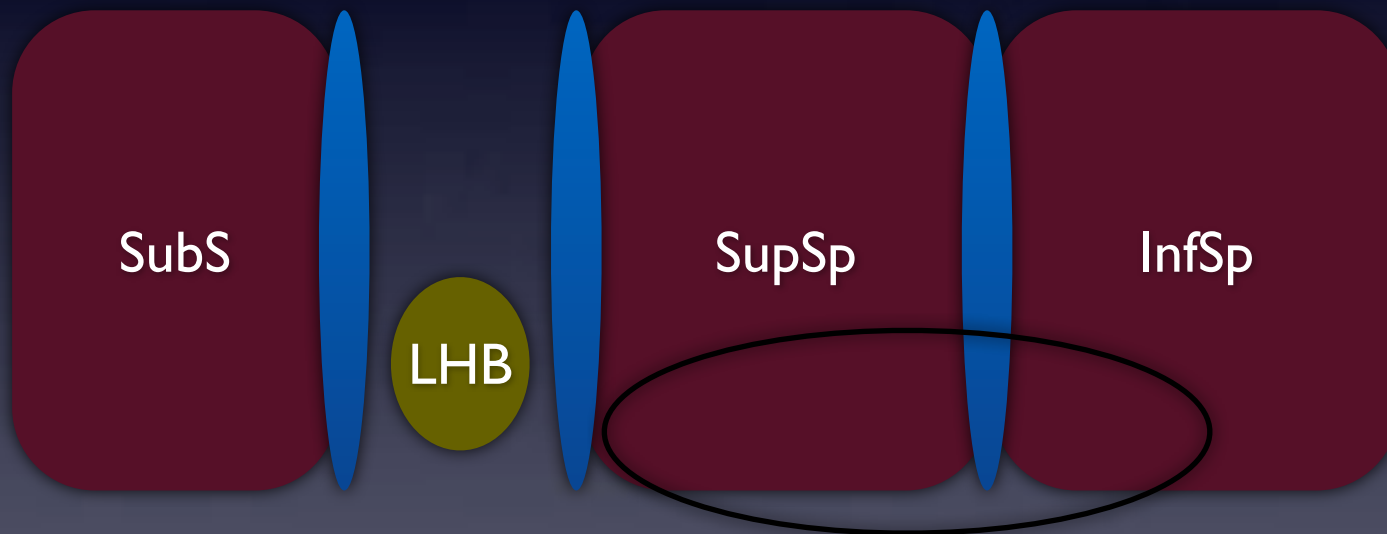
Cuff EndoSkeleton



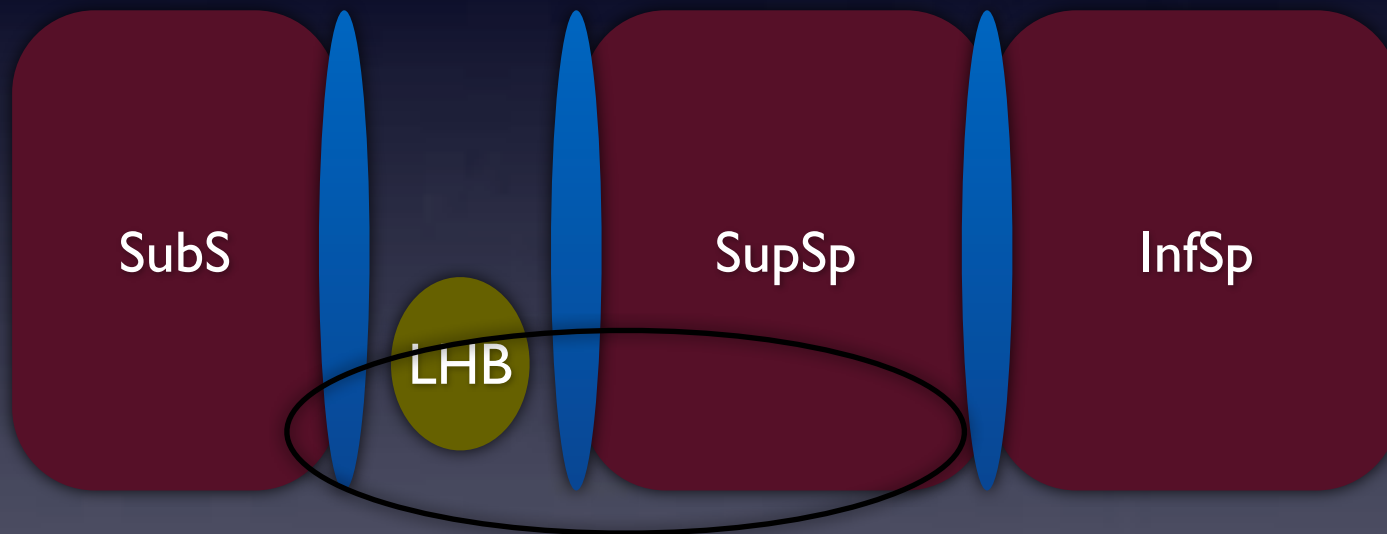
Cresent Tear



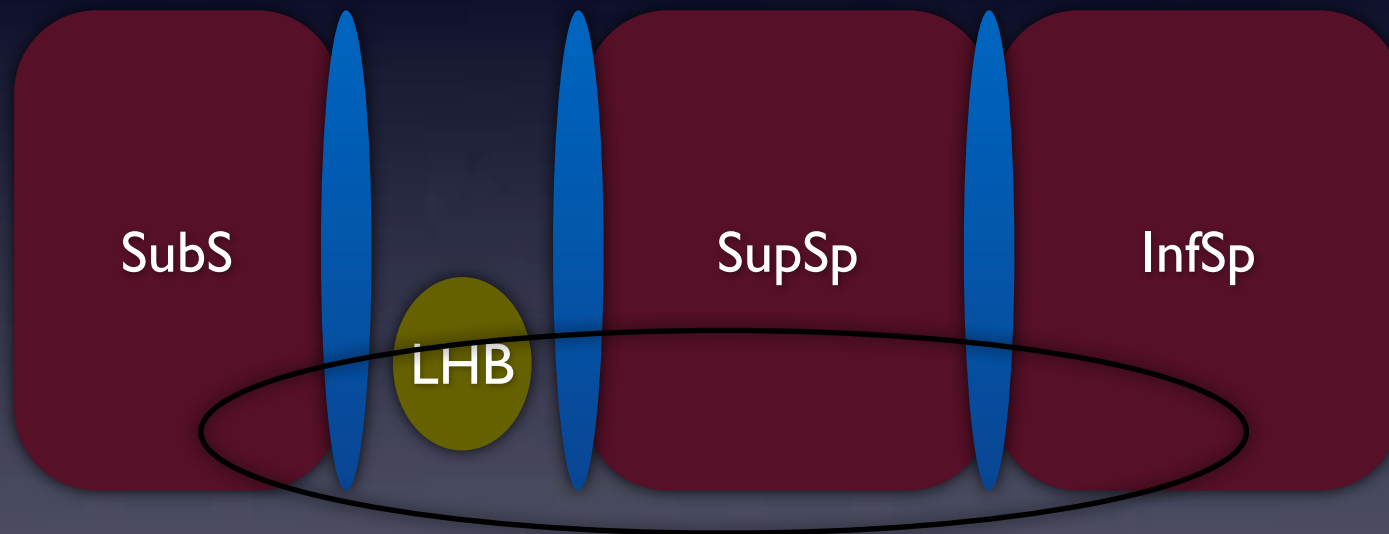
Tear Progression



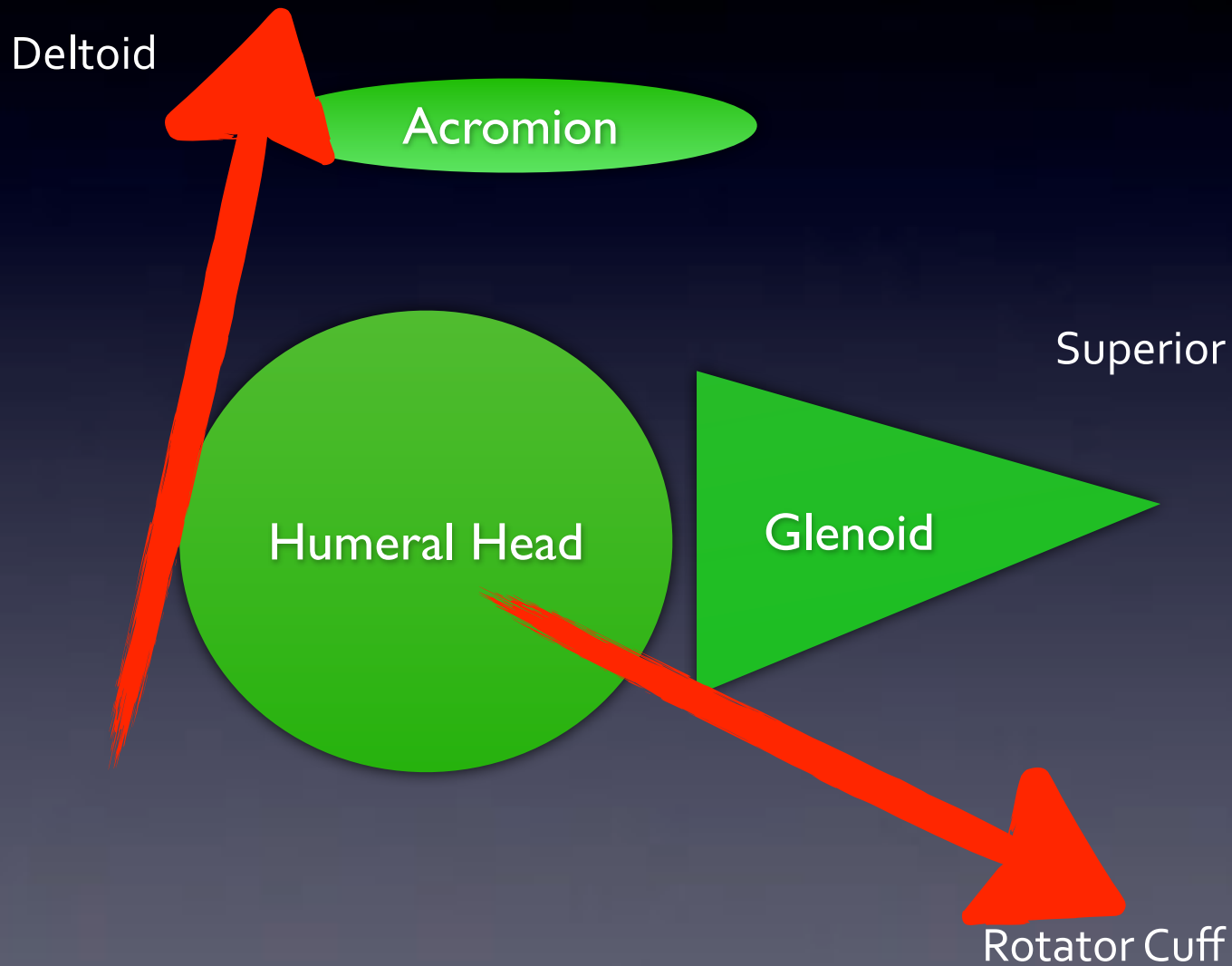
Tear Progression



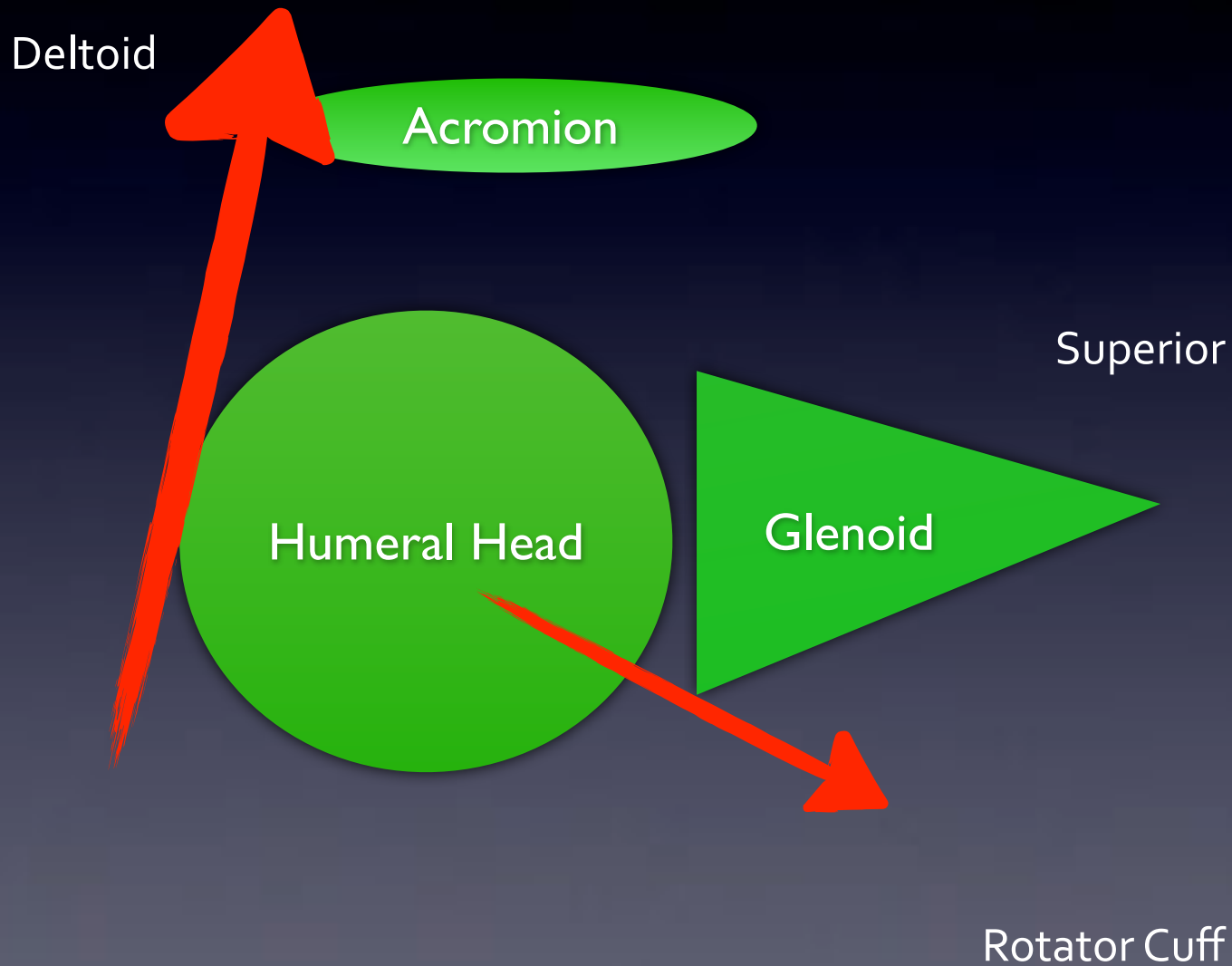
Massive Tear



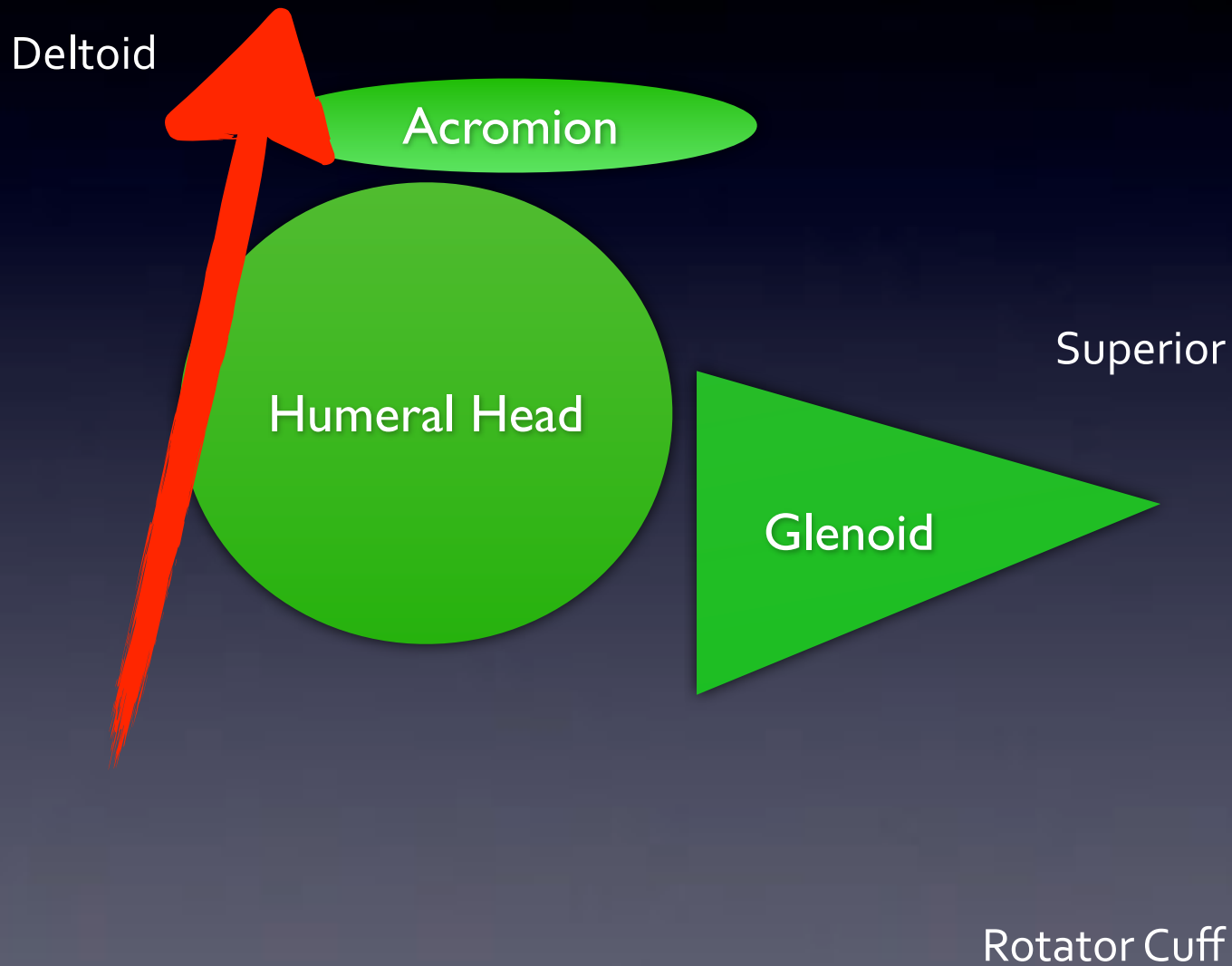
Cuff Dysfunction



Cuff Dysfunction



Cuff Dysfunction



Cuff Tear Arthropathy



Management Goals

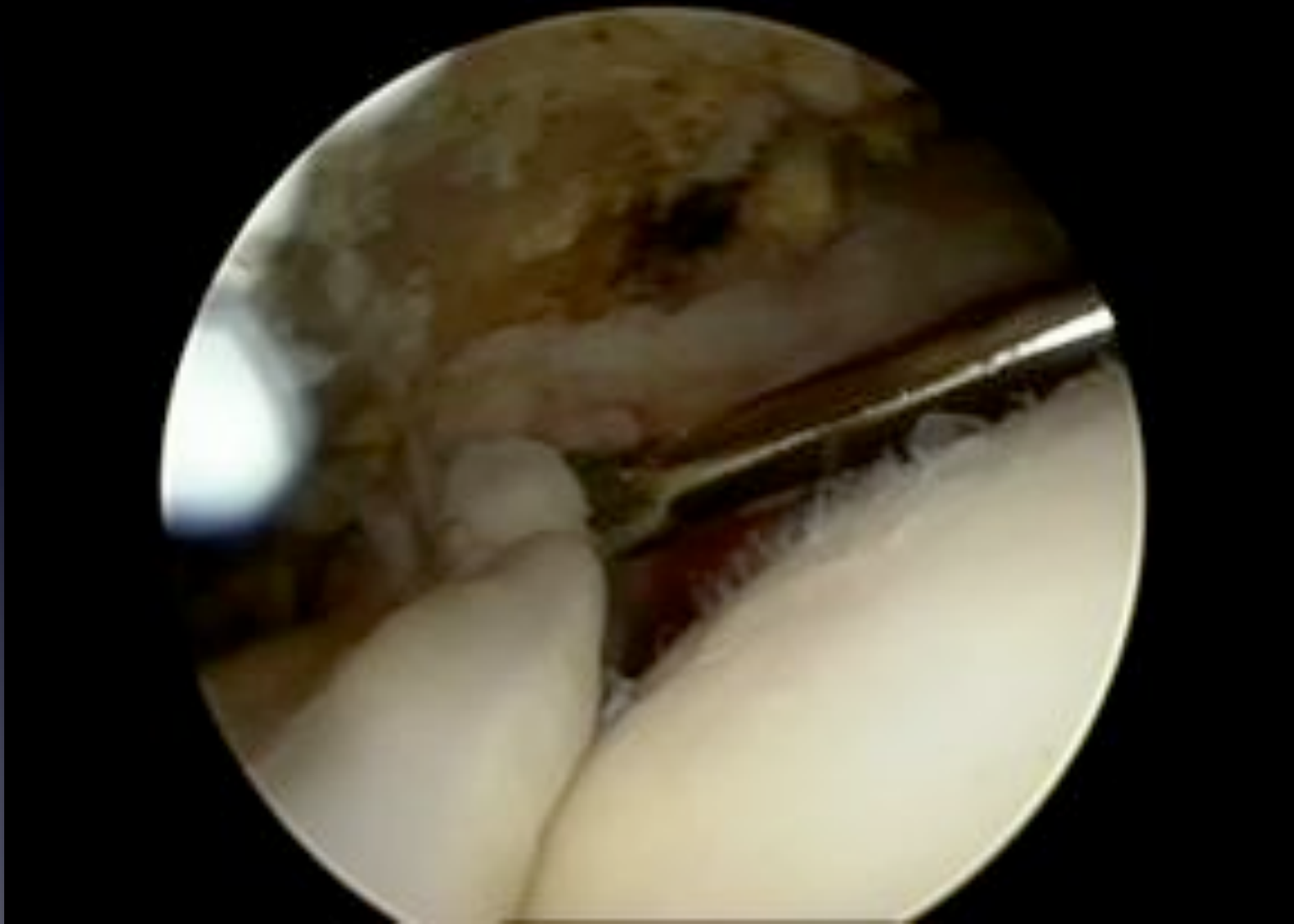
- Reduce Pain
- Maintain Function

Management Options

- Restore Anatomy
- Remove Pain Generators
- Rehabilitate
- Replace

Treatment Options

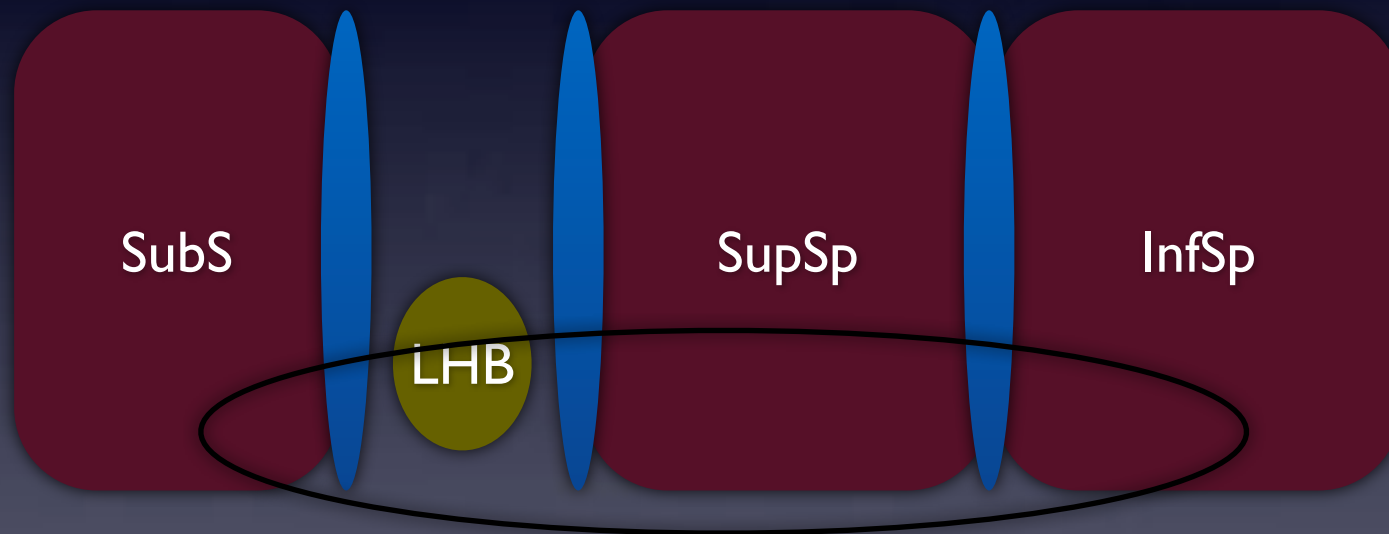
- **Restore Anatomy**
 - Rotator Cuff Repair
 - Quality / Mobility - tendon and muscle



Treatment Options

- **Restore Anatomy**
 - Rotator Cuff Repair
 - Quality / Mobility - tendon and muscle
 - Biology
 - Viable tenocytes in massive cuff tears = 0 (Carr et al)
 - Partial vs Complete repairs

Massive Tear



Treatment Options

- **Restore Anatomy**
 - Tendon Transfers
 - Latisimus Dorsi +/- Teres Major for Posterior Cuff
 - Pec Major for Anterior Cuff

Treatment Options

- Remove Pain Generators (non-surgical)
 - Analgesia
 - Injections
 - Nerve Blocks
 - Suprascapular
 - Lateral Pectoral

Treatment Options

- **Remove Pain Generators (Surgical)**
 - Debridement / Decompression / Bursectomy / Tuberooplasty
 - Retain CoracoAcromial Arch
 - LHB Tenotomy / Tenodesis
 - Suprascapular Neurectomy

Treatment Options

- Rehabilitation
 - Painfree
 - Passive ROM
 - Anterior Deltoid Strengthening



Treatment Options

- **Replace**
 - Hemiarthroplasty
 - Reverse Geometry Shoulder





- Thank You
- Any Questions?