

# Phase II Health Sciences as Applied to Coaching

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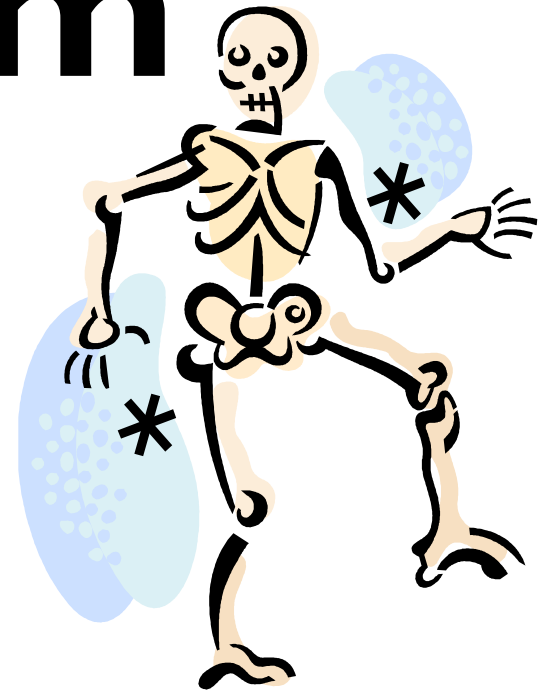


# Overview

- What is going to be covered today is.....
  - Skeletal System
  - Muscular System
  - Most common injuries to know about in your sport

Part One:

# The Skeletal System



# Skeletal System

- Main Part
  - Bones
- Main Function
  - Support the weight of the body
- Secondary Functions
  - Leverage
  - Protection
  - Storage
  - Blood Cell Production

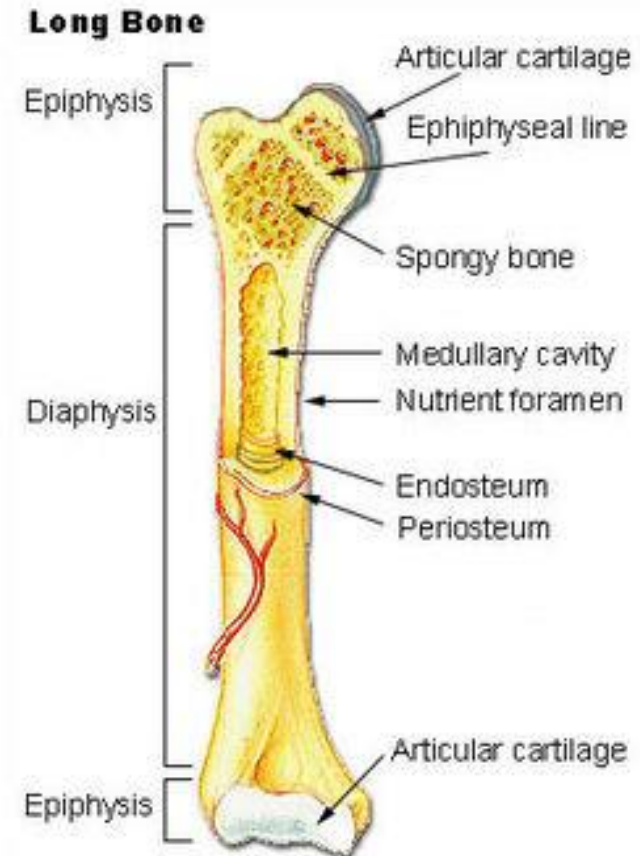
# Skeletal System Con't

- **Types of Bones**

- Long
- Short
- Flat
- Irregular
- Sesmoid

- **Cells in Bones**

- Osteocytes
- Osteoclasts
- Osteoblasts



# Skeletal System Con't

- Bone and Growth Development
  - Starts six weeks after fertilization
  - Ends between 18 and 25 years
  - Bone Closures different from bone to bone
  - Babies do not fully develop their patella (knee caps) until around 18 months old
  - Usual closures are 18 in women and 20 in men
    - differences in sex hormones

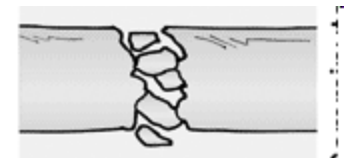
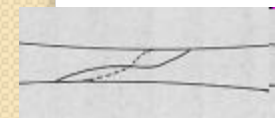
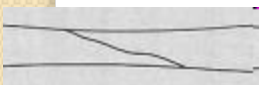
# Requirements for Normal Bone Growth

- Calcium and Phosphate
- Vitamin D
- Vitamins A and C
- Injury and Repair

- Fracture

- Classified based on appearance

- Transverse- break across the bone at a right angle
- Oblique- bone breaks at an angle
- Spiral- easily confused with oblique- bone is broken in more than 1 plane
- Comminuted- crushed bone



# Skeletal Divisions

- 206 Separate Bones
- Axial
  - Skull
  - Vertebrae
  - Thoracic Cage
  - Ribs
  - Sternum



# Skeletal Divisions Con't

- Appendicular Skeleton
  - Arms
  - Legs
  - Pectoral / Pelvic Girdles
- Major Bones Involved in Sports
  - Upper Body
  - Lower Body
- Joints / Articulations
  - Synarthrosis- offer no mobility (skull)
  - Amphiarthrosis- Some mobility (vertebrae)
  - Diarthrosis- freely moveable joints (shoulder, hip)

# Movements

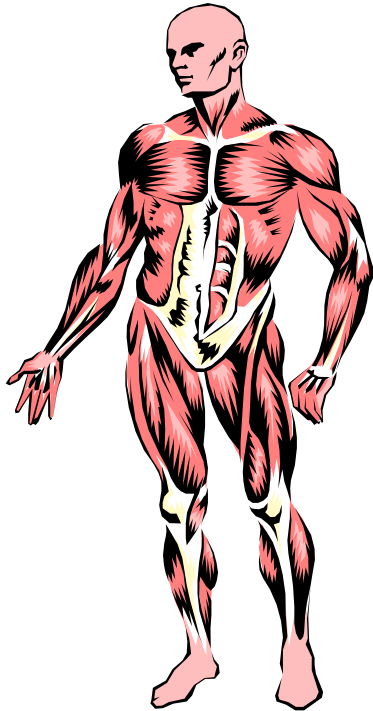
- Gliding
- Special Movements
  - Inversion
  - Eversion
  - Dorsiflexion
  - Plantarflexion
  - Opposition
  - Protraction
  - Retraction
  - Elevation
  - Depression
- Angular Motions
  - Flexion
  - Extension
  - Abduction
  - Adduction
  - Circumduction
- Rotation
  - Pronation
  - Supination

# Types of Joints

- Gliding – Clavicle and Manubrium
- Hinge – Knee and Elbow
- Pivot - Vertebrae
- Ellipsoidal - Scaphoid
- Saddle – Thumb and Trapezium
- Ball and Socket – Hip and Shoulder

Part Two:

# The Muscular System



# Muscular System

- The three types/ Main Functions
  - Cardiac- Heart (involuntary)
  - Smooth- controlled directly by the autonomic nervous system. (involuntary) ex: intestines, lungs
  - Skeletal- control movement of the body (voluntary)
- Movements
  - Flexors
  - Extensors
  - Adductors
  - Abductors

# Muscular System

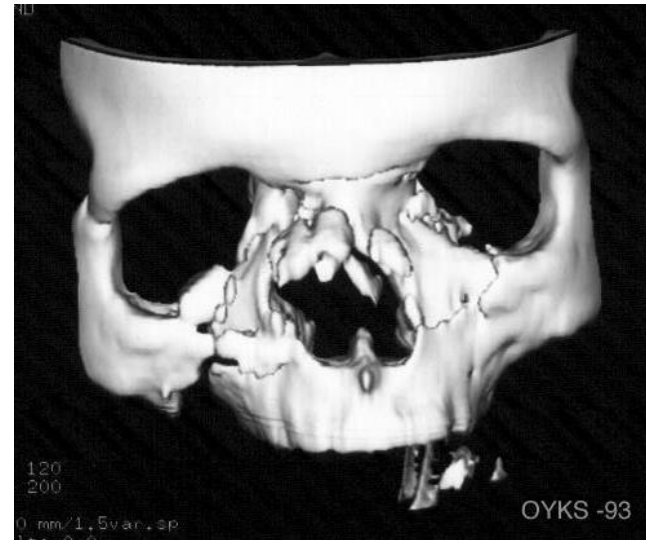
- Tendons
  - Connect muscles to bones
  - Muscles contract=> pull on the tendons=> pull on the muscles => causes movement
  - Strain tendons and muscles
- Ligaments
  - Connect bone to bone
  - Connect at the ends of muscles and keep them from slipping and sliding, and force them to bend
  - Sprain ligaments

# Major Skeletal Muscles

- Facial
- Neck
- Shoulder
- Arm
- Forearm
- Thorax/ Back
- Abdomen
- Hip
- Pelvis
- Thigh
- Leg
- Lower Leg

# HEAD Injuries

- Concussions
- Lacerations
- Fractures
- Eye
- Teeth

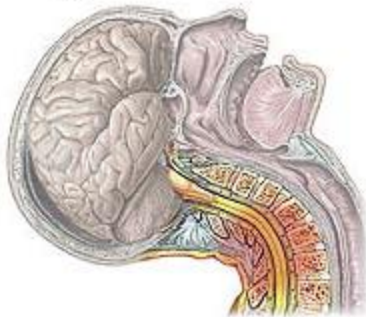




# Neck Injuries

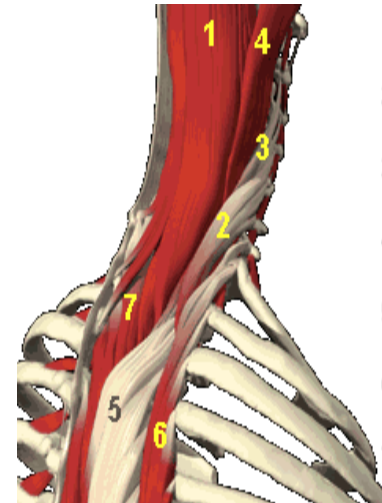
- Whiplash
- Strains
- Hyperextension

Hyperextension



Sprain or strain of cervical tissues

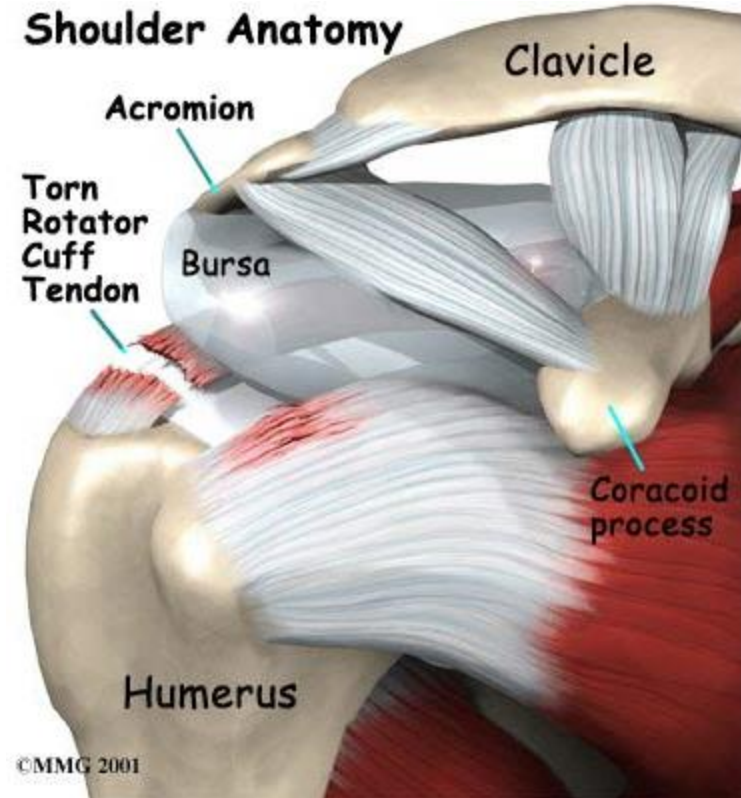
Hyperflexion



1. Semispinalis Capitus (head rotation/pulls backward)
2. Iliocostalis Cervicis (extends cervical vertebrae)
3. Longissimus Cervicus (extends cervical vertebrae)
4. Longissimus Capitus (head rotation/pulls backward)
5. Longissimus Thoracis (extension/lateral flexion vertebral column, rib rotation)
6. Iliocostalis Thoracis (extension/lateral flexion vertebral column, rib rotation)
7. Semispinalis Thoracis (extends/rotates vertebral column)

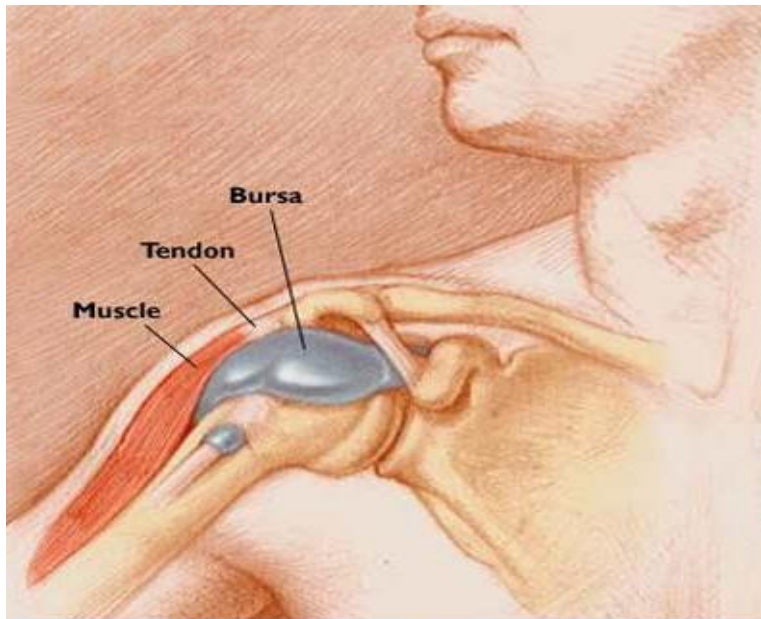
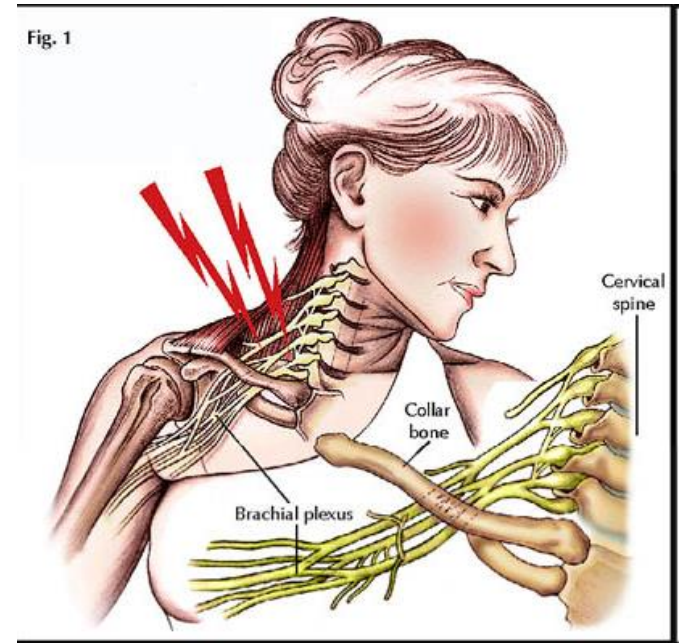
# Shoulder Injuries

- Dislocations
- Separations
- Rotator cuff

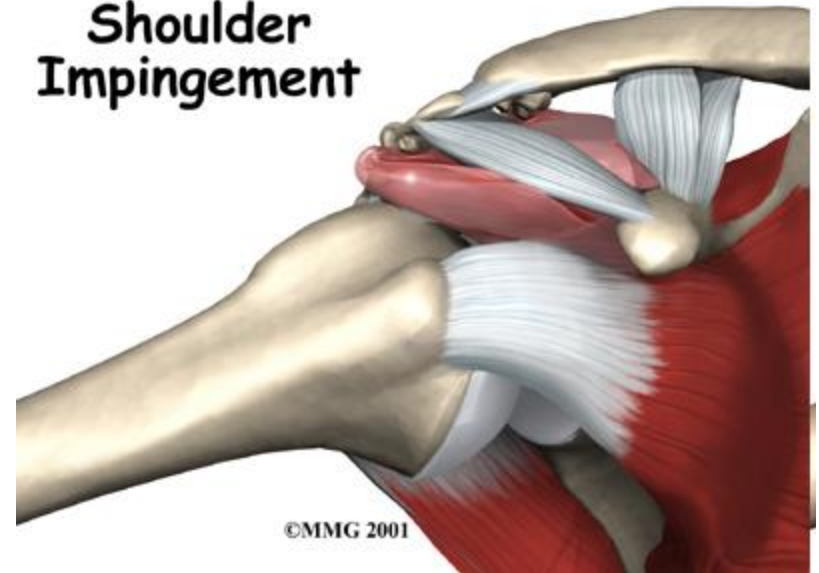


# Shoulder injuries

Bursitis  
Impingement  
Stingers/ Burners

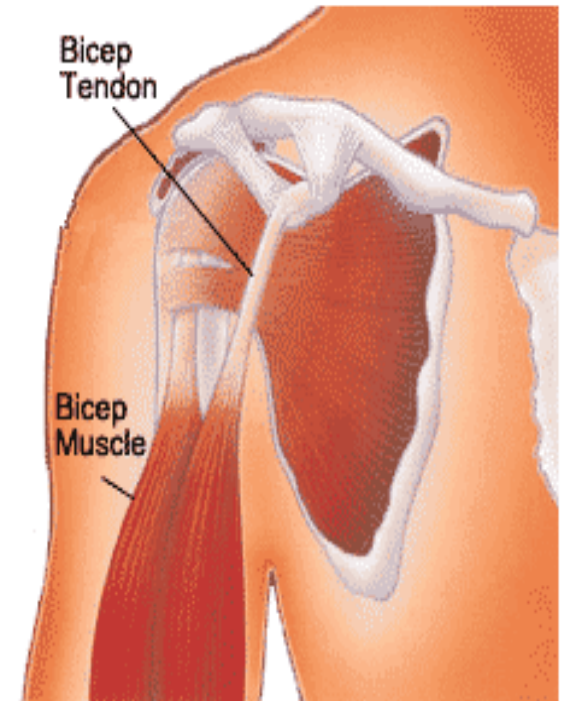


## Shoulder Impingement



# Arm Injuries

- Bicep tendonitis
- Strains
- Torn Biceps

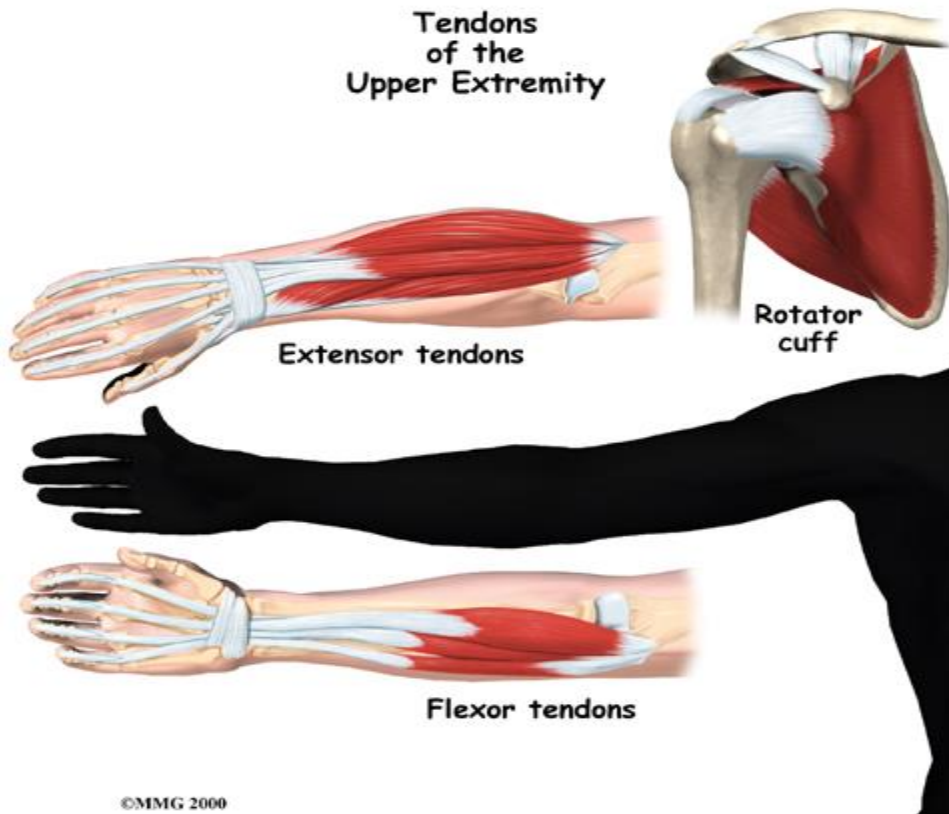


# Elbow Injuries

- Medial Epicondylitis (Little League elbow)
- Lateral Epicondylitis (Tennis elbow)
- Bursitis
- Dislocations



Tendons  
of the  
Upper Extremity



# Forearm Injuries

- Breaks
  - Radius
  - Ulna



# Wrist Injuries

- Sprains
- Strains
- Tendonitis
- Dislocations



# Finger Injuries

- Dislocations
- Breaks



Swan neck deformity

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Boutonniere  
Finger  
Deformity



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# Most Common Injuries

## Thorax

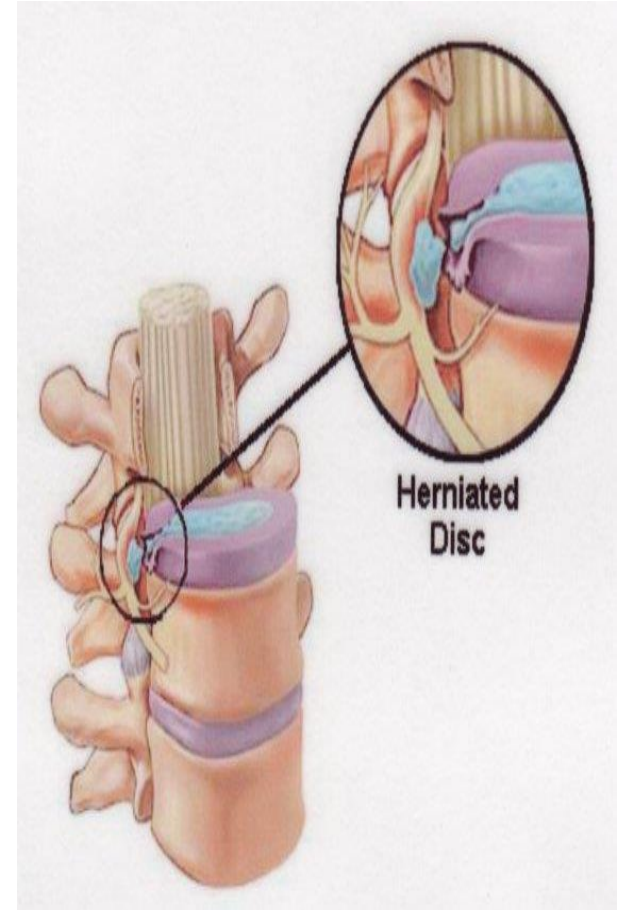
- Ribs:
  - Break
  - Fractures
  - Intercostals Muscle Strain
  - Contusions

## Abdomen

- Strains
- Internal Injuries

## Back

- Strains
- Sprains
- Discs Problems



# Most Common Injuries

## Lower Body



Hip Pointer

- Pelvis/ Hip

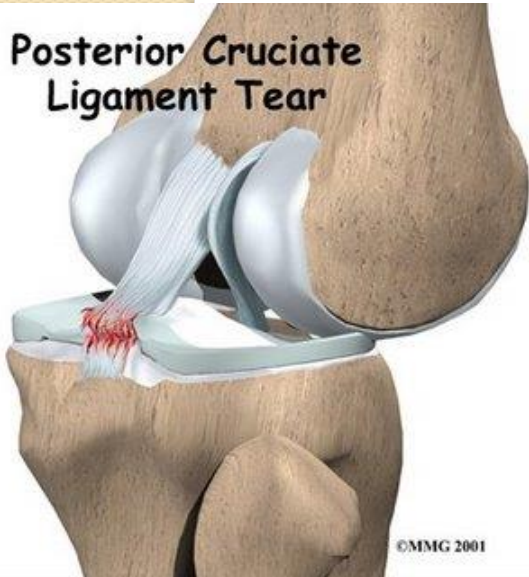
- Hip Pointer
- Groin Strains
- Contusions
- Bursitis
- Tendonitis
- Sports Hernia
- Sciatica
- Fractures
- Hip Flexor

- Quad/ Hamstring

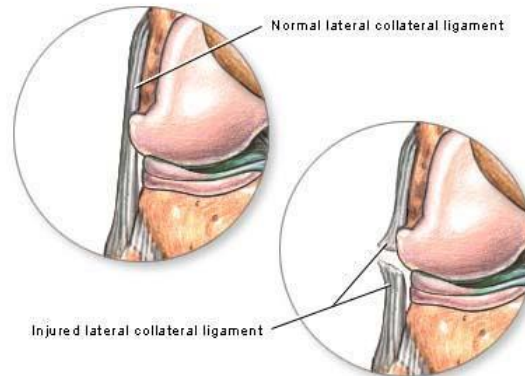
- Strains
- Tears

# Knee Injuries

- ACL, PCL, MCL, LCL
- Dislocation



Front of right knee

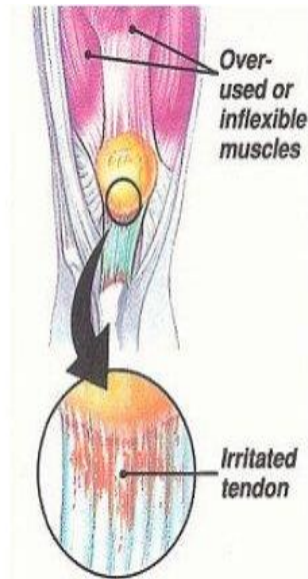


Injured lateral collateral ligament

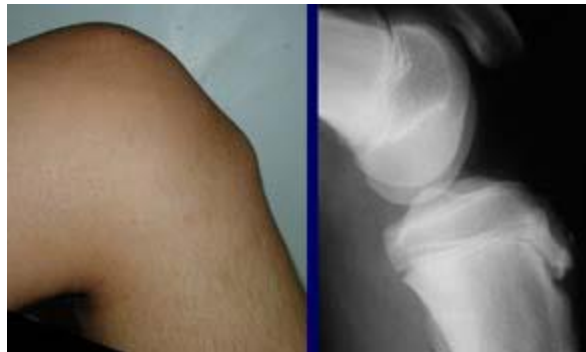
# Knee Injuries Cont.

- Tendonitis (Patella)
- Bursitis
- IT Band Syndrome
- Chondromalacia
- Osgood- Schlatter

## Patellar Tendonitis



Bursitis of the knee



Osgood- Schlatter

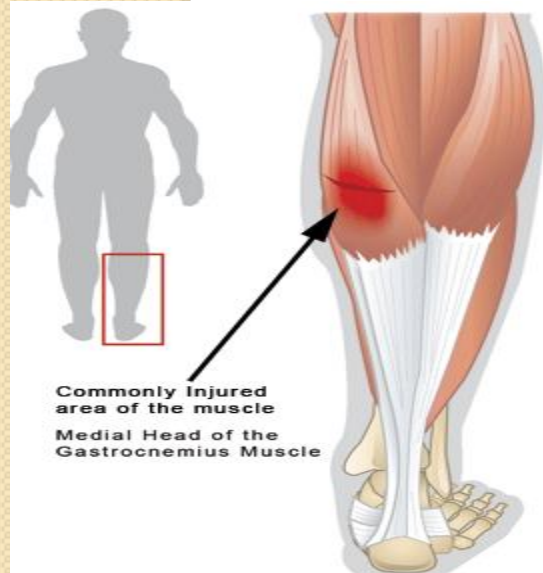
# Lower Leg Injuries

- Shin Splints
- Strains
- Fractures
- Stress Fractures
- Calf Strain
- Tears
- Achilles Tendonitis
- Bursitis



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## Shin Splints



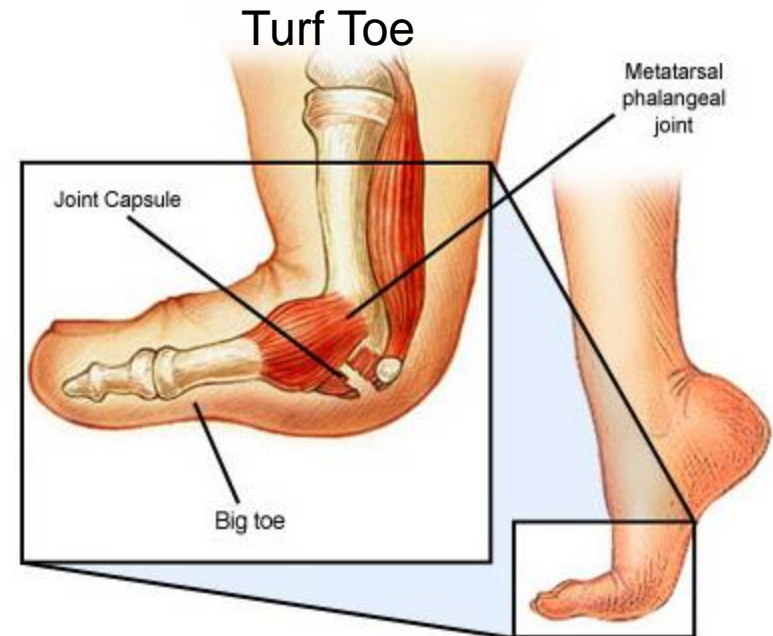
# Ankle Injuries

- Dislocations
- Fractures
- Sprains
- Tendonitis



# Feet/ Toe Injuries

- Stress Fractures
- Turf Toe
- Tendonitis
- Plantar Fasciitis



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# Feet/ Toe Injuries

- Heel Spurs
- Bursitis
- Bunions
- Corns/ Calluses



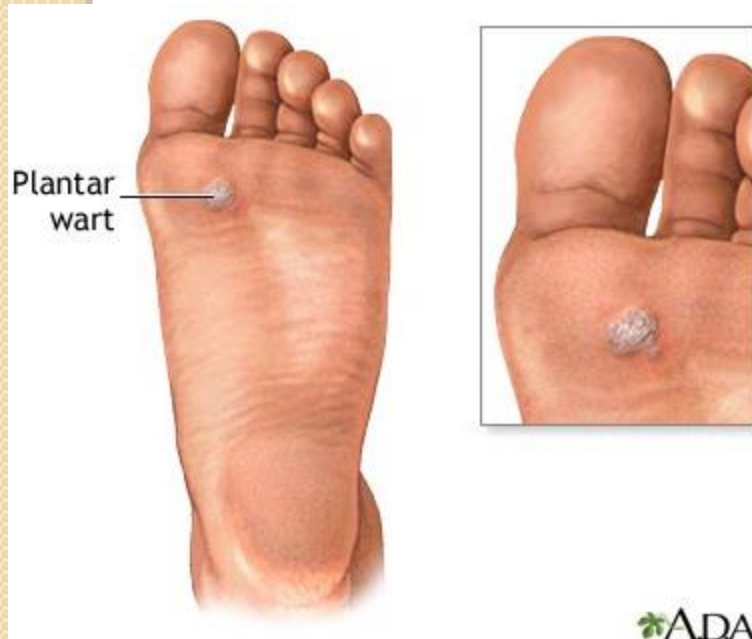
Bunion





# Toe/ Feet Cont.

- Flat Feet
- Falling Arch
- Hammer Toe
- Plantar Warts





Questions??????