

Skeletal System



Skeletal System

- ◆ Adult Human has 206 Bones
- ◆ This slideshow will offer fun ways to remember the names of some of the bones, and you can come up with your own tricks!

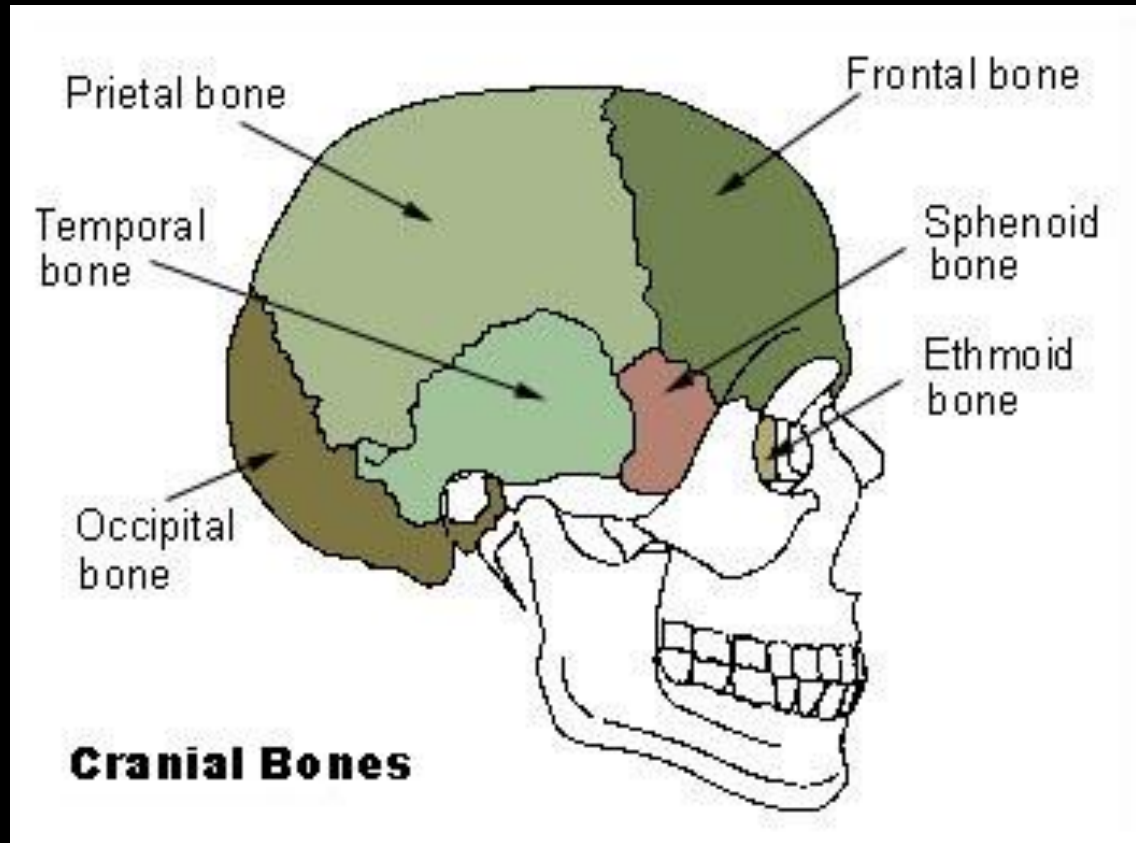
Functions of Skeletal System

- ◆ Framework—support body's muscles, fat, and skin
- ◆ Levers—muscles attach to bones to help provide movement
- ◆ Protection of vital organs
- ◆ Production of blood cells
- ◆ Storage of calcium

Skull

◆ Cranium

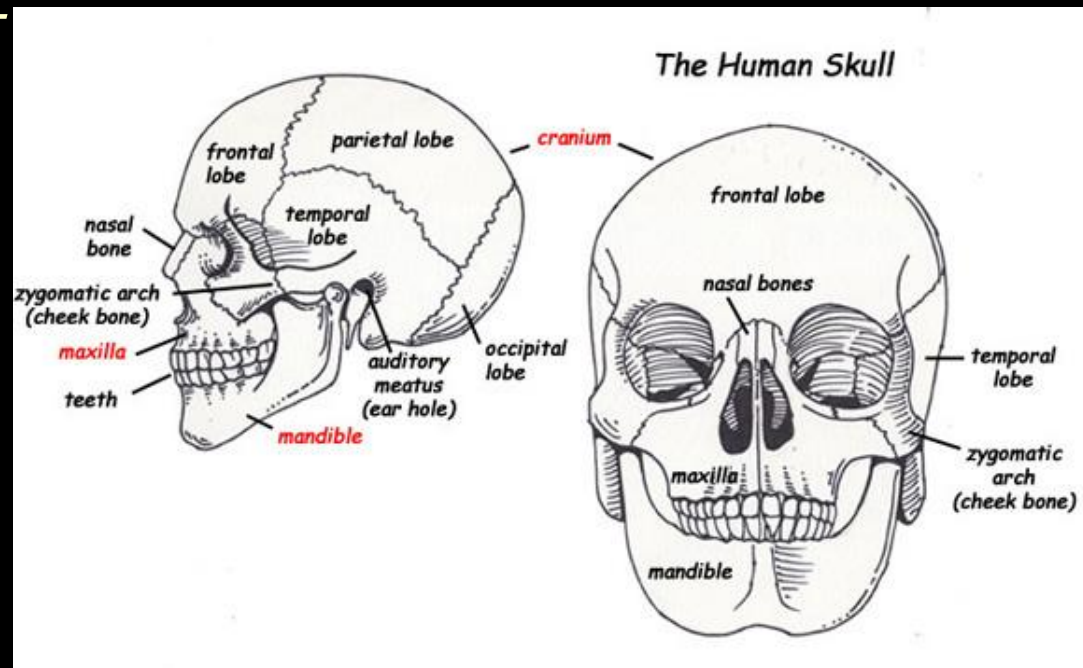
- Frontal
- Parietal
- Temporal
- Occipital
- Sphenoid
- Ethmoid



Skull

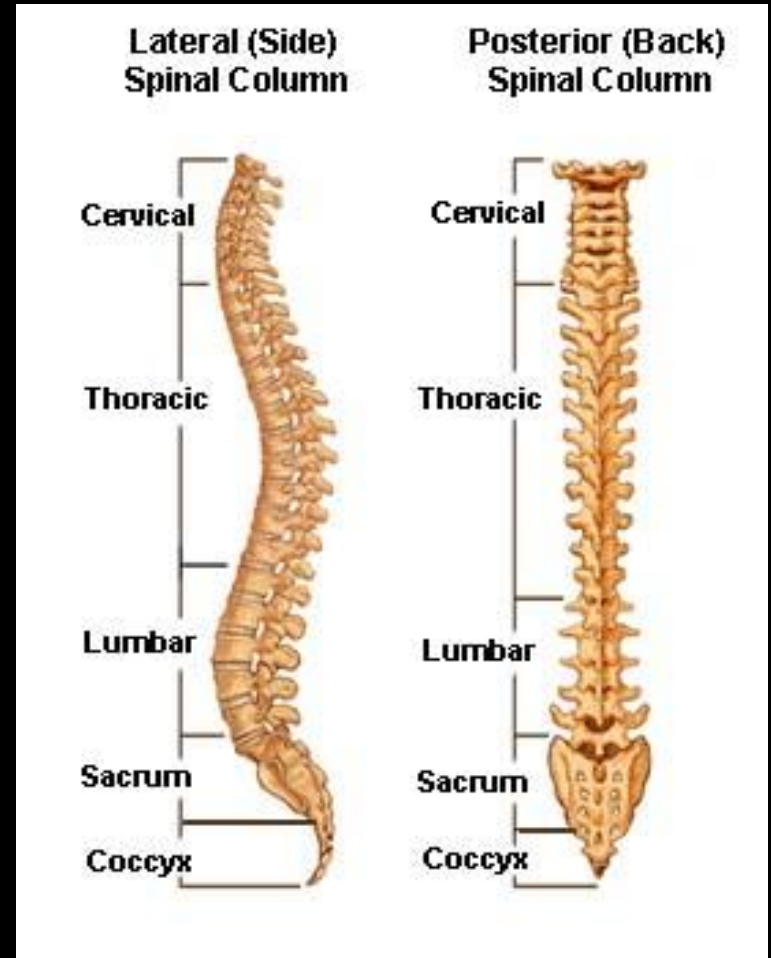
◆ Face

- Maxilla (*upper lip- “Max has a mustache”*)
- Mandible (*chinbone- “my, you have a manly chin”*)
- Zygoma
- Nasal bones



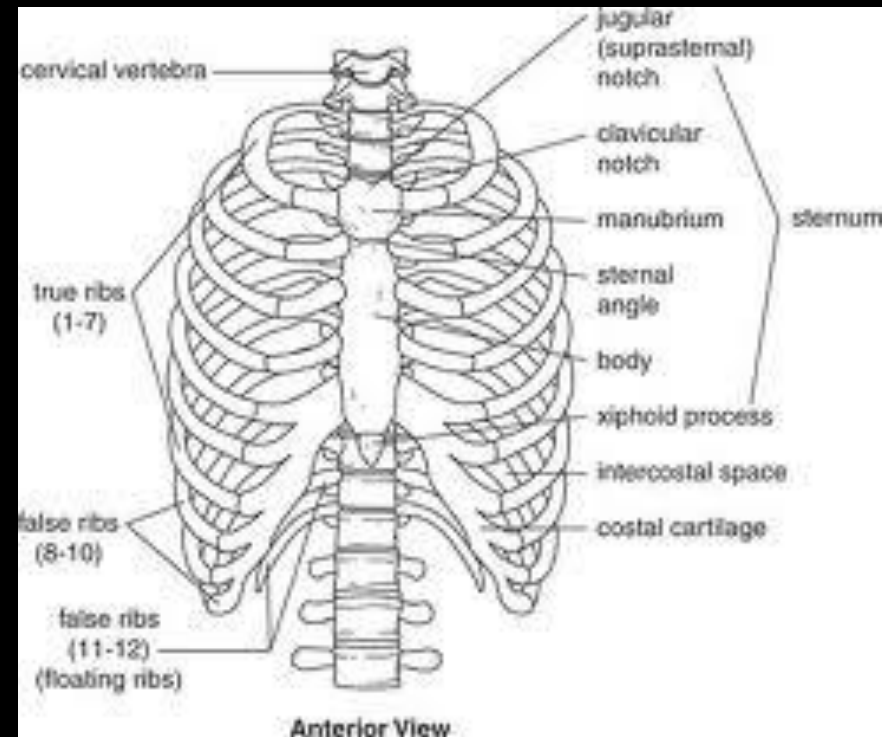
Spinal Column

- ◆ Cervical: 7 vertebrae
- ◆ Thoracic: 12 vertebrae
- ◆ Lumbar: 5 vertebrae
- ◆ Sacrum: 5 vertebrae (fused)
- ◆ Coccyx: 4 vertebrae (fused)
 - AKA tail bone



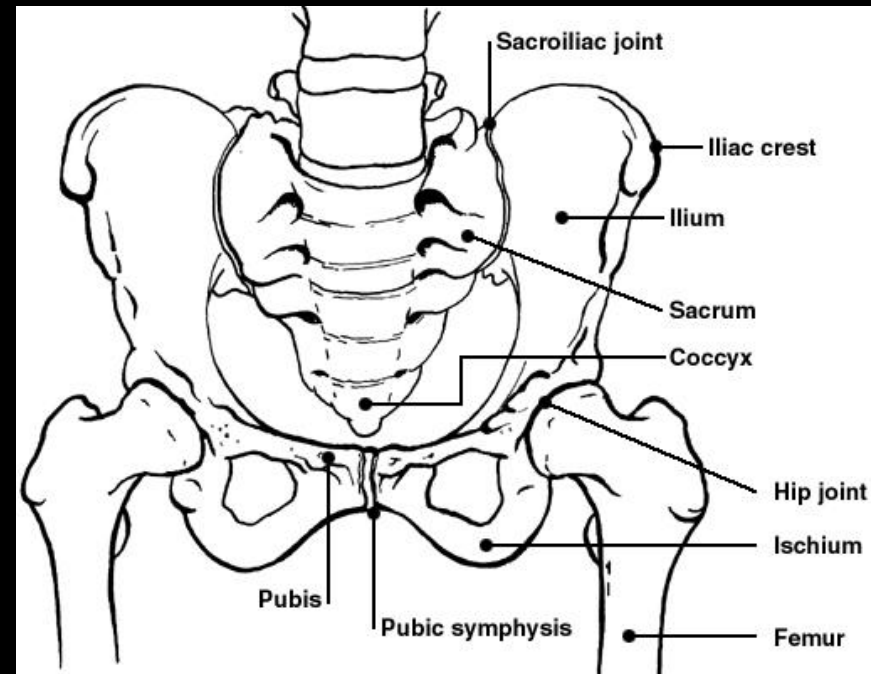
Thorax: Protects heart, lungs

- ◆ 12 pairs of ribs
 - First seven pairs are true ribs because they attach directly to the sternum
 - Next five are called false ribs—the first three pairs of these attach to the cartilage of the pair above, and the last two are called “floating” because they have no attachment on the front of the body
- ◆ Sternum



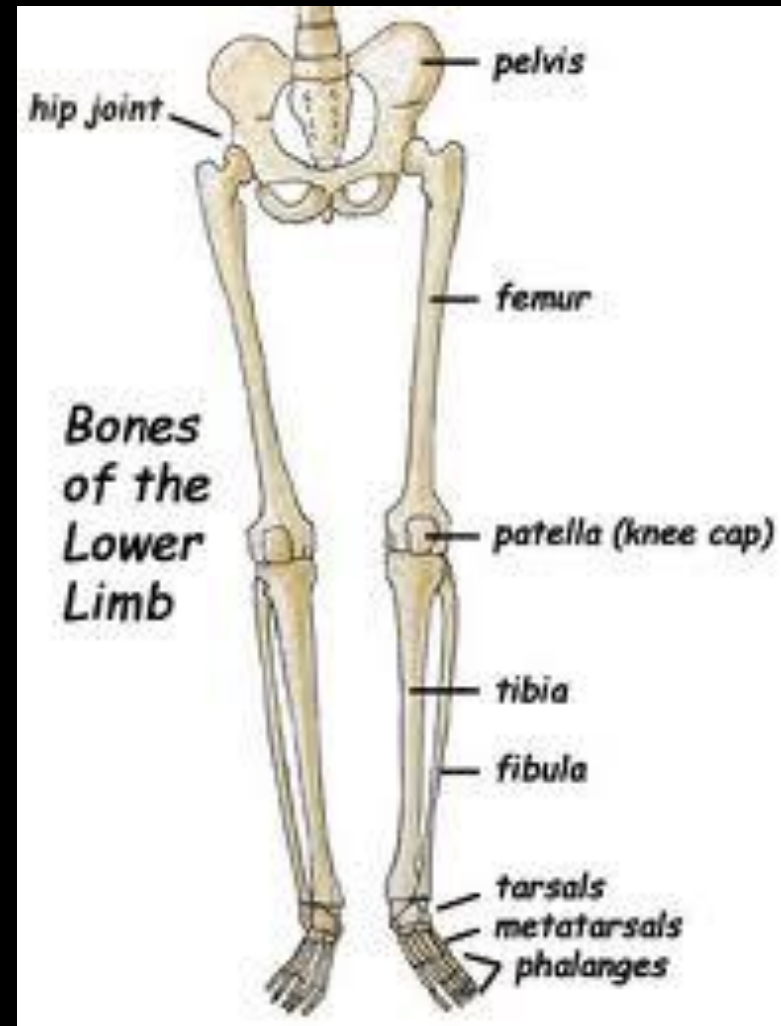
Pelvis

- ◆ Known as the Bony ring
 - Two innominate bones, each made of 3 fused bones
 - Ilium
 - Ischium
 - Pubis



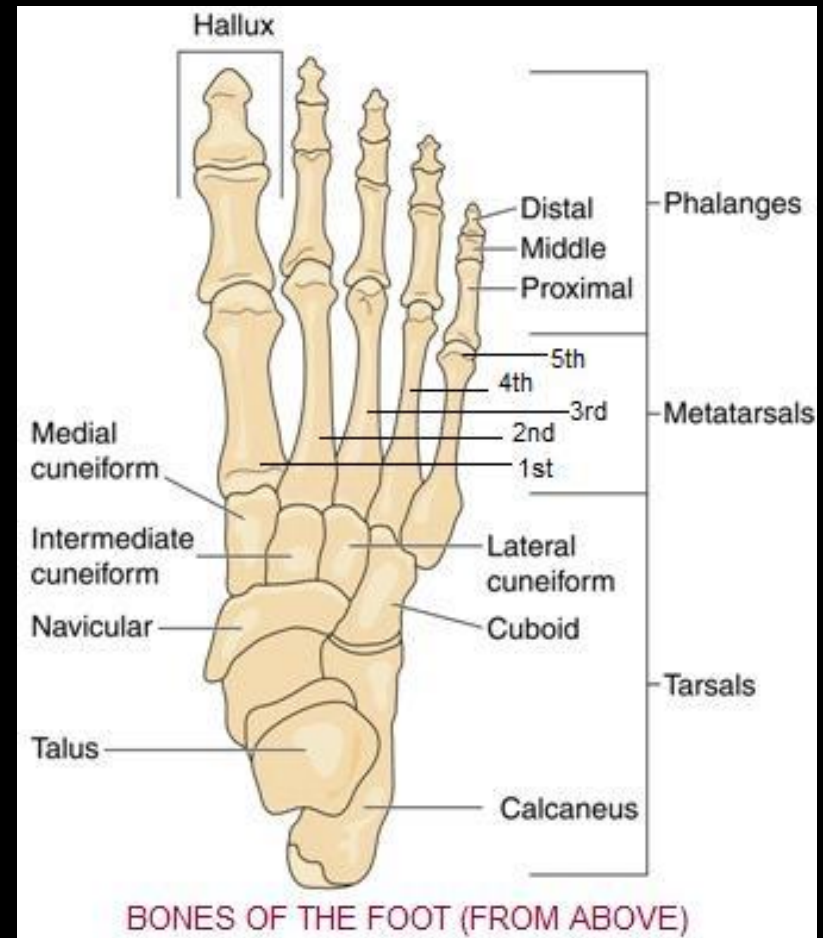
Lower Extremity

- ◆ Femur (largest bone in body)
- ◆ Patella (knee cap)
- ◆ Tibia (shin bone)
- ◆ Fibula (*if you tell a fib, you're "talking out of the side of your mouth" and this bone is on the side of your leg*)



Lower Extremity

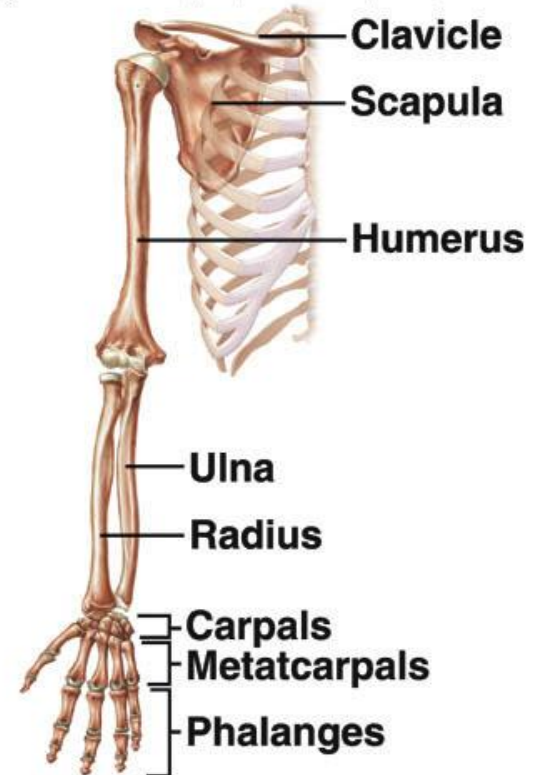
- ◆ Calcaneous
- ◆ Tarsals (*think of hot tar on your feet!*)
- ◆ Metatarsals (*longer word, longer bones*)
- ◆ Phalanges



Upper Extremity

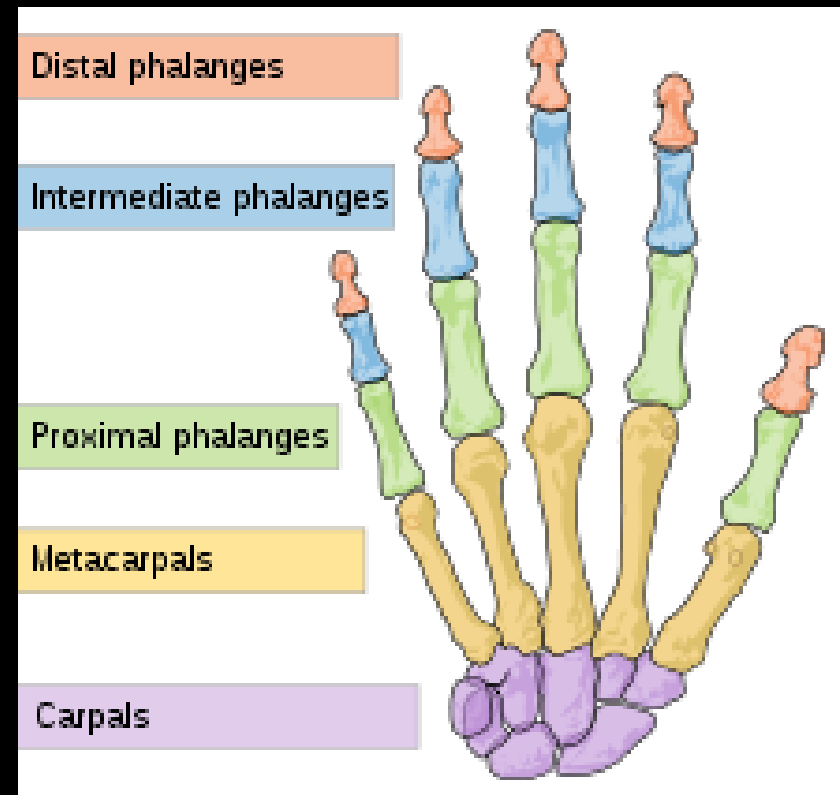
- ◆ Shoulder girdle
 - Scapula (*s=shoulderblade*)
 - Clavicle (*c=collarbone*)
- ◆ Humerus
- ◆ Radius (*put your thumb up and say Right on!— Radius, Right on!*)
- ◆ Ulna (*in same position, Ulna, Underneath*)

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Upper Extremity

- ◆ Carpals (*they're your Car Pals, they help you drive your car*)
- ◆ Metacarpals (*longer word, longer bones*)
- ◆ Phalanges



Joints

- ◆ Joining points of bones
- ◆ Bone-ends covered with cartilage
- ◆ Ligaments connect bone-to-bone
- ◆ Inner surface of joint capsule lined with synovial membrane
 - Produces synovial fluid
 - Lubricates joint

Extremity Trauma

Fracture Causes

- ◆ Direct force
- ◆ Indirect force
- ◆ Twisting forces
- ◆ Diseases of bones can lead to fractures
 - Osteoporosis—softening of the bone
 - Tumors
 - With disease processes, ask “did the fall cause the fracture or did the fracture cause the fall?”

Open vs. Closed Fractures (fxs)

- ◆ Closed (simple)= skin over fracture site intact
- ◆ Open (compound) = break in skin over fracture site
 - Bone ends do not have to be exposed
 - Small opening in skin communicating with fracture site = open fx
 - Open fractures more serious due to external blood loss, possible infection

Fractures

- **One of the most important things is to prevent closed fractures from becoming open ones.**
- **With a compound fracture be extremely careful with the bone ends—they can be sharp and cause a blood exposure**

Fracture Types

- ◆ Greenstick: common in children, incomplete fracture
- ◆ Colles: “s” shaped fracture of the radius, often due to victim trying to break a fall by outstretching his or her arms
- ◆ Spiral: common in ice skating, due to twisting motion

Greenstick



Fracture Types

- ◆ Comminuted: fractured
- ◆ Depressed (skull): bone sunken in

Fracture Signs: DOTS

- ◆ Deformity
- ◆ Open Injury
- ◆ Tenderness
- ◆ Swelling

What other signs/symptoms do you think you might see/the patient might feel?

Fracture Signs

- ◆ Swelling
- ◆ Pain
- ◆ Guarding (patient won't move injury)
- ◆ Crepitus
 - Grating of bone ends
 - May be heard or felt
 - Do **NOT** actively seek

Dislocation

- ◆ Displacement of bones from normal positions at joint

Dislocation Signs and Symptoms

- ◆ Deformity
- ◆ Swelling around joint
- ◆ Pain/tenderness in joint
- ◆ Loss of motion usually perceived as “locked” joint

Sprains

- ◆ Injury to ligaments
- ◆ Bone ends NOT displaced from normal positions



Sprain Signs

- ◆ Tenderness
- ◆ Swelling, ecchymosis
- ◆ Inability to use extremity
- ◆ No deformity

Management

- ◆ Splinting
 - Prevents further movement at injury site
 - Eases pain

Management

- ◆ When in doubt, get it checked out!
- ◆ It is often difficult to tell the difference between fractures, dislocations and sprains

Principles of Splinting

- ◆ Do **NOT** move patients before splinting unless patient is in danger
- ◆ Remove clothes to allow inspection of limb
- ◆ Note and record **circulation, sensation, and movement** of fingers or toes distal to injury before AND after splinting

Principles of Splinting

- ◆ Fractures: splint joint above AND below fracture
- ◆ Dislocations: splint bone above AND below joint

Principles of Splinting

- ◆ Minimize movement
- ◆ Support injury until splinting completed
- ◆ Pad splint to avoid local pressure

Arthritis

- ◆ **Group of diseases involving inflammation of the joints**
- ◆ **Two main types are osteoarthritis (most common) and rheumatoid arthritis**



Bursitis

**Inflammation of
the bursae
(small, fluid-
filled sacs
surrounding
the joints)**



Osteomyelitis

- ◆ **Bone inflammation usually caused by a pathogenic organism**
- ◆ **Signs/symptoms include pain at the site, swelling, chills, fever**
- ◆ **Treatment = antibiotics**



Osteoporosis

- ◆ **Softening of the bones**
- ◆ **Caused by hormone deficiency, sedentary lifestyle, and prolonged lack of calcium in the diet**

Osteoporosis

- ◆ **Prevention/Treatment: increased intake of calcium and vitamin D, medications to increase bone mass, exercise, exposure to sunlight, estrogen replacement**

Curvature of the Spinal Column

- ◆ **Kyphosis, scoliosis, and lordosis**
- ◆ **Treated with therapeutic exercises, firm mattresses, and braces**
- ◆ **Surgical repair for severe cases**



Ruptured Disk

- ◆ Also called herniated or slipped disk
- ◆ Most common site is at the lumbar-sacral area