

Musculoskeletal Injuries

Muscle System

- 600 muscles in the human body
- Gives the body its shape
- Protects internal organs
- Allows Movement of the body

Three types

Skeletal Muscle

- Attached to skeletal bones by tendons
- Allows movement of the body
- Voluntary- under conscious control
- Striated muscle
- Origin- proximal attachment
- Insertion-the distal attachment

Smooth Muscle

- Involuntary
- Found in walls of tubular structures in the body
- Contracts and relaxes to move contents in the system along the tube

Cardiac

- Involuntary
- Found only in the heart
- Needs constant blood supply, has its own circulatory system

Tendons and ligaments are the glue that holds the body together

Tendons-connect muscle to bone

Ligaments- connect bone to bone

Skeleton

- 206 bones in the body
- Framework of the body
- Allow movement
- Protect internal organs
- Produce red blood cells in the bone marrow found in the center of bones
- Reservoir for chemicals (calcium)
- Bone made up of:
 - Shaft has two condyles on the ends
 - Epiphyseal plate. Growth plate found on the ends of young bones

Six basic components of the skeletal system

Skull

- Cranium bones fused together

Spinal Column

- 33 vertebra, 7 cervical, 12 thoracic, 5 lumbar, 5 sacral, 4 coccyx
- Spinal cord runs through the spinal canal inside the vertebra
- Nerves branch *off* and exit between the vertebra

Thorax

- 12 pair of ribs
- Last two ribs are "false" ribs. They float, not attached to sternum
- Angle of Louis- bump where clavicles join the sternum

Pelvis

- 3 fused bones: ilium, ischial, pubis
- Acetabulum- joint where femur joins the hip

Upper extremities

- Arms, Hands

Lower extremities

- Legs, feet

Kinds of injuries

Fracture- a break in the bone

Strain- Stretched muscle or muscle and tendon

Sprain- injury to a joint or tearing of a ligament

Injuries are associated with external forces

- Falls
- Collisions
- Sports
- Direct force
- Indirect force
- Twisting forces

Signs and symptoms

- Deformity/ angulation
- Pain
- Tenderness
- Swelling
- Crepitus
- Disfigurement
- Weakness
- Loss of function
- Bruising
- Exposure of bone

No pulse and cyanosis distal to an injured extremity is a serious condition

Assessment

- When did the injury occur
- What happened
- Where does it hurt
- What did you feel at the time of the injury

Types of injury

Open- bone punctures through the skin

- May restrict blood flow
- Excessive bleeding
- Increased pain
- Paralysis

Closed- no open wound of the skin

Care of skeletal injuries

- BSI
- Oxygen as indicated
- In-line traction
- Manual stabilization
- Ice packs
- Elevation
- Transport

Splint- device used to immobilize a body part

- Prevents movement of bone fragment
- Prevents further injury
- Reduce pain
- Minimize damage to muscle, nerves and blood vessels

Rules of splinting

- PMS before and after splinting
- Immobilize joints above and below injury
- Expose injury site
- Treat soft tissue injuries
- If severe deformity- place limb in a neutral position
- Splint in position found if severe pain or crepitus present
- Do not push bone ends back into skin
- Pad splints
- Splint before movement in no life threatening injuries present
- If in doubt splint

Types of splints

Rigid- long board or other rigid devices

Traction- used on isolated femur fractures to keep bone ends from rubbing together

Vacuum- splints conform around the extremity; can be punctured by sharp object either inflates around the extremity or the air is vacuumed out of the splint

Pressure- inflated around the extremity holds pressure on the fracture (MAST/ PASG)

Pillow- pillow used to immobilize the joint used for ankle injuries

Improvised- newspaper, magazines, etc

Sling and Swath- used to immobilize the upper extremities

Hazards of improper splinting

- Nerve damage
- Tissue damage
- Blood vessel damage
- Delay in transport
- Reduce circulation
- Aggravation of injury and surrounding tissue
- Paralysis- loss of function of an extremity

Use of traction splints

- Do not use if:
 - Injury is 1"-2" from joint
 - Knee is injured
 - Hip injury
 - Pelvis injury
 - Amputations or partial amputation
- Check PMS
- Apply manual in-line traction
- Adjust splint to uninjured leg
- Ischial pad rests against bony prominences of buttocks
- Raise foot rest
- Apply ischial strap
- Apply ankle hitch
- Attach traction splint to ankle hitch
- Apply traction until pain is reduced
- Fasten leg straps
- Check PMS
- Transport on Long back board

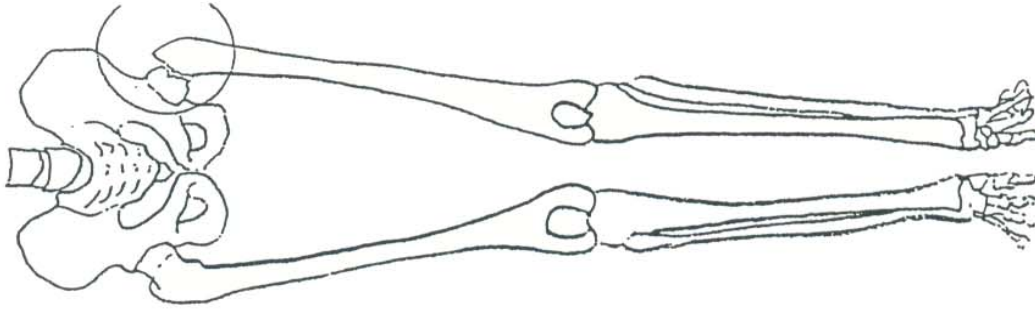
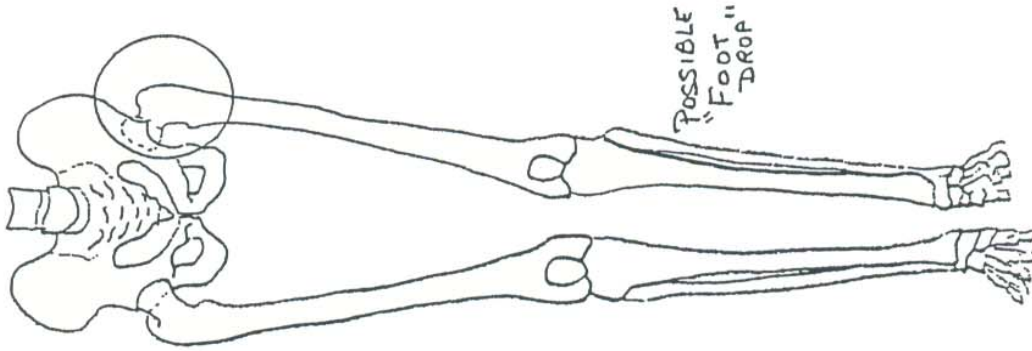
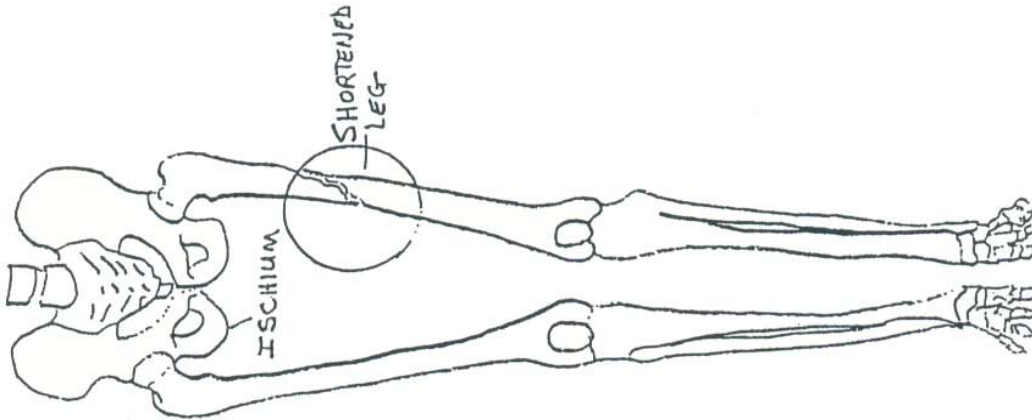
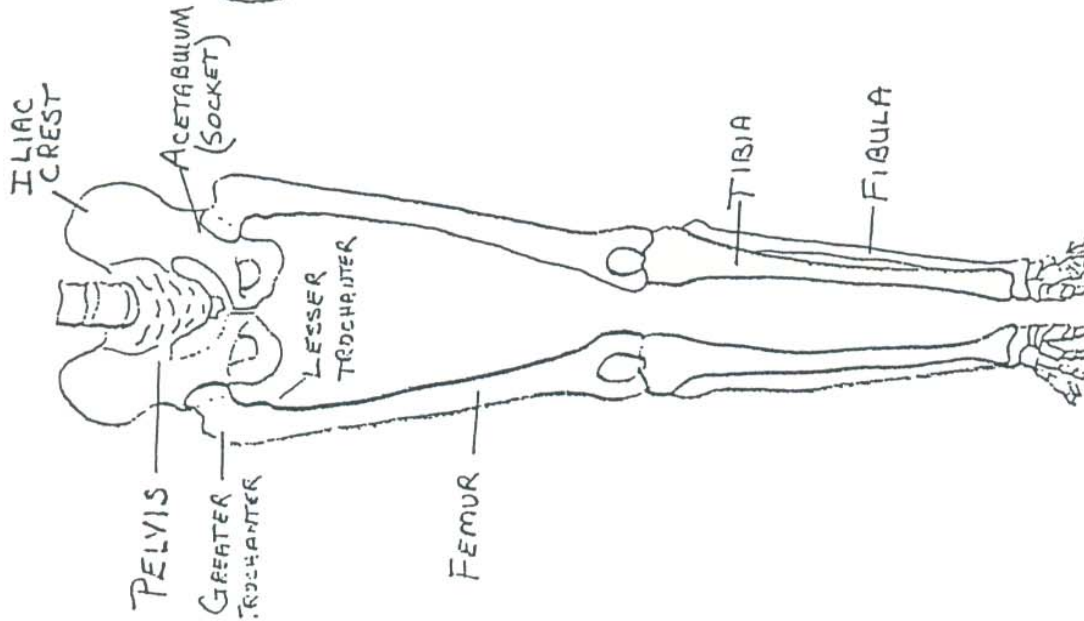
Dislocation- bone forced out of its socket

*****Remember IN IS OUT, OUT IS IN*****

Types of splints to use

- Hip-pillow LBB
- Long bone- rigid
- Upper extremity- Rigid and sling and swath
- Pelvis- MAST/ PASG or KED turned upside down
- Femur-Traction
- Shoulder, clavicle- sling and swath

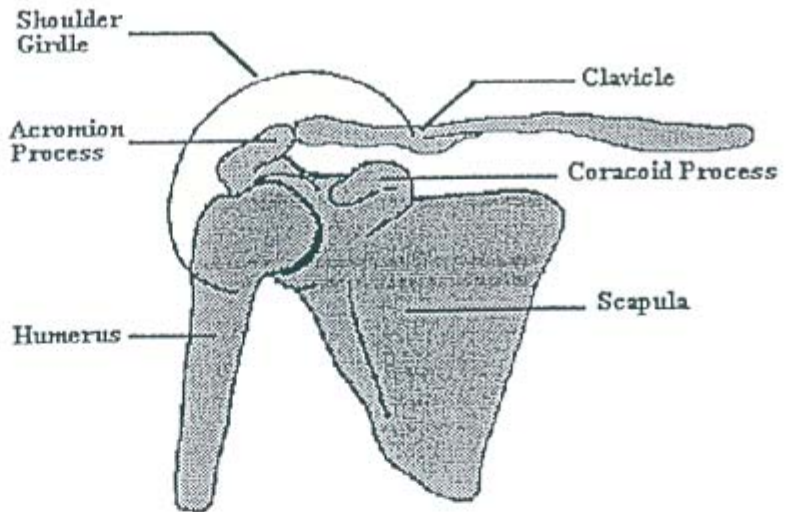
LOWER EXTREMITY INJURIES
WHEN IT'S IN IT'S OUT = DISLOCATION
WHEN IT'S OUT IT'S IN = FRACTURE



NORMAL TRACTION SPLINT _____ HIP Fx _____ NO
 FEMUR Fx _____ YES
 DISLOCATED L... _____ NO

Shoulder girdle

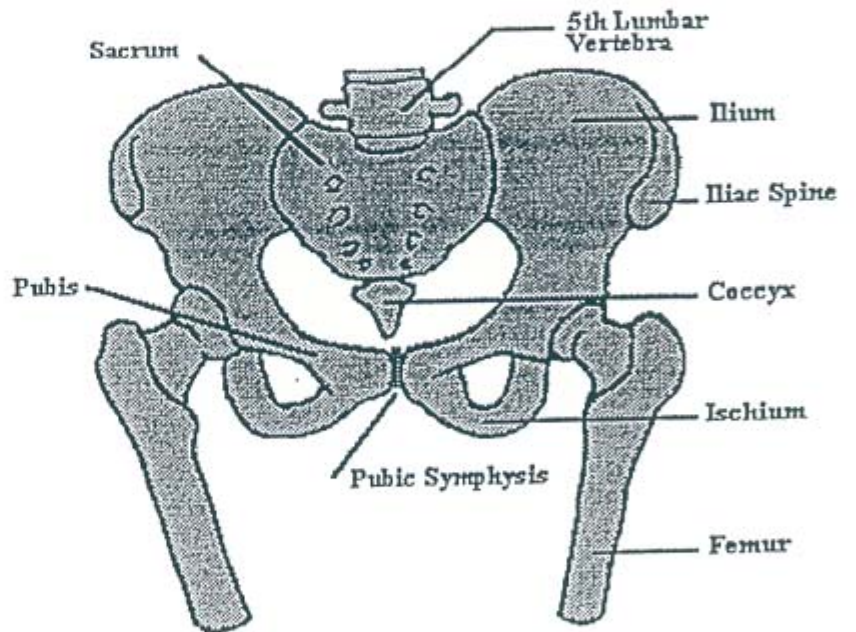
humorous- ~~humerus~~
clavicle
scapula



Pelvis

3 Bones

Ilium
Pubis
Ischium



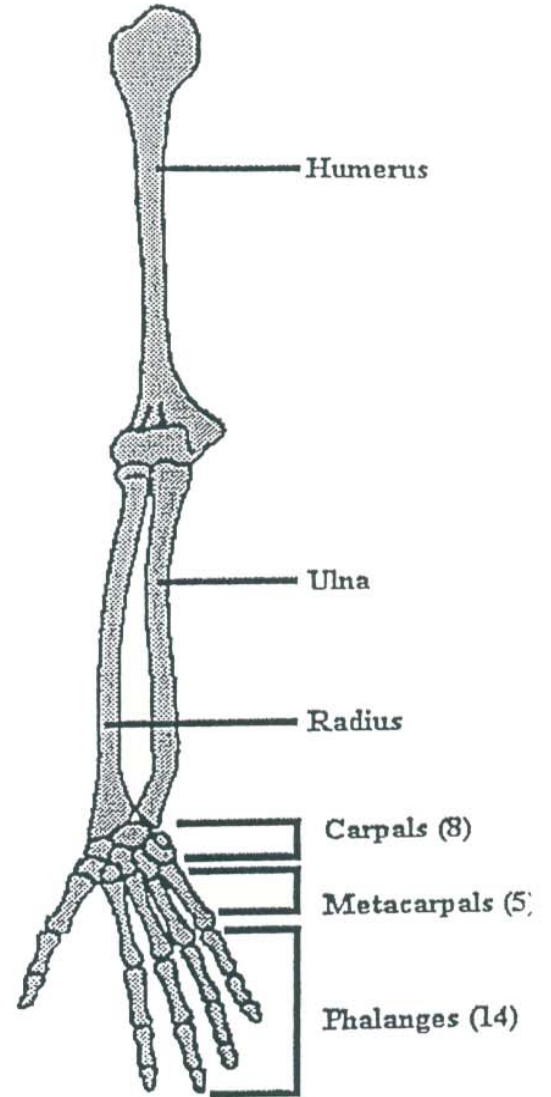
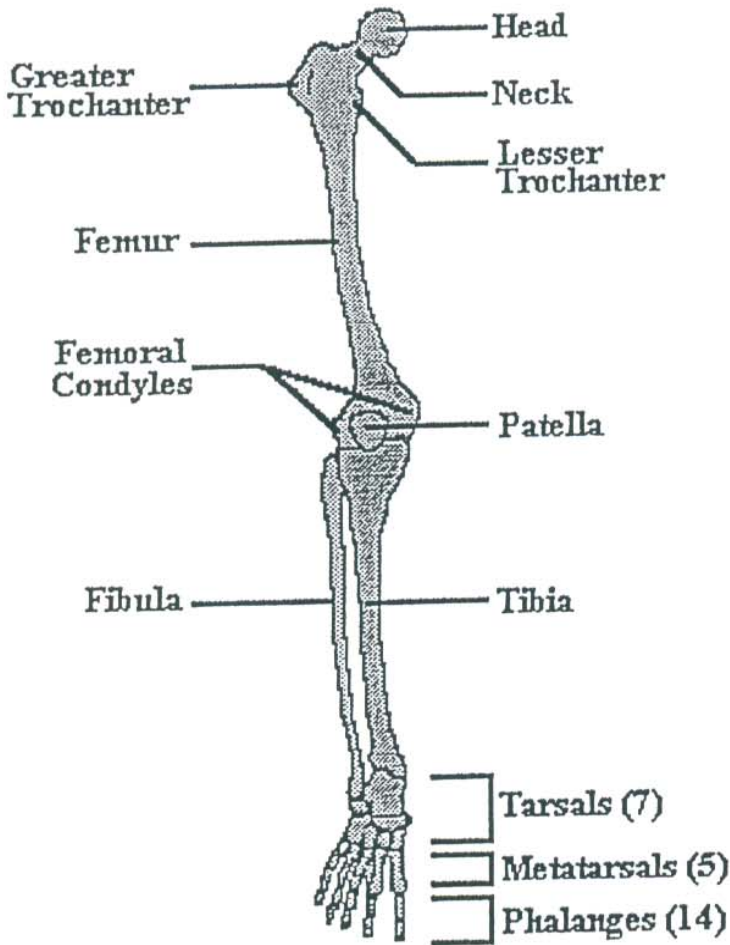
Hands

8 carpals
5 Metacarpals
14 Phalanges

Fingers - little, ring, long, index, and thumb

Joints:

thumb - ball and socket
fingers - hinge



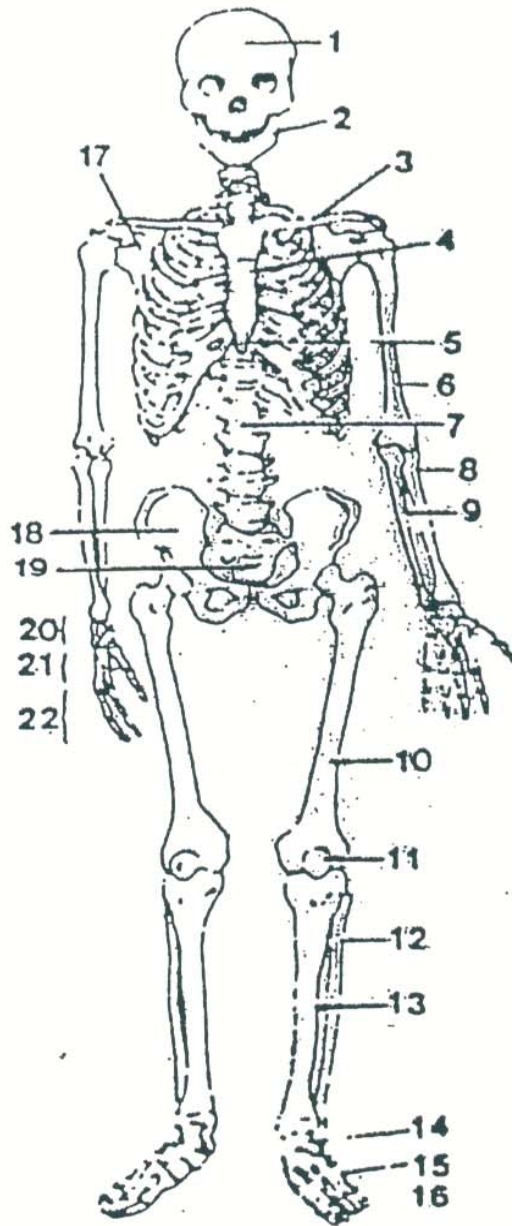
Feet

7 Tarsals
talus - ankle bone
calcaneus - heel bone

5 metatarsals
14 phalanges

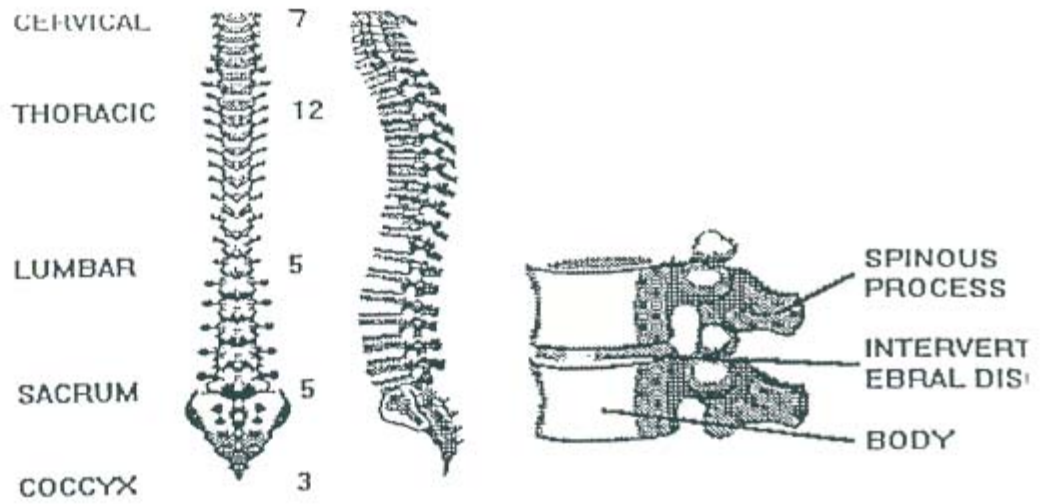
MAJOR BONES

1. Cranium
2. Mandible
3. Clavicle
4. Sternum
5. Xiphoid
6. Humerus
7. Spine
8. Radius
9. Ulna
10. Femur
11. Patella
12. Fibula
13. Tibia
14. Tarsals
15. Metatarsals
16. Phalanges
17. Scapula
18. Pelvis
19. Sacrum
20. Carpals
21. Metacarpals
22. Phalanges



Vertebrae

- * divided by body cavity
- * spinal cord
- * spinal canal



The Thorax

12 pairs of ribs

- 10 connected
- 2 floating

Costal arch - cartilage

