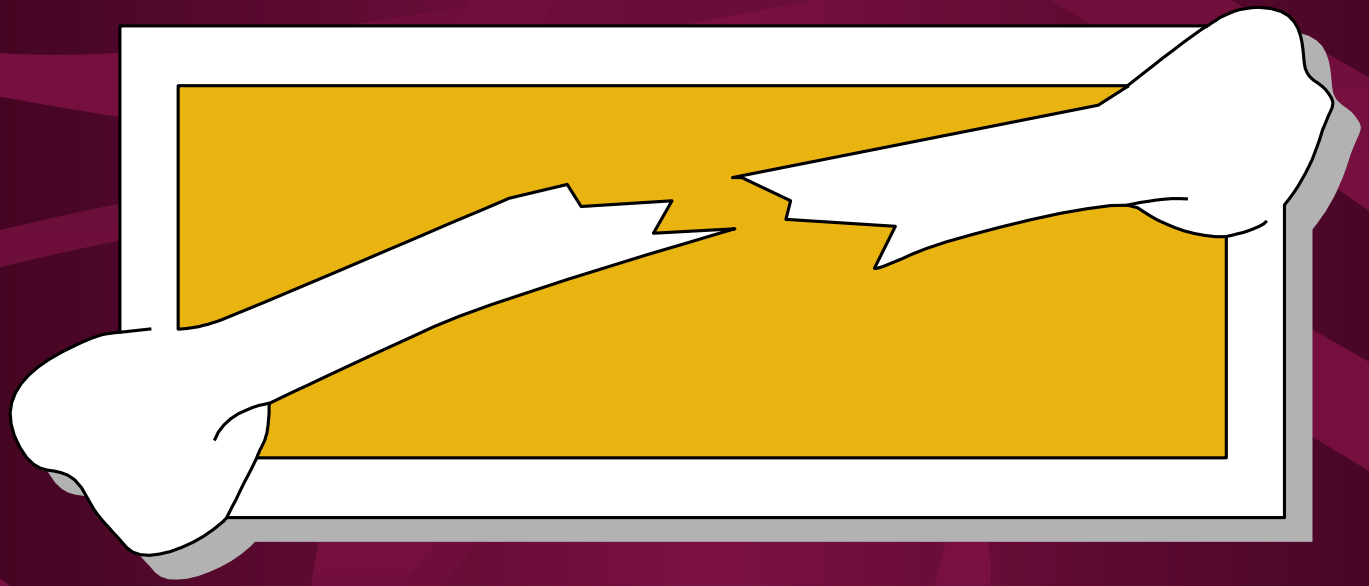
Bone, Joint, and Muscle Injuries



Fractures

- Open / compound
  - Skin is broken or damaged
- Closed / simple
  - Skin intact, no wound exists

Look For:

- DOTS
  - Deformity, open wounds, tenderness, swelling
- CSM
  - Circulation, sensation, movement
- Point tenderness
- Loss of use
  - (child's leg)
- Crepitus: grating sensation

Fractures: What To Do

- Most are not life threatening
  - Exceptions: Pelvis, spinal, some femer
- Treat for shock
- Look and feel (remove clothing around injury)
  - Pain, location ,numbness, tingling
- Check for DOTS

Fractures: What To Do #2

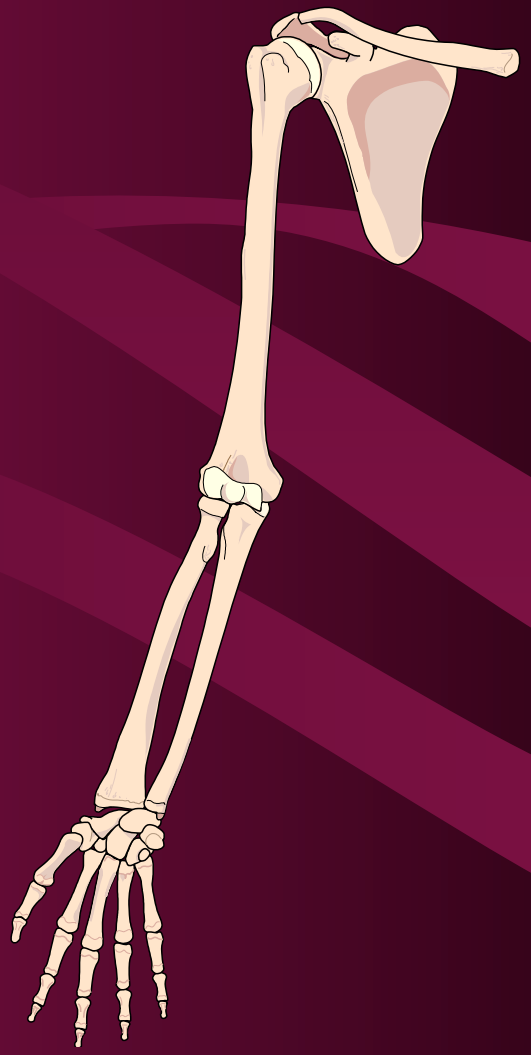
- Check CSM No circulation? Emergency!
  - Gently manipulate to restore blood flow
  - Bone could depress vessels or nerves
  - Capillary refill test
- Sensation - Squeeze fingers and toes
- Movement - Wiggle fingers and toes

Fractures: What To Do #3

- Control bleeding
- Cover wounds before splinting
- Splint in position you found it
- Splint all fractures before moving
- RICE

Signs of Fractures at Specific Sites

- Clavicle
- Humorous
- Radius and Ulna
  - May be absent of deformity
  - Pain on rotation
- Wrist
  - Lump-like deformity



Signs of Fractures at Specific Sites #2

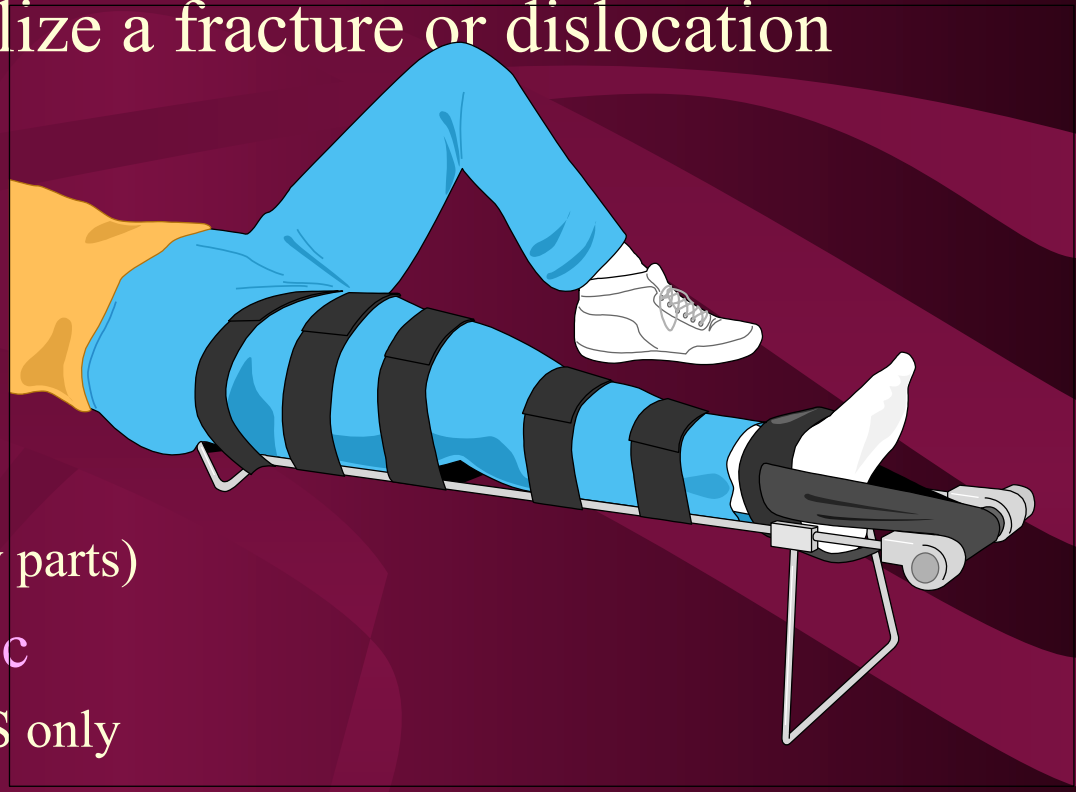
- Finger
  - Can't move
  - Often has twisted look
  - Compare
  - Percussion test (Kim)
- Toes
- Tibia and fibula
  - Serve as splints for each other

Reasons For Splinting

- Reduces pain
- Prevents further damage
- Prevents development of an open fracture
- Reduces bleeding and swelling
- If in doubt, splint

What Is A Splint?

- Device used to stabilize a fracture or dislocation
- Three types:
  - Rigid
    - Board (padded)
    - Cardboard etc.
  - Soft (air splint)
    - self splint (use body parts)
  - Traction or Anatomic
    - Used on femur, EMS only



Splint Application

- **Splint joints above and below the break / splint on both sides if possible**
- Check CMS after splinting
- RICE (unless pulse is absent)

Should I Ever Try To Reduce A Fracture?

- Only if :
  - In remote area and > 1 hour away / Deformed and angulated ???
  - Absence of CSM

Dislocations

- Joint is pulled apart
- Bone are not aligned properly

Dislocations: What To Do

- Check CSM
- Splint (do not reduce)
- Medical attention
  - Sometimes you may try to reduce a n anterior shoulder, kneecap or finger (wilderness)
- Never reduce: spine, elbow, wrist, knee, hip

Anterior Shoulder Dislocation

- Victim holds upper arm away from body
- Sling won't work
- Extreme pain
- Shoulder appears squared off
- Loss of function
- Physician realignment

Knee Dislocation

- Major artery behind knee
  - May need to avoid application on cold
- No ankle pulse? Try to realign once?
- Stabilize knee in present position
- Medical attention
- UC Davis athlete
- Splinting lab

Additional Extremity Injuries

- Sprains
- Strains
- Contusions
- Tendonitis
  - Treat all with RICE

Sprains

- Ligament damage
- Ligaments connect bone to bone
- Primary stabilizer of joints
  - Treatment: RICE

Strains

- Pulled muscle
- Occurs when:
  - Muscle extended beyond its normal range of motion
    - muscle is not warmed up (stretched)

Possible Signs of a Strain

- Sharp pain / stiffness
- Extreme tenderness
- Cavity, indention, bump
- Severe weakness or loss of function

Tendonitis

Inflammation of a Tendon

- Musculotendenous unit
  - Tendon connects muscle to bone
    - Tennis elbow
    - Little leaguers elbow
- Treatment: RICE

Muscle Contusions (Bruises)

- Swelling
- Pain
- Tenderness
- Discoloration
  - Treatment: RICE

Muscle Cramps (Uncontrolled Spasms)

- Night cramps and heat cramps
- May be caused by:
  - –Dehydration
  - –Electrolyte imbalance
- Charley horse

Muscle Cramps: What To Do

- **Stretch the muscle or Apply pressure**
- Consume fluid with electrolytes
  - Gatorade / sports drinks / lightly salted water
- Pinch upper lip, hard??
  - Acupuncture technique
- DO NOT MASSAGE

Ankle and Foot Injuries

- Leave shoe on? Some controversy
- Horseshoe shaped pad
- RICE
- Anti-inflammatory drugs

RICE

- Rest
- Ice
- Compression
- Elevation

RICE

- RICE will eliminate or reduce swelling = faster recovery
- NEVER use HEAT initially for sprains, strains, fractures, bruises etc.

Rest

- Speeds up healing
- Reduces blood flow to the area
- Reduces swelling
  - Using body part increases blood flow to the area

Ice

- Vasoconstriction
- Apply 20-30 minutes every 2-3 hours (variable)
- Apply for the first 48-72 hours
  - (variable – p. 230: 24-48 hours)
  - Severe injury? 72 hrs. recommended

Icing Methods

- Commercial hot/cold packs
- Ice bags (1part alcohol, 3 parts water)
- Ice cups
- Frozen vegetables
- Cold, wet towels from the freezer
- Snow
- Contrast baths (1 min. cold, 4 min. warm: variable)

Caution With Ice

- Frostbite
- Do not ice posterior knee (nerve damage)
- Raynaud's syndrome

Compression

- Fill hollow areas with padding
- Wrap towards the heart
  - –Loosen at night

Elevation

- Controls swelling and pain
- Elevate first 72 hours

Using Heat for Injuries

- 48-72 hours after injury (variable)
- Vasodilation