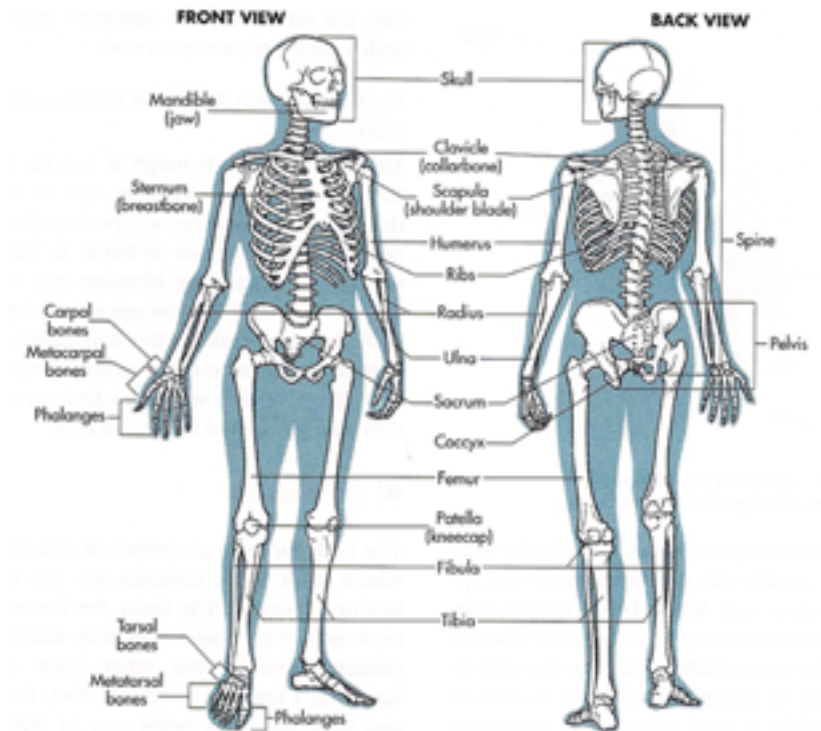
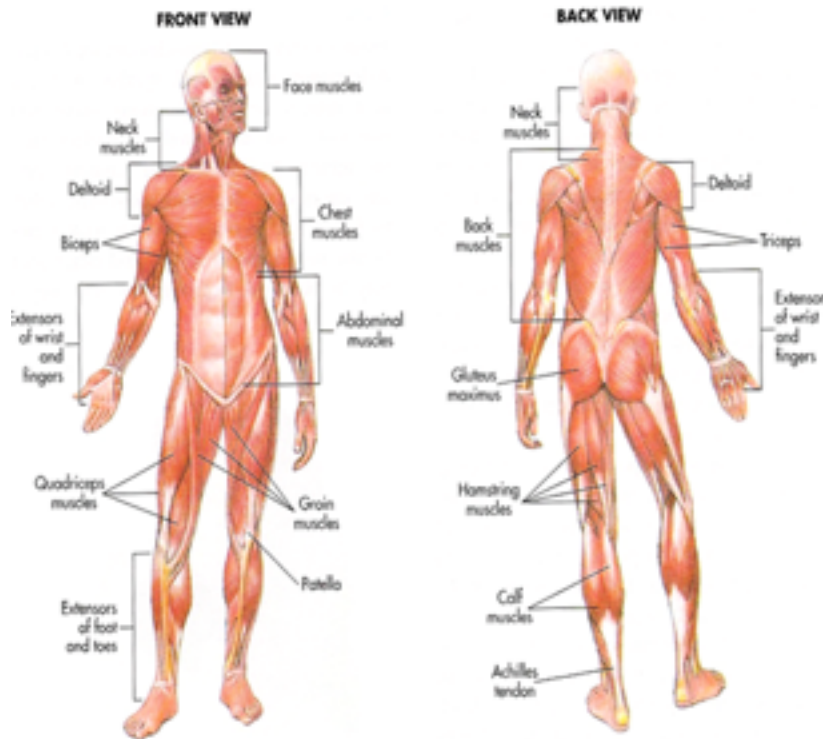


Injuries to Muscles, Bones and Joints



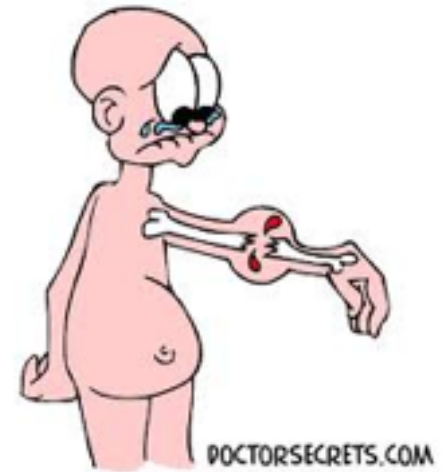
You Are the Emergency Medical Responder

You are patrolling the state park where you are the emergency medical responder (EMR) on duty. You come across two hikers walking on the trail; one appears to be assisted by the other. As you approach, you notice that the hiker that is being assisted is not putting any weight on the right leg.

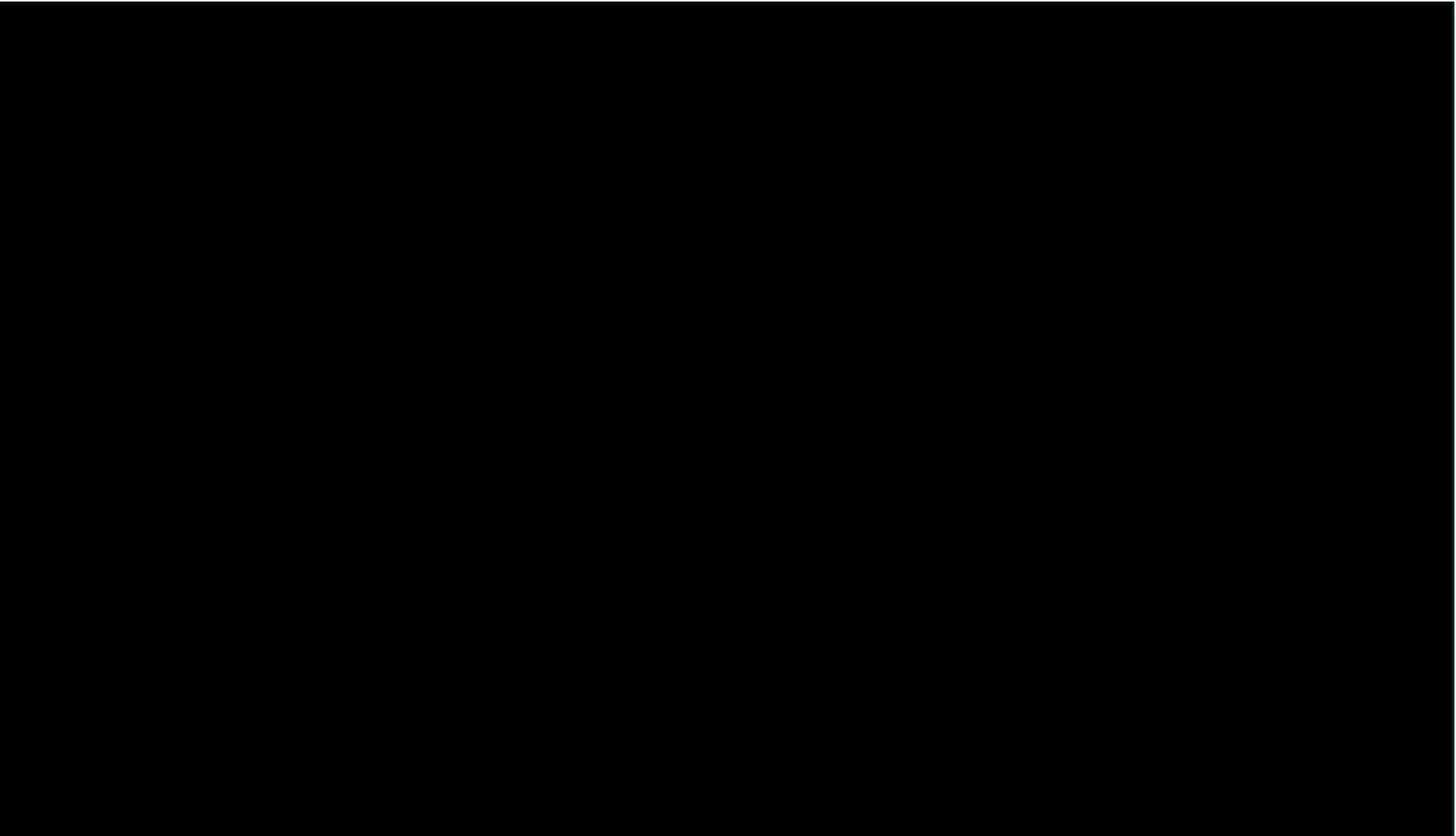
How would you respond?

Musculoskeletal System

- Bones, muscles, tendons, and ligaments
 - 206 bones
 - Muscles
 - Voluntary – skeletal, make up movement
 - Smooth – walls of organs
 - Cardiac – heart
 - Tendons
 - Connect muscle to bone
 - Ligaments
 - Hold bones at a joint together



DVD



Mechanisms of Injury

- Direct force



Injury at point of impact

- Indirect force



Energy transmitted some distance away

- Twisting force



Rotational forces
one part remains still,
rest of the body rotates

Types of Injuries

- Fracture

Break or damage to the bone. Closed or open



- Dislocation

Bones at a joint separated from normal position



- Sprains

Partial/complete tearing or stretching of ligaments



- Strains

Excessive stretching or tearing of muscles or tendons





















Assessing Signs and Symptoms of Injuries to Muscles, Bones and Joints

- Identified during physical examinations
- Consider how the body normally looks and feels
- Check for deformity, compare with uninjured side
- Ask patient how the injury occurred
- Ask patient if there are areas of pain
- Keep in mind the force that was required; there might also be internal injuries, bleeding and shock

Common Signs and Symptoms

- Snapping sound
- Deformity or angulation
- Pain and tenderness
- Crepitus – grating of bones
- Swelling
- Restricted movement
- Visible break
- Bruising or discoloration
- Loss of circulation or sensation



Providing Care for Injuries to Muscles, Bones and Joints

- Follow standard precautions - BSI
- Gentle, reassuring approach
- Avoid any movements or changes in position that cause pain
- Keep stable in position found
- Ensure effective breathing and administer emergency oxygen, if needed
- Control bleeding if present
- Stabilize the head, neck and spine; keep patient flat if a spinal injury suspected

Providing Care for Injuries to Muscles, Bones and Joints (cont'd)

- Remove any jewelry or restrictive clothing in the affected area
- Clean and bandage any open wounds before splinting
- Immobilize with splints only for transport and if possible to splint without causing more pain
- Check for circulation and sensation to the limb (before and after splinting)

Call more Advanced Medical Personnel if:

- You suspect a fracture to an area other than a finger or toe.
- The injury involves severe bleeding or impairs walking or breathing.
- The injury involves the head, neck or spine.
- You see or suspect multiple injuries.

Providing Care With “RICE”

- **Rest** – avoid movements that cause pain
- **Immobilize** – stabilize (in the position found)
- **Cold** – 20 minutes on/off
- **Elevate** – above level of heart is possible



Activity

You are called to the scene of an emergency involving an older woman who was attempting to cross the street when she slipped on the ice and fell. She tells you that she thinks she “twisted her right ankle because she heard a cracking sound when she fell.” You notice that the right ankle is visibly more swollen than the left and the patient complains of intense pain and tenderness when you touch the area. When the patient moves her ankle, you hear a grating sound. The patient also mentions that her toes feel like they are asleep.

What findings would lead you to suspect that the patient has a fracture?

Splinting

Rules for Splinting

- Splint only for moving or transporting patient to receive medical care (and you can do so without causing more pain)
- Assess circulation, temperature and sensation before splinting; continue to assess every 15 minutes after the splint has been applied
- Immobilize above and below the injury if a fracture is suspected
- Cut off or remove any clothing around the injury site
- Cover any bleeding or open wounds

Rules for Splinting (cont'd)

- Do not try to push protruding bones back below the skin
- Do not attempt to straighten an angulated fracture; always splint the limb in the position found
- Do not allow patient to bear weight on an injured lower extremity
- Pad the splints
- Secure the splint
- Elevate the splinted part, if possible

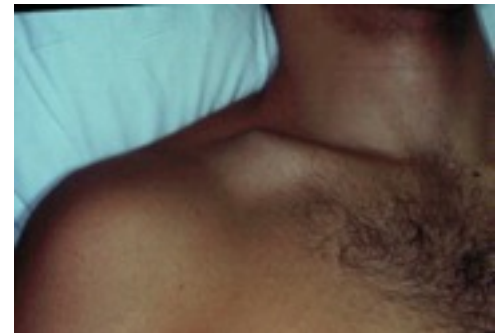
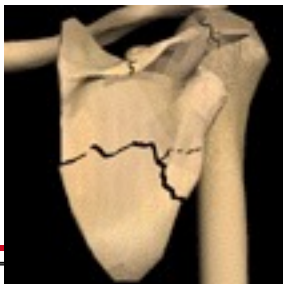
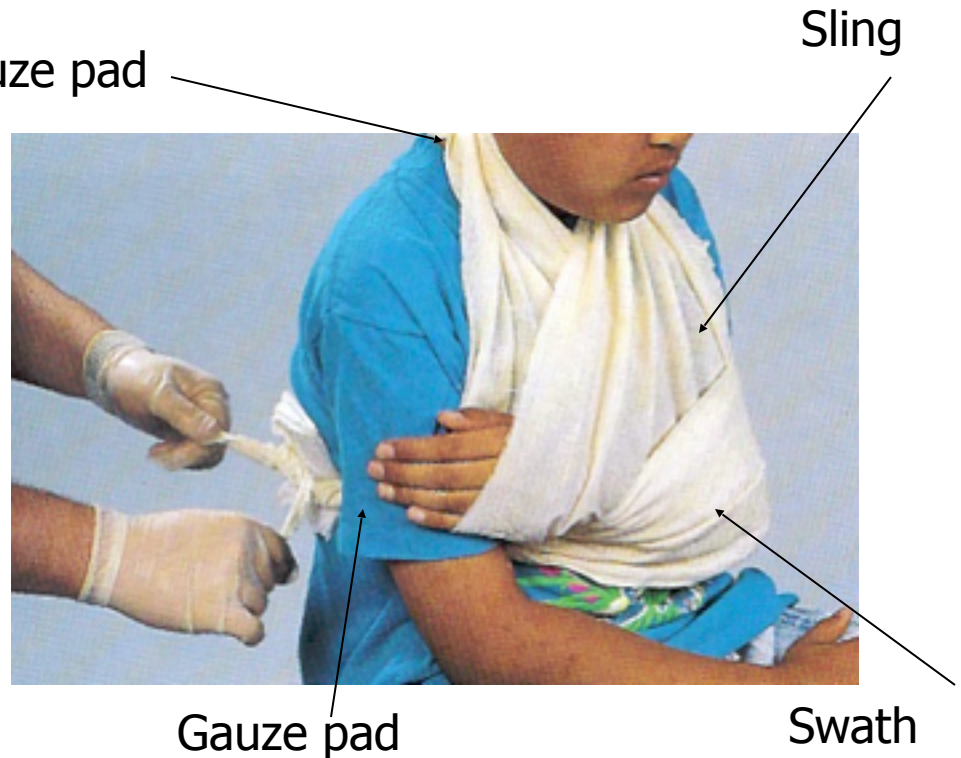
Types of Splints

- Soft
- Rigid
- Traction
- Circumferential
- Vacuum
- Anatomic (self-splint)



Shoulder Injuries

- Clavicle is most frequently injured shoulder bone
- Scapula fractures are rare
- A sling and binder are usually effective means to immobilization
- Check and recheck circulation, apply cold, and minimize shock



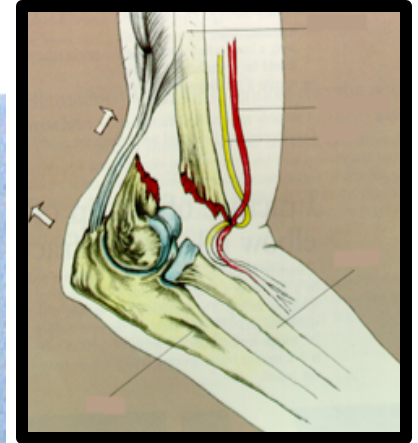
Upper Arm Injuries

- Humerus is the longest bone and is usually fractured at the upper (proximal) end.
- Control external bleeding and immobilize the upper arm from the shoulder to elbow.
- If possible, place arm in a sling and bind it to the chest.
- Check circulation before and after splinting.
- Apply ice and minimize shock.



Care for Elbow Injuries

- Injury to this area can be made worse by movement.
- If arm is straight, immobilize in this position with a splint and secure it to the body
- If the arm is bent, apply a splint diagonally across the inside of the arm.
- Check circulation before and after splinting.
- Apply cold, and care for shock



Forearm, Wrist, and Hand Injuries

- Bandage a hand using a figure-eight pattern
- To immobilize
 - Place roll of gauze in hand (Position of Function)
 - Place rigid support under the forearm
 - Put arm in a sling and elevate
 - Secure to the chest
 - Check circulation before and after splinting
 - Apply ice and minimize shock



Splinting Lower Extremities

- Pelvis – potentially life-threatening due to internal bleeding
- Hip – same as pelvis, long backboard, vacuum splint
- Femur – shorter leg; traction splint, rigid splints
- Knee – bent or straight
- Tibia and Fibula – circumferential air splint; rigid
- Ankle and foot – immobilize the foot and ankle

You Are the Emergency Medical Responder

After approaching the hikers, you find out that they were attempting to jump from rock to rock when one landed in an awkward position and could no longer put weight on the right leg without much pain. You are close to the entrance to the park but must move the injured hiker off of the trail in order for emergency medical services (EMS) personnel to take over care.

Skill Sessions

- Applying a Rigid Splint
- Applying a Sling and Binder
- Applying an Anatomic Splint
- Applying a Soft Splint