Chapter 22 Musculoskeletal Trauma

Musculoskeletal Injuries
- Millions of Americans experience annually.
- Multiple ____________________________________
  - Falls, Crashes, Violence, etc
  - _________________ trauma

Up to _____________ percent of patients who suffer multi-system trauma experience significant musculoskeletal injuries.

Musculoskeletal System
- Give the body its ________________________________ form
- Protect vital organs
- Promote efficient ________________________________ despite the forces of gravity
- Store __________________________ and other materials needed for metabolism
- Produce red blood cells

Bone Structure (1 of 2)
- ________________: hollow shaft found in long bones
- ________________
  - End of a long bone
- ________________
  - Between epiphysis and diaphysis
  - Growth plate

Bone Structure (2 of 2)
- _______________________ canal
  - Contains bone marrow
- Periosteum
  - Fibrous covering of diaphysis
- ______________________
  - Connective tissue that provides a smooth articulation surface for other bones

Joint Structure (1 of 3)
- Joint: Where bones interact
- Synarthrosis: A joint that does not permit ____________________
- Diarthrosis (____________________ joints)
  - Monaxial: hinge or pivot joints
  - Biaxial: gliding, sliding, or saddle joints
  - ______________________: ball and socket joints
- Ligaments
- Joint capsule
Skeletal Organization

- _______ bones
- __________________ skeleton
  - Head, thorax, and spine
- __________________ skeleton
  - Upper extremities
  - Lower extremities

Bone Aging

- Birth to adult (18–20)
  - Transition from flexible to __________________________ bone
- Adult to elderly (40+)
  - Reduction in ______________________ matrix and calcium salts
  - Diminution of bone strength
  - Spinal __________________________

Muscles

Types of muscles:

- ________________________________
- Striated
- ________________________________
  - ______ muscle groups make up the muscular tissue and structure

Joint Injuries

- ____________________________: a partial, temporary dislocation resulting in tearing of a joint capsule’s connective tissues; usually ligaments
- ____________________________: a partial displacement of a bone end from its position in a joint capsule reducing the joint integrity
- ____________________________: Complete displacement of a bone end from its position in a joint capsule

Bone Injuries

- Open Fracture: bone ends or the forces that caused it penetrate the skin
- ____________________________ Fracture: bone ends do not penetrate the skin
- ____________________________ Fracture: small crack in a bone
- Impacted Fracture: bone is __________________________ on itself

Types of Fractures (1 of 3)

- ____________________________ Fracture: runs perpendicular across the bone
- Oblique Fracture: runs across a bone at an angle other than 90°
Fracture: bone is broken into several pieces
Fracture: a curving break normally caused by rotation forces

Types of Fractures (2 of 3)

● Fracture: break in a bone associated with prolonged or repeated stress
● Greenstick Fracture: partial fracture in a child’s bone
● Fracture: disruption of the growth plate in a child’s bone

Types of Fractures (3 of 3)

Special Considerations

● Pediatric Considerations
  – ___________________________ nature makes deformity less likely
● Geriatric Considerations
  – ___________________________ : weakening of bone tissue due to loss of essential minerals, normally calcium
● Pathological Fractures
  – ___________________________ diseases such as cancer can weaken bones

Other Considerations

● ___________________________ compromise: damage to nerves
● Decreased ___________________________
● Muscle ___________________________

Bone Repair Cycle

● Blood fills the injured area and begins to clot
● ___________________________ produce osteoblasts
● Osteoblasts begin to lay down ___________________________ crystals within the clots
● New bone is formed rather than the formation of ___________________________ tissue

Inflammatory & Degenerative Conditions

● ___________________________ : acute or chronic inflammation of the small synovial sacs
● ___________________________ : Inflammation of a tendon
● ___________________________ : inflammation of a joint

Types of Arthritis

● ___________________________ : inflammation of a joint resulting from wearing of the articular cartilage
● ___________________________ Arthritis: chronic disease that causes deterioration of peripheral joint connective tissue
● ___________________________ : Inflammation of joints produced by
accumulation of uric acid crystals

23 Because there is limited soft tissue surrounding joints, injuries there may cause severe problems beyond the direct injury because blood vessels and ______________________ may be affected.

24 Musculoskeletal Injury Assessment (1 of 4)
Scene Size-Up:
- ______________________ to specific injuries.
- Pelvic fractures or bilateral femur fractures are “____________________ and go.”
- Control major ______________________ .
- History may suggest other injuries.

25 Musculoskeletal Injury Assessment (2 of 4)
Primary Assessment: ABCs, plus ______________________
Categories of urgency:
- Life & Limb threatening injury
- Life threatening injury and minor musculoskeletal injury
- Non-life threatening injuries but ______________________ musculoskeletal injuries
- Non-life threatening injuries and only ______________________ minor musculoskeletal injuries

26 Musculoskeletal Injury Assessment (3 of 4)
- Rapid Trauma Assessment (Scan)? Or Focused exam??
  - Only press on ______________________ if no clinical signs of injury are present, such as pain.
  - Use ______________________
- History and Physical Exam
  - Use DCAP-BTLS

27 Musculoskeletal Injury Assessment (4 of 4)
Reassessment:
- Continuously check for distal pulse and ______________________ status
- Check for ______________________ which could tighten splint and impede circulation
- Check for ______________________

28 6 P’s of Extremity Evaluation
- ______________________
- Pallor (skin color)
- Paralysis (inability to move extremity)
- ______________________ (numbness)
- ______________________ (BP and swelling)
Musculoskeletal Injury Management Principles

- Protect ___________________________ Wounds
- Position the limb
  - Fractures should be ___________________________ unless severe pain is caused or resistance is met
  - Dislocations and fractures within ___________” of a joint should be immobilized in position found
- Immobilize the injury
- Check Neurovascular Function before AND ___________________________ immobilization

Splinting Devices

- ___________________________ splints
- Formable Splints: ladder splints, SAM splint
- Soft Splints: air splints, PASG
- ___________________________ Splints
- Other Splinting Aids
  - ___________________________ Splints
  - Cravats or Velcro Splints

Musculoskeletal Injury Management

Fracture Care:
- Immobilize the injury from the ___________________________ above and below fracture site
Joint Injury Care:
- Immobilize the injury from the ___________________________ above and below joint injury

Care for Specific Fractures (1 of 3)

Pelvis:
- Scoop Stretcher or ___________________________
- PASG
- ___________________________ Resuscitation
Femur:
- ___________________________ Splint unless knee is involved
- PASG
- Fracture versus ___________________________ dislocation

Care for Specific Fractures (2 of 3)

Tibia/Fibula:
- Rigid or soft splint
- Traction splint ___________________________ traction
Clavicle:
- Most frequently fractured bone in the body
- Transmitted to 1st and 2nd ___________________________
• Be alert for ____________________________________ injury
• Sling and swathe

34 Care for Specific Fractures (3 of 3)
Humerus:
• Sling and swathe or __________________________ splint with sling and swathe
Radius/Ulna:
• __________________________ splint or rigid splint, sling and swathe

35 Care for Specific Joint Injuries (1 of 3)
Hip Injuries:
• Immobilize in __________________________ position
• Long board bind legs together with __________________________ between
• Scoop Stretcher
• PASG
Knee Injuries:
• Immobilize with rigid splints in position found
• Use of __________________________ , Air splint, or traction splint (w/o traction) if straight

36 Care for Specific Joint Injuries (2 of 3)
Ankle and Foot Injuries:
• __________________________ splint
• Rigid or air splint
Shoulder Injuries:
• Rigid splints if dislocated __________________________
• Sling and swathe if dislocated __________________________ (pad between arm and chest)

37 Care for Specific Joint Injuries (3 of 3)
Elbow Injuries:
• Sling and Swathe if __________________________
• Use of Air splint or rigid splints if straight
Wrist/Hand Injuries:
• Use of rigid or air splint
• Sling and swathe
• Leave finger __________________________ exposed
Finger Injuries:
• Use __________________________ blades or small malleable splints

38 More on Knee and Elbow Injuries
• Immobilize knee and elbow injuries in the position found unless you discover significant distal __________________________, sensation, or motor deficit.
• If deficit, attempt to straighten __________________________. If resistance is felt or patient suffers severe, unbearable pain, immobilize as found and
transport rapidly

39 In all joint injuries, be alert for neurological and circulatory
__________

40 Key Management Aspects
  ● Don’t get “___________ vision”.
  ● Orthopedic injuries are rarely life threatening
  ● Care for ___________________________ first
  ● Always initiate an ______________________
    – TKO unless fluids are needed
    – Will facilitate the administration of analgesics