Health ONE EMS
Emergency Medical Services

Musculoskeletal Injuries

Musculoskeletal System

Anatomy & Physiology

- Bones provide framework
- Joints allow for bending
- Muscles allow for movement
- Cartilage provides flexibility
- Tendons connect muscle to bone
- Ligaments connect bone to bone

Types of Muscle

- Smooth (involuntary)
  - Found in organ walls & digestive system
- Cardiac (myocardium)
  - Found in walls of the heart
- Skeletal (voluntary)

Voluntary (Skeletal) Muscle

- Attaches to the bones
- Forms the major muscle mass of the body
- Responsible for movement
- Under conscious control
- Gives the body shape

Injuries to Bones

Types of Musculoskeletal Injuries

- Fracture

- Bones break

- Dislocation
  - Joints “come apart”

- Sprain
  - Stretching & tearing of ligaments

- Strain
  - Overexertion of muscle

Types of Musculoskeletal Injuries

All musculoskeletal injuries may present with the same symptoms & signs; care is directed at minimizing injury, not determining which type!

Signs & Symptoms of Musculoskeletal Injuries

- Pain and tenderness
- Deformity or angulation
- Grating (crepitus)
- Swelling
- Bruising (discoloration)
- Exposed bone ends
- Joint locked in position
- Nerve/blood vessel compromise

Emergency Care of Musculoskeletal Injuries

- BSI
- Oxygen, if indicated
- Apply cervical collar as needed
- After control of life threats, splint injuries
- Cold pack/elevate

Splinting

Splinting prevents motion of:

- Bone fragments
- Bone ends
- Angulated joints

Splinting minimizes:

- Damage to muscles, nerves, blood vessels
- Conversion of closed injury to open injury
- Restriction of blood flow
- Excessive bleeding
- Pain/paralysis

Splinting – General Rules

- Assess distal pulse, motor function, and sensation (PMS) before & after application
- Immobilize joints above & below injury
- Remove or cut away clothing
- Cover open wounds with sterile dressings
- Do not replace protruding bone ends
- Pad splint
- If the following:
  - Severe deformity
  - Cyanotic distal extremity
  - Pulseless distal extremity

Then align with gentle traction unless resistance is felt

- Splint patient before moving
- When in doubt, splint
- Care for ABCs and life threats first

Hazards of Improper Splinting

- Compression of nerves, tissues, and blood vessels
- Delays transport of critical

patients
- Reduced distal circulation from tight splints
- May aggravate or worsen initial injury (splint loose or excessive motion)

Pelvic Injury

- Pelvic fracture
- Hip dislocation
- Maintain strong suspicion of spinal injury

Treatment of Pelvic Injury

- Minimize motion of injured area
- Assess distal PMS
- Attempt to straighten lower extremities into anatomical position
- Pad between extremities with blanket
- Apply PASG if patient is hypotensive
- Place patient on spine board. (Use caution with log-roll!)
- Reassess distal PMS
- Care for shock
- Transport
- Pelvic wrap is an option
- Perform patient assessment
- Treat for shock
- When correctly placed, sheet will appear lower than iliac “wings”

Traction Splinting

Use a traction splint to immobilize a painful, swollen, or deformed thigh with no joint or lower leg pain

Contraindications

- Injury to:
  - Knee or nearby area
  - Hip (proximal femur)
  - Pelvis
  - Lower leg; or
  - Avulsion or partial amputation of lower leg

Review Questions

- List signs and symptoms of musculoskeletal injuries.
- What complications will you prevent by splinting properly?
- What must you assess before and after applying a splint?
- When should you use traction while splinting an extremity?
- When should you use a traction splint?

Street Scenes

- What priority would you assign to this patient? Why?
- How would you continue your assessment?
- What signs might you expect to find with a broken long bone?
- What are your major concerns with possible broken bones in the extremities?
- What interventions are appropriate for this patient?