Musculoskeletal Trauma

McHenry Western Lake County EMS
Fall CE 2021- Learning Packet
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• **Musculoskeletal Disorders** are injuries and disorders that affect the human body's movement or musculoskeletal system (i.e. muscles, tendons, ligaments, nerves, discs, blood vessels, etc.). Common musculoskeletal disorders include: Carpal Tunnel Syndrome. Tendonitis.

• **Musculoskeletal pain** affects bones, joints, ligaments, tendons or muscles. An injury such as a fracture may cause sudden, severe pain.
The most common orthopedic disorders include:

- Tendonitis. This is an inflammation of a tendon – the fibrous tissues that connect a muscle to a bone. ...
- Osteoarthritis. ...
- Rheumatoid Arthritis. ...
- **Bone Fractures** ...
- Carpal Tunnel Syndrome. ...
- Fibromyalgia.
- Strains
- Sprains
A **Strain** is the stretching or tearing of a muscle or a tissue connecting muscle to bone (tendon). Strains often occur in the lower back and in the muscle in the back of the thigh.

Symptoms include pain, swelling, muscle spasms, and limited ability to move the muscle.

Treatment may include pain relievers, ice, or splinting.
A sprain is a stretching or tearing of ligaments.
A **sprain** is a stretching or tearing of ligaments

- The tough bands of fibrous tissue that connect two bones together in your joints. The most common location for a **sprain** is in your ankle. Initial treatment includes rest, ice, compression and elevation.
- Mild **sprains** can be successfully treated at home
How do you know if pain is muscular or skeletal?

**Muscular** - Trauma typically results in weakness, impaired function, instability, or loss of coordination.

**Skeletal** (Joint or bone) - Joint pain typically occurs during weight bearing activities, sudden movements, or sustained inactivity. Pain can be sharp, dull, pressure, or throbbing.

- **Rest** - Rest is very important for soft tissue injuries, both in the short term and for longer term care. Immobilize - Sprains, strains and dislocations can be slinged; fractures should be splinted and slinged.

- **Rest** - Rest and protect the injured or sore area. Stop, change, or take a break from any activity that may be causing your pain or soreness.

- **Ice** - Cold will reduce pain and swelling. Apply an ice or cold pack right away to prevent or minimize swelling. Apply the ice or cold pack for 10 to 20 minutes, 3 or more times a day. After 48 to 72 hours, if swelling is gone, apply heat to the area that hurts. Do not apply ice or heat directly to the skin. Place a towel over the cold or heat pack before applying it to the skin.

- **Compression** - Compression, or wrapping the injured or sore area with an elastic bandage (such as an Ace wrap), will help decrease swelling. Don't wrap it too tightly, because this can cause more swelling below the affected area. Loosen the bandage if it gets too tight. Signs that the bandage is too tight include numbness, tingling, increased pain, coolness, or swelling in the area below the bandage. Talk to your doctor if you think you need to use a wrap for longer than 48 to 72 hours; a more serious problem may be present.

- **Elevation** - Elevate the injured or sore area on pillows while applying ice and anytime you are sitting or lying down. Try to keep the area at or above the level of your heart to help minimize swelling.
1. ITC special considerations:

§ Assess pain, paralysis/paresis, paresthesias, pulses, pressure & pallor before & after splinting.

Assess for deformity, shortening, rotation, or instability.

§ Analgesia before moving/splinting: Hemodynamically stable, isolated MS trauma, no contraindications (drug allergy, AMS):
  - Rx per Pain Mgt. SOP (pg 5)

  - Severe muscle spasm: Analgesia as above and/or: MIDAZOLAM (anxiety dosing)

  - Meets TC I or II criteria: On scene care restricted to hemorrhage control, airway access, selective spine precautions if needed, & O2 delivery. Attempt all other interventions enroute.

2. Gently attempt to align long-bone fx unless open; resistance to movement; extreme pain, or involves a joint

3. Immobilize/splint per procedure; If pulses lost after applying traction splint: Do not release traction. Notify OLMC.

4. Acute injury: Apply cold pack over injury site and elevate extremity after splinting unless contraindicated

5. Crush Syndrome-CRITICAL, assess for Hyperkalemia. Looked for Peaked T waves in the EKG w/ shortened QT to flattened or absent P waves, prolonged PRI, wide QRS. If present: Sodium Bicarbonate 50mEq slow IVP over 5 min followed by 20mL NS IV flush. If no IV: Albuterol 5 mg continuous neb up to 20 mg throughout transport.
• So what is a Crush injury?

• A crush injury occurs when force or pressure is put on a body part. This type of injury most often happens when part of the body is squeezed between two heavy objects.
Crush Injury/Syndrome

- Crush syndrome (also traumatic rhabdomyolysis or Bywaters’ syndrome) is a medical condition characterized by major shock and kidney failure after a crushing injury to skeletal muscle.
- Crush syndrome predominantly affects the kidneys leading to renal failure, but the clinical picture may include acute respiratory distress syndrome, disseminated intravascular coagulation, hypovolemic shock, arrhythmias and psychological trauma.
Compartment Syndrome

• Compartment syndrome is a painful condition that occurs when pressure within the muscles builds to dangerous levels. This pressure can decrease blood flow, which prevents nourishment and oxygen from reaching nerve and muscle cells.

• Compartment syndrome develops when swelling or bleeding occurs within a compartment. Because the fascia does not stretch, this can cause increased pressure on the capillaries, nerves, and muscles in the compartment. Blood flow to muscle and nerve cells is disrupted. Without a steady supply of oxygen and nutrients, nerve and muscle cells can be damaged.
Acute Compartment Syndrome usually develops after a severe injury, such as a car crash or breaking a bone. Rarely, it develops after a relatively minor injury.

Conditions that may bring on acute compartment syndrome include:

1) A fracture.

2) A badly bruised muscle

3) Reestablished blood flow after blocked circulation.
   This may occur after a surgeon repairs a damaged blood vessel that has been blocked for several hours. A blood vessel can also be blocked during sleep. Lying for too long in a position that blocks a blood vessel, then moving or waking up can cause this condition.

4) Crush injuries.

5) Constricting bandages. Casts and tight bandages may lead to compartment syndrome. If symptoms of compartment syndrome develop, remove or loosen any constricting bandages.
Acute Compartment Syndrome

- The classic sign of acute compartment syndrome is pain, especially when the muscle within the compartment is stretched.
- The pain is more intense than what would be expected from the injury itself. Using or stretching the involved muscles increases the pain.
- There may also be tingling or burning sensations (paresthesias) in the skin.
- The muscle may feel tight or full.
- Numbness or paralysis are late signs of compartment syndrome. They usually indicate permanent tissue injury.
- A 6th P is Poikilothermia (differing temperatures between limbs with affected side being cooler).
Amputations/
Degloving
Amputation

Amputation is the removal of a limb by a medical illness, a traumatic event, or surgery.
Degloving Injury
AMPUTATION / DEGLOVING INJURIES:

- Save life over limb. If infield amputation needed call OLMC.
- Transport amputations above the wrist or ankle to a replantation center if ground transport times are ≤30 minutes.
- Amputation incomplete or uncontrolled bleeding: Hemorrhage control per ITC; splint as necessary.

6. Care of amputated parts:

- Attempt to locate all severed parts. Remove gross debris but NOT tissue; do not irrigate.
- Wrap in saline-moistened (not wet) gauze, towel, or sheet. Do NOT immerse in fluid.
- Place in water-proof container and seal. Surround w/ cold packs or place in second container filled w/ ice/cold water. Avoid overcooling or freezing the tissue. Note time cooling of part began.
Musculoskeletal Trauma Review

This concludes the Review
Please complete the Learning Assessment to earn CE Credit.

Thank You
Credit’s


• https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4919827/
• www.medicine.net

• https://orthoinfo.aaos.org/en/diseases--conditions/compartment-syndrome/