Volume 3, Issue 5, May 2025 ISSN (E): 2938-3765

INJURIES THAT OCCUR IN THE MUSCULOSKLETAL SYSTEM IN AN EMERGENCY AND PROVIDE THEM WITH MEDICAL CARE IN THE PRE-HOSPITAL PERIOD

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Abstract
Injuries to muscles, joints, and bones are some of the most common emergencies you will encounter in the field. They can range from simple and non-life-threatening injuries (such as a broken finger or sprained ankle) to critical and life-threatening injuries (such as a fracture of the femur or spine). Regardless of whether the injury is mild or severe, your ability to provide emergency care efficiently and quickly can prevent further painful and damaging injury and might even keep the patient from suffering permanent disability or death.

Keywords: musculoskletal injuries, flexion, adduction, extension, rotation, fractures, paresthesia

Introduction

The two main parts of the musculoskeletal system, as is obvious from its name, are the muscles and the skeleton. The skeletal system supports the body, allowing it to stand erect. Without its bones, the body would collapse. As the body's structural frame work, the skeleton must be strong to provide support and protection, jointed to permit motion, and flexible to withstand stress. A major element in motion is the body's joints, or places where bones meet. Joints allow for several different types of motion:

Flexion: this bending motion moves the extremity toward the body.

Extension: this bending motion moves the extremity away from the body.

Adduction: this is a movement of a body part toward the midline of the body. Abduction: this is a movement of a body part away from the midline of the body. Rotation: this movement turns the body along the axis of a bone or joint. Circumduction: this is a movement through an arc of a circle or in a circular motion from a central point.

Several kinds of musculoskletal injuries are possible. The first to come to mind is a fracture or, simply, a broken bone. Although many of the signs and symptoms are similar, the injury might not involve a fracture but might be a strain, sprain, or dislocation.

A fracture is a breaking the continuity of a bone. Fractures occur from a variety of mechanisms of injury, including direct force, indirect force, and twisting force. These forces are discussed later in the section. A fracture is generally categorized as open or closed. An open fracture is a fracture with an associated open wound. The open wound might be caused by the bone end punching

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through the muscle, soft tissue, and skin, or it might be caused by the force that caused the fracture, such as a bullet. If there is no break in the skin, it is considered to be a closed fracture. An open fracture is additionally complicated by the introduction of bacteria and other contaminants that can lead to infection. If the bones become displaced, there might be dam age to surrounding nerves, blood vessels, muscles, ligaments, and tendons.

Signs and symptoms of a fracture can include: pain, tenderness, deformity, discoloration, paresthesia distal to the fracture site (tingling or abnormal sensation; can indicate nerve injury); Anesthesia distal to the fracture site (loss of feeling; can indicate nerve injury); Paresis (weakness; can indicate nerve injury); Paralysis (loss of muscle control; can indicate nerve injury); Inability to move the extremity (can indicate muscle or tendon damage); Decreased pulse amplitude, increased capillary refill time, paresthesia, or pale, cool skin distal to the fracture site (can indicate vessel injury).

A hairline fracture is a small crack in the bone that doesn't create instability. The patient might present with only pain and tenderness. Complications that can result from a fracture include hemorrhage from the bone itself; instability of the extremity, leading to an increased incidence of tissue, nerve, or vessel damage; surrounding tissue damage; infection associated with an open fracture; and interruption of distal blood supply. Geriatric patients are especially prone to fractures because of changes in their bone structure. After 40years of age, bones start to become less flexible, more brittle, and more easily fractured. Osteoporosis is a degenerative bone disorder associated with an accelerated loss of minerals, primarily calcium, from the bone. This condition dramatically weakens the bones and makes them susceptible to fracture. Osteoporosis typically affects women more than men and occurs most often after menopause.

A strain is an injury to a muscle or a muscle and tendon, possibly caused by overextension, or overstretching. Overstretching tears muscle fibers and causes pain that typically increases with the muscle use. A strain can also occur as a result of extreme muscle stress or fatigue associated with overuse. Because there is no bleeding, the injury does not present with edema or discoloration. Typically, the patient complains of pain on palpation, usually localized to a specific site, and pain or weakness with use of the muscle.

A sprain is an injury to a joint capsule, with damage to or tearing of the connective tissue, and usually involves ligaments. The shoulder, knee, wrist, and ankle are the joints most vulnerable to sprains. The patient typically experiences immediate pain and tenderness at the joint upon injury. The joint then becomes inflamed and swollen. Discoloration usually occurs over time but not for several hours after the injury.

A dislocation is the displacement of a bone from its normal position in a joint. The joint is found in an abnormal position with obvious deformity and usually swelling. The patient complains of pain and tenderness at the site of dislocation and typically is unable to move the extremity. A dislocation is dangerous because it can damage blood vessels and nerves by compression or tearing. A dislocation usually occurs from the joint being forced well beyond its normal range of motion; thus, the patient is likely to also have ligament or joint capsule injury. Dislocations are often found in association with fractures.

In some cases, the bone injury is the chief complaint. If the patient has a life-threatening condition caused by or directly related to the extremity injury, such as a femur or pelvic fracture with

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hypotension or an open fracture with severe bleeding, immobilize the injured extremity during your primary or secondary assessment if the appropriate resources are available and it does not cause a delay in transport of the patient, and transport immediately. If the patient has a life-threatening condition not directly related to the extremity injury (e.g., intraabdominal trauma), initiate transport immediately and immobilize the extremity enroute if time and critical patient care permit. Perform the following steps to immobilize a suspected fracture after the primary assessment has been completed:

1. Assess for and control any major bleeding.
2. Take the necessary spine motion restriction precautions if spinal injury is suspected.
3. Assess and maintain adequate oxygenation. If the patient exhibits any signs of poor perfusion or shock, or if the SpO2 is less than 95 percent on the initial reading or at any time falls below 95 percent in the trauma patient, supplemental oxygen should be administered to establish and maintain an SpO2 of greater than 95percent. Oxygen should be administered via a nonrebreather mask at 10–15 lpm to achieve and maintain the SpO2 of more than 95percent in the trauma patient.
4. Splint bone and joint injuries. Check the patient's distal pulses, motor function, and sensation both before and after splinting. Document your findings in the prehospital care report. Specifics on splinting are detailed in the next section.
5. Apply cold packs to suspected fractures and dislocations to reduce pain and swelling.
6. Elevate the extremity if possible and if it doesn't inter fere with spine motion restriction precautions. Keep it elevated throughout transport.

All in all, a fracture is a break in the continuity of the bone. Some fractures present with obvious signs and symptoms, whereas others have a subtler presentation. Fractures can be open or closed. Other associated injuries are dislocations, sprains, and strains. The two main purposes of splinting are to prevent movement and reduce pain. When splinting a joint, be sure to immobilize the bone above and below the joint. When splinting a long bone, you must immobilize the joint above and below the injured bone. Always assess motor and sensory function and distal pulses prior to and after splinting an extremity. There are a variety of splints, including rigid, pressure (air or pneumatic), traction, vacuum, improvised, and sling and swathe. Select the proper splint for the injury. Improperly applied splints can aggravate or cause further injury.

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