# Orthopaedic Injuries: Fractures, Sprains and Strains

Injuries and falls on school grounds are common. Anytime a child falls or is injured, an orthopaedic (bone or joint) injury is possible. In giving first aid or emergency treatment, you must always look for signs of fractures (broken bones), dislocations, sprains, strains and contusions.

## FRACTURES

Fractures are usually very painful injuries and an X-ray is required to make the diagnosis. Other symptoms include:

- Swelling
- Bruising
- Deformity (limb appears out of place)
- Numbness or tingling
- Broken skin with bone visible
- Limited mobility of the extremity
- Nausea

If there is an open wound with bone visible, signs of shock or the foot or hand at the end of the injured extremity is cold or blue, call 911 immediately. Cover any open wound with a clean dressing. First aid for a suspected fracture should be to immobilize the extremity to prevent pain and further injury. Do not straighten the extremity or change its position if it is deformed. Splints should be lightweight, strong, fairly rigid but well-padded and long enough to reach above and below the joints on both sides of the injured area. Emergency splints can be made with a rolled up towel, magazine or piece of wood. Use tape, gauze or cloth to secure it to the injured extremity, maintaining enough room to put a few fingers between the splint and the injured body part. Injuries also can be splinted by holding the arm against the child's chest or wrapping the injured leg against the other leg.

Parents should be notified and emergency care sought as soon as possible. Ice also can be applied using a frozen sponge in a plastic bag or a frozen gel pack. Always put a layer of cloth or another barrier between the ice and the child's skin. Leave the ice on for 15 to 20 minutes then remove for 15 minutes before reapplying. Check circulation every 10 to 15 minutes by comparing the color and temperature of the injured extremity to the uninjured side. Check sensation by asking the child to respond to a light touch, saying where he feels it. Check motion by having the child wiggle his fingers or toes if this does not cause pain. Anti-inflammatory medications, such as ibuprofen or acetaminophen, will help with pain. With open injuries or severe injuries, do not allow the child to eat or drink, as surgery may be necessary.

## SPRAINS AND STRAINS

Sprains occur when the ligaments, which hold bones together, are overstretched and partially torn. A strain is an injury to a muscle or tendon (elastic cord that attaches muscle to bone). Sprains and strains generally cause swelling, pain and sometimes bruising around the injured area. It is difficult to tell whether an injury has resulted in a fracture, sprain or strain without a medical exam and often an X-ray.

First aid for sprains and strains can be remembered with the word PRICE: protect, rest, ice, compression and elevation.

**Protect**—A splint or elastic bandage will help protect the injured area from further damage by limiting movement.

**Rest**—The child should be allowed to rest in a position of comfort. If the injury is to a lower extremity, do not allow the child to put weight on it.

**Ice**—Hold an ice pack on (or to the side of) the injured area with a layer of padding between the ice and the skin. Leave the ice on for 15 minutes and off for 15 minutes.

**Compression**—This may be provided by an elastic bandage applied from the hand toward the elbow or from the foot toward the knee. The wrap should not be too tight. Check frequently for decreased circulation—numbness, tingling or color changes—and loosen the bandages if these symptoms occur.

**Elevation**—This helps control swelling and pain. The injured part should be elevated above the level of the child's heart if possible. Parents should be called and follow-up with the child's healthcare provider should be recommended for definitive diagnosis and treatment.

## FRACTURES IN CHILDREN AND TEENS

Bones in children and teens are different from those in adults in many ways:

- Bones heal faster in young people. The younger the child, the faster healing occurs.
- Bones are softer in children and tend to buckle or bend rather than break.

In children and teens, bone growth happens at specific points called growth centers or growth plates. These points are near the ends of the long bones. The growth plate may be damaged by a fracture or another injury.

The Children's Healthcare of Atlanta Fracture Care Program offers care for all types of pediatric fractures, sprains and strains. Visit www.choa.org/fracture for more information.

**This general healthcare information should not be used as a substitute or in place of contacting your child's healthcare provider. Visit www.choa.org for more information.**