

Growth Plate Injuries

Overview, Symptoms, & Causes

[Diagnosis, Treatment, & Steps To Take](#)

[Research & Resources](#)

Overview of Growth Plate Injuries

The growth plate is the area of tissue near the ends of long bones in children and teens that determines the future length and shape of the mature bone. Each long bone has at least two growth plates, one at each end, and they are longer than they are wide. For example, the femur (thigh bone), radius and ulna (forearm), and the metacarpal bones (hands and fingers) are long bones. Once your child's growth is complete – sometime during adolescence – the growth plates close and are replaced by solid bone.

The growth plates are weak areas of your child's growing skeleton. Because they are even weaker than the nearby ligaments and tendons that connect bones to other bones and muscles, growth plates are vulnerable to injury. Injuries to the growth plate (fractures) can result from a single traumatic event, such as a fall or automobile accident, or from chronic stress and overuse.

Children and teens with growth plate injuries often need immediate treatment to prevent problems with bone growth. However, with proper treatment, most growth plate fractures heal without any lasting effect.

Who Gets Growth Plate Injuries?

Because the growth plate is the last area of bone to harden during growth, children and teens are vulnerable to growth plate fractures or injuries. A similar injury in an adult can cause a sprain.

The following factors may increase the chance that your child or teen may injure or fracture their growth plate:

- **Sex.** Growth plate fractures occur more often in boys than in girls. A girl's body matures at an earlier age than boys. As a result, girls' bones finish growing sooner, and the growth plate is replaced with stronger, solid bone at an earlier age.
- **Competitive sports.** Growth plate injuries often occur in children and teens who participate in competitive sports or activities that increase the risk to fall or be hit, such as:
 - Football.
 - Basketball.
 - Gymnastics.
 - Biking.
 - Sledding.
 - Skiing.
 - Skateboarding.
- **Repetitive use.** Specializing in one sport and overusing certain limbs or areas of the body before puberty finishes can lead to growth plate injuries.

Types of Growth Plate Injuries

Doctors use a classification system called the Salter-Harris to divide most growth plate injuries and fractures into five types. Understanding the anatomy of long bones can help you understand the types of growth plate injuries. Long bones have four major areas:

- **Epiphysis:** the end of the bone near the joint.

- **Physis:** the growth plate.
- **Metaphysis:** the area between the growth plate and the shaft.
- **Diaphysis:** the shaft of the long bone between growth plates above and below.

The Salter-Harris types are:

- **Type I** happens when the fracture passes through the physis but does not involve the area of bone around the growth plate.
- **Type II** happens when the fracture runs through the physis and the metaphysis. This is the most common type of growth plate fracture.
- **Type III** happens when fractures run through the epiphysis and growth plate. This leads to a separation of epiphysis and physis from the metaphysis.
- **Type IV** happens when fractures run through the physis, metaphysis, and epiphysis.
- **Type V** is a compression fracture through the physis that happens when the end of the bone is crushed, and the physis is compressed. This type of fracture is rare.

Sometimes, doctors include the Peterson classification when describing growth plate injuries. This system includes a type VI, which happens when a portion of the epiphysis, physis, and metaphysis are missing. This usually happens from a severe traumatic injury that includes open wounds or compound fractures.

Symptoms of Growth Plate Injuries

Symptoms of a growth plate injury include:

- Persistent pain and tenderness after a sudden or overuse injury.
- Deformity, warmth, or swelling at the end of a bone.
- Changes in how your child bends their limb.
- Inability to move, put pressure on, or bear weight on a limb because of pain.

You may notice that your child self-limits the amount of time playing after a prior injury.

Causes of Growth Plate Injuries

Growth plate injuries can happen for many reasons. A sudden accident can cause growth plate injuries. For example, your child may experience trauma to the limb from a blow or falling down, or they may experience such injuries from competitive sports or recreational activities.

Sometimes, growth plate injuries happen when your child overuses a certain part of the body. Young children who specialize in a sport or activity and spend long hours training can overuse a specific limb or area of their bodies, causing growth plate injuries. This may be seen in:

- Gymnasts who practice for hours.
- Long-distance runners.
- Baseball pitchers.

Although most growth plate injuries happen during play or athletic activity, growth plates are also susceptible to medical disorders that can alter their normal growth and development.