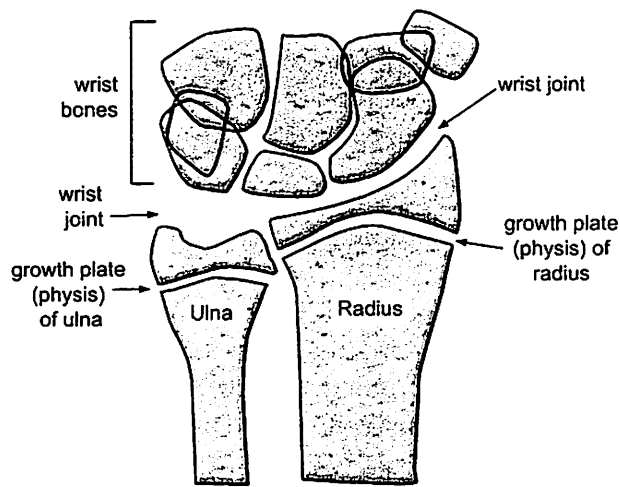


InfoSheet – Growth Plate Fractures

David M. Klein, MD – Kennedy-White Orthopaedic Center

WHAT IS A GROWTH PLATE FRACTURE?

A growth plate fracture is a partial or complete break in an area of young bone known as the *physis*. This area of developing cartilage is found on the ends of long bones in children and adolescents. For girls, the growth plate usually continues to develop new bone until puberty. In boys, the growth plate is often active until early adulthood. When growth stops, the plate (made of cartilage) is replaced by bone.



Growth Plates of the Wrist

HOW DO THEY OCCUR?

In adults, ligaments and tendons are more prone to injury than bones. In children and adolescents, the growth plates are the weakest areas of young bones and their adjacent joints. The strong ligaments and tendons near the plate can hold up to the stress of falls or blows, but a growth plate fractures under this pressure.

Overuse can also lead to this injury. Athletic activities that place repeated

and prolonged stress on the bones may contribute to a break. Poor body mechanics, improper technique, tired muscles, and using the wrong equipment increase the risk.

WHERE DO THEY OCCUR?

Growth plate fractures can occur in any long bone. The majority of these breaks happen in the wrist and ankles. Other common areas include the fingers, elbow and shoulder.

WHAT ARE THE SIGNS OF A GROWTH PLATE FRACTURE?

Symptoms of growth plate fractures include pain, swelling, and, in some cases, deformity. Severe 'sprains' in children are often growth plate fractures, because ligaments are usually stronger than the cartilage of the growth plate. Medical care should be sought immediately to limit permanent damage to the plate.

WHO IS AT RISK FOR A GROWTH PLATE FRACTURE?

All children and adolescents are at risk for these injuries. Approximately 75% of all growth plate fractures occur between the ages of 10 and 16. Boys tend to sustain growth plate fractures about 2 times more frequently than girls.

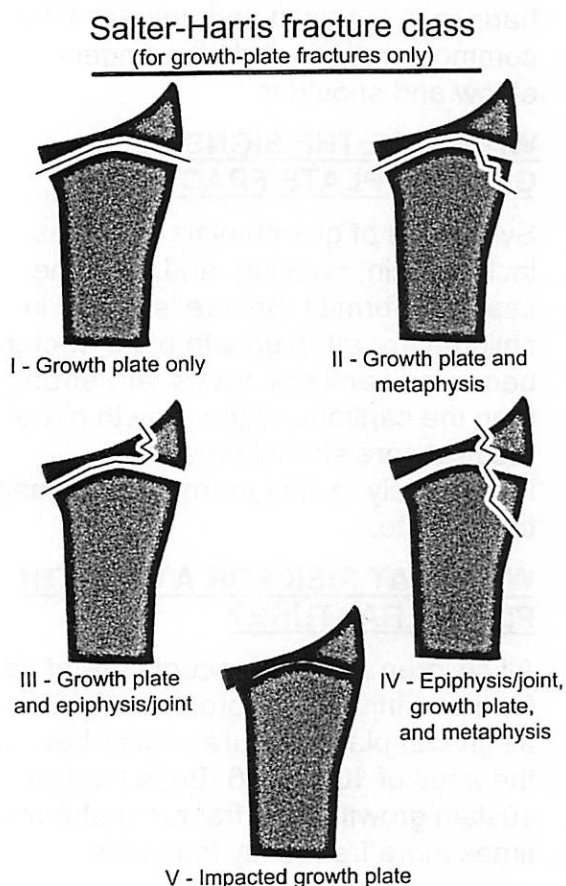
HOW ARE GROWTH PLATE FRACTURES DIAGNOSED?

Your doctor will ask questions about the nature of the injury and examine the area. X-rays will be used to attempt to identify the break. Growth plate fractures are not always visible on X-rays. Often, with a non-displaced growth plate fracture (Salter I), the diagnosis is made only by finding tenderness at the growth plate. In other

cases, a CT (computed tomography) scan, or MRI (magnetic resonance imaging) scan may be ordered to gain a better view of the damage. After the fracture has been located and classified, the course of treatment can be planned.

HOW ARE THEY CLASSIFIED?

The Salter-Harris classification system is used to categorize growth plate fractures:



- Type I is a fracture through the physis. The fragments usually are not displaced. Healing is typically rapid. X-rays often look normal.
- Type II is a fracture in the physis and metaphysis. This is the most common growth plate injury.
- Type III involves the physis and epiphysis.

- Type IV is a break through the epiphysis, physis, and metaphysis.
- Type V is a compression fracture of the physis. This is the most serious type; it has a poor prognosis.

WHAT IS THE TREATMENT?

Treatment depends on the type and severity of the fracture. Hands-on manipulation may be needed to set the bone in proper alignment (often with displaced Salter II fractures). Surgery is necessary if the joint surface, blood supply, or nerves are damaged (usually involving Salter III and IV fractures). A rigid cast or splint may be used to hold the bone in place during healing. Exercises to help regain strength and range of motion may be recommended by your doctor during the recovery phase.

CAN THERE BE COMPLICATIONS?

Most patients heal without long-term complications. Recovery depends largely on the age of the child, the type and severity of the break, the location of the injury, and how well the rehabilitation program is followed.

However, because of their location, growth plate fractures can cause stunted or uneven bone growth. Such problems occur in about 10-15% of growth plate fractures. **This abnormal growth can happen even if the fracture heals in a perfect position.** Growth abnormalities are seen most often in the elbow, ankle, and wrist. Such growth abnormalities may not even be noticed for 1-2 years, which is why it is important to follow up on growth plate fractures clinically and often with x-rays down the road. Sometimes these deformities may benefit from a corrective surgery years in the future.