

## Ankle Injuries

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Acute ankle injury is a common complaint presenting to pediatricians. These injuries are most often seen in basketball, football, volleyball, soccer, and dance. A thorough history and physical is important to make the correct diagnosis. Helpful information from the patient and family includes previous history of ankle injury, mechanism of current injury, recent growth spurt, and level and amount of activity.

Because of the biomechanical makeup of the ankle, inversion is the typical injury mechanism followed by immediate pain and lateral swelling. Sometimes a pop or crack will be felt/heard by the athlete. Physical exam often reveals edema, ecchymosis and tenderness isolated to the lateral side of the ankle along with decreased range of motion and laxity when grasping the heel and moving the foot forward or medially. The athlete may or may not be able to weight bear. Tenderness over the proximal fibula and tenderness over the tibia or anterior joint line may signify a more serious or extensive injury to the syndesmosis, a fracture of the proximal fibula or a tibial fracture.

### **X-RAY IS NOT NECESSARY**

Lateral ankle sprain is the most common diagnosis and plain radiographs are often unnecessary. The physical exam can guide imaging and treatment. The Low Risk Ankle Rules (LRAR) is a validated clinical decision rule that safely reduces the use of plain radiographs in children and teenagers with acute ankle injuries and has 100% sensitivity in detecting a clinically significant fracture. The LRAR states that on physical exam, isolated tenderness and edema over the distal fibula and/or adjacent liga-

ments distal to the tibial anterior joint line signifies a low risk ankle injury and does not warrant an x-ray as this would not change the treatment.

### **Low Risk Ankle Rules**

Isolated tenderness/edema over the distal fibular and/or adjacent ligaments distal to the tibial anterior joint line signifies a Low Risk Injury

### **Low Risk Ankle Injury**

- lateral ankle sprain
- nondisplaced Salter-Harris types I and II fracture of the distal fibula
- avulsion fracture of the distal fibula/lateral talus

### **BUT WHAT ABOUT THE GROWTH PLATE?**

Salter and Harris reported that the physeal cartilage is weaker than the ligaments so tenderness over the distal fibular physis in a skeletally immature athlete with negative radiographs is commonly diagnosed with a Salter Harris I distal fibula (SHIDF). Boutis and colleagues found that in children with radiograph-negative lateral ankle injuries, only 3% had SHIDF on magnetic resonance imaging (MRI). Ligamentous injury or sprain was the most common pathology found on MRI. Furthermore, those with fractures only detectable on MRI had a similar treatment course and recovery time to those diagnosed with a sprain. Treatment in each group consisted of a removable splint and return to activity as tolerated by the patient. The majority of patients in their study re-

covered within one month with the remaining recovering within 3 months.

### **WHAT IS THE TREATMENT?**

Acute treatment for ankle injuries includes protected weight bearing, ice, rest, and elevation. Immobilization and weight-bearing status depends on level of pain and edema. Brief immobilization in a pneumatic walking boot until the patient can walk comfortably helps avoid crutches and provides protection. A lace up ankle brace with or without crutches is also appropriate as the lace up brace is often used as the patient returns to sport. Early range of motion is safe and can be beneficial in recovery.

Sprains are typically graded 1-3 based on severity of swelling and laxity. Grade 1 injuries take approximately 2-4 weeks to resolve, Grade 2 injuries take approximately 4-6 weeks, and Grade 3 injuries can take up to 3 months or longer.

Grading is based on exam and sometimes imaging, though advanced imaging such as MRI is rarely indicated for acute injury. Patients that have repeat ankle sprains may have chronic instability and/or cartilage defects and require imaging if they have failed conservative treatment with physical therapy directed at strength and balance.

### **PREVENTION**

High body mass index (BMI), previous ankle sprain, increased height, and poor balance have been shown as risk factors for lateral ankle sprains. The lace up ankle brace has been shown to prevent a repeat lateral injury in athletes with a prior injury but has not been shown to prevent initial injury. Balance training has been shown to decrease lateral ankle injuries.

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