



GUIDELINES FOR PEDIATRICIANS LATERAL ANKLE SPRAIN AND REHABILITATION

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Pediatrics



Issue 3

Anatomy of ligaments: Lateral (anterior talofibular [ATFL], calcaneofibular [CFL], posterior talofibular [PTFL]), medial (deltoid), anterior and posterior tibiofibular.

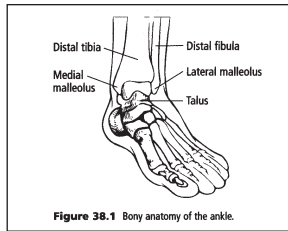


Figure 38.1 Bony anatomy of the ankle.

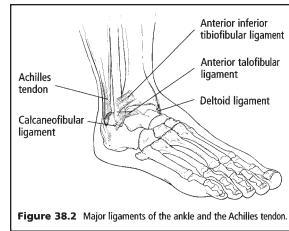


Figure 38.2 Major ligaments of the ankle and the Achilles tendon.

Mechanism: Ligament stretch/tear. Plantar flexion and inversion (turning/rolling in) 85% of the time.

History: Determine foot position (specifically inverted or everted) and how force was applied. Determine location of pain; whether patient heard or felt a “pop”; swelling (degree and how soon it occurred after injury); if patient was able to walk or play immediately; and whether the patient has had previous ankle injuries. Pain/swelling medially or posteriorly or pain or swelling in the midfoot/forefoot/upper leg may indicate another type of injury.

Physical Examination: Acute ankle assessment may be limited due to pain and swelling. Begin with evaluation of uninjured ankle. *Inspection:* Swelling initially severe over one or more lateral ligaments. Spreads over time. *Palpation:* Examine the entire leg and foot for associated injury. Check neurovascular status (capillary refill, pulses, sensation). Palpate ankle ligaments sequentially along with peroneal (behind and below lateral malleolus) and Achilles tendons. Palpate growth plates of distal fibula and tibia. Tenderness indicates a fracture is likely, even if it is not apparent on initial radiographs. *Ligament testing:* Anterior draw test (assesses ATFL) – hold the heel in a neutral position (90°) and stabilize the distal tibia and fibula, then pull the heel forward. Talar tilt test (assesses CFL and deltoid) – grasp the heel and stabilize the tibia, then invert and evert the ankle. Laxity and excursion are compared with the uninjured ankle.

Differential diagnosis (early referral): Proximal fibula fx, syndesmosis (thick ligaments connecting distal tibia and fibula) disruption, base of fifth metatarsal fx, Lisfranc fx-dislocation, Salter-Harris fx.

Radiographs: Standard radiographs - AP, lateral, and mortise views. Stress radiographs, bone scans, arthrography, CT, and MRI do not have a place in the initial evaluation of a sprained ankle.

Referral: Uncomfortable with the examination or the severity of the injury. Uncomfortable instructing rehabilitation programs or more supervision than you can reasonably provide. May provide more rapid progression through a closely supervised rehabilitation program for earlier return to play.

Treatment (reverse side): Initial phase involves **PRICE** (protection, rest, ice, compression, and elevation). *Heat* should never be used in the initial treatment period. Weight bearing as soon as possible. Nonsteroidal anti-inflammatory drugs (NSAIDs) can help reduce swelling and pain. Second phase involves early protected motion and weight bearing as tolerated. Use of elastic bandages, braces (Figure 8, stirrup), casts, and crutches depends on the severity of the injury. Third phase involves functional conditioning with proprioception, agility, and endurance training. Program may take only 2 weeks to complete for minor sprains or up to 8 weeks for severe injuries. Early surgery for the acutely sprained ankle is almost never indicated in the pediatric population.

Taping/Bracing: Most supportive function of taping is lost after 20 minutes of activity. Semi-rigid, air-cushioned stirrup, and lace-up braces may be used in the initial or intermediate treatment of most ankle sprains. Lace-up ankle braces provide support, but little compression. Air-cushioned stirrup braces give support and compression. Several brands are available at orthopedic appliance and brace shops and pharmacies. Braces allow many athletes to return to activity with less pain and swelling. After pain has subsided and the athlete can walk without a limp, the brace or tape should be applied only during practices, games, or high-risk activity. Leaving the brace or tape in place at all times restricts functional range of motion and encourages psychological dependence.

Follow-up: 1 to 2 weeks after injury. Pain and swelling should diminish and pain-free mobility should return. If the expected course of improvement does not occur, then referral should be considered. Once the patient has normal range of motion, flexibility, strength, and functional ability, it is safe to allow return to full activity.

Figures reproduced from Sullivan JA and Anderson SJ, eds. 2000. *Care of the Young Athlete*. Rosemont and Elk Grove Village, IL: American Academy of Orthopedic Surgeons & American Academy of Pediatrics.

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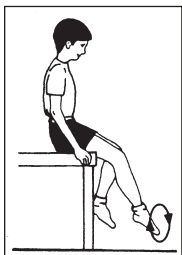


What is an ankle sprain? A sprain is a stretching or tearing of the ligaments that connect the ankle bones. Ligaments on the outside of the ankle are frequently injured when the foot is turned inward or “rolled over.”

What are the signs and symptoms of an ankle sprain? Pain, swelling, and inability to walk or run are common complaints. Usually the bone is not as tender or sore as the area around it.

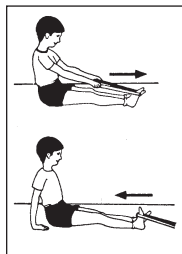
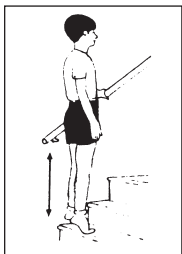
How can I rehabilitate an ankle sprain? Completing a *functionally progressive rehabilitation program* (walking/jogging/running) speeds return to usual activities and may prevent recurrent injuries or problems. *Fitness* should be maintained by doing alternative pain-free activities (eg, swimming, weights, cycling) during the rehabilitation process. Participating in sports before normal motion and strength have returned can result in further injury or permanent disability. Physical therapists or athletic trainers may be very helpful. If this is the case, your pediatrician will make a referral.

Rehabilitation consists of three phases. It may take as little as two weeks to complete for minor sprains or up to eight weeks for severe sprains. If the injury is not improving with the rehabilitation program, a return visit to your pediatrician or referral to an orthopedist or sports medicine specialist may be necessary.



Phase 1: Resting and protecting the ankle to permit healing, prevent further injury, and control pain and swelling (usually two to three days).

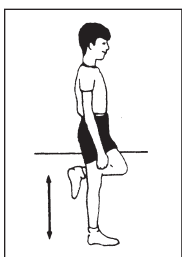
Initial care involves PRICE (protection, rest, ice, compression, and elevation). Use of elastic bandages, braces (figure 8, stirrup), casts, and crutches depends on the severity of the injury. If a bone is not broken, putting weight on the ankle is permitted and encouraged, sometimes even on the day of the injury. Ice (15 to 20 minutes every few hours for two to three days), compression (pressure wrap), and elevation (above the heart) help control swelling and pain. Anti-inflammatory drugs, such as ibuprofen or naproxen sodium, help reduce pain and swelling but may not promote healing. Heat should never be used in the initial treatment period. Several easy exercises can help improve ankle range of motion. Your pediatrician will tell you when to begin these exercises, how often to perform them, and for how long to continue. A beginning exercise (three times a day) is to write the alphabet in the air with your toes. Make the letters bigger as your motion improves.



Phase 2: Starts once pain and swelling begin to subside and athlete can comfortably bear weight and walk. Apply ice to ankle after each rehabilitation session.

Begin strengthening and range of motion exercises as soon as enough ankle movement has returned to do the exercises properly. Simple toe raises on a flat surface or on the edge of a step, held for 10 seconds and done 10 to 12 times each session two times a day, are easy exercises to start with. Pushing down, pulling up, and turning in and out against elastic tubing or a towel wrapped around the foot and held by the athlete or a partner can also help restore strength and motion.

Hold each movement for 10 seconds, 10 to 12 times each exercise session. Complete one or two exercise sessions each day. Your pediatrician will show you how this is done.



Phase 3: Restoring ankle function and sport-specific skills. Apply ice to ankle after each rehabilitation session.

This phase begins after joint motion has been regained and strength and low-impact aerobic activities are tolerated (walking/jogging). Balance can be restored by standing on the injured leg for up to 30 seconds with or without hands held out to the sides and with or without eyes closed. Early on, holding a tabletop may be necessary to be stable. As balance improves, agility exercises, including jumping forward, backward, and side to side, can be added. Functional progression continues with jogging and then running straight on a flat surface. This progresses to “cutting” (running figure eights) and then sprinting. Sport-specific drills should be added with a gradual return to practice and competition. Rehabilitation exercises, taping, and/or bracing should be continued until the athlete is symptom free with full activities for at least one month.

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