

## Ankle Inversion Sprain Injuries

Ankle injuries are common complaints, both in emergency rooms and doctors' offices. Approximately 1 million ankle injuries occur every year in the U.S., and many of them are inversion sprain injuries.<sup>1</sup> Many ankle injuries can be treated adequately in YOUR office.

### Definition

Sprain occurs when ligament fibers tear. This rarely happens in the middle, but rather a tear at the proximal or distal point of attachment. The ankle sprain is often thought of as an injury involving only the lateral ankle ligaments. However, other structures are also frequently injured.<sup>2</sup> A small fragment of bone may be avulsed with the ligament instead of the ligament alone being torn.

### What Causes Ankle Inversion Injury?

An inversion sprain occurs when the ankle turns inward. The anterior talofibular ligament is the most commonly affected,<sup>2</sup> with the calcaneofibular ligament also tearing if the stress occurs with the ankle at right angles (Fig. 1). Subluxation occurs at the ankle joint, implying a partial separation of the ankle bones.

Other injuries which have been noted in connection with an ankle sprain include the posterior talofibular ligament, ankle joint capsule, extensor digitorum brevis, sinus tarsi, peroneal tendons, Achilles tendon, calcaneal-cuboid ligament and the syndesmosis.<sup>2</sup>

### What Do X-Rays Reveal?

Stress x-rays taken with the foot inverted reveal the abnormal tilt of the talus within the mortise (Fig. 2). An excess of 15° talar tilt indicates the presence and extent of ligamentous tear. Ankle series of radiographs is indicated to rule out fracture.

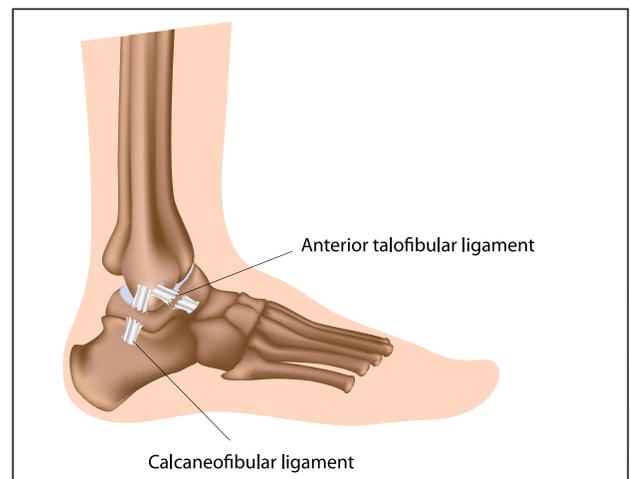


Fig. 1. Rupture of the calcaneofibular and talofibular ligaments

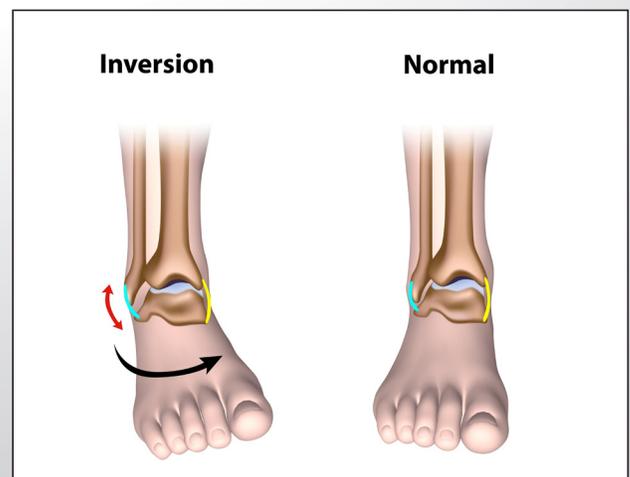


Fig. 2. Inversion on stress

### What Should I do for a Patient with Inversion Sprain?

Treatment options differ according to the grade of injury: Grade I and Grade II sprains usually respond to an application of the "PRICE" formula: Protection, Rest, Ice, Compression, and Elevation.

- Manipulation of involved subluxations
- Daily ice sessions (20 minutes)
- Pain-free, short-arc range of motion exercises

Rehabilitation exercises are designed to increase flexibility, range of motion, strength, proprioception, and—if appropriate—sport-specific development prior to resumption of full activity.<sup>4</sup> **Thera-Ciser**<sup>®</sup> Ankle Series exercises, with emphasis on eversion and dorsiflexion, are recommended (Fig. 3).

### What About Stabilizing Orthotics?

Custom-made Stabilizing orthotics are recommended for ankle sprain injuries. Hartsell and Spaulding note "an orthosis... may be beneficial toward reducing injury or be an effective prophylactic for the healthy population,"<sup>5</sup> while the research of Guskiewicz and Perrin "suggests that custom-fit orthotics may restrict undesirable motion at the foot and ankle and enhance joint mechanoreceptors to detect perturbations and provide structural support for detecting and controlling postural sway in ankle-injured subjects."<sup>6</sup>

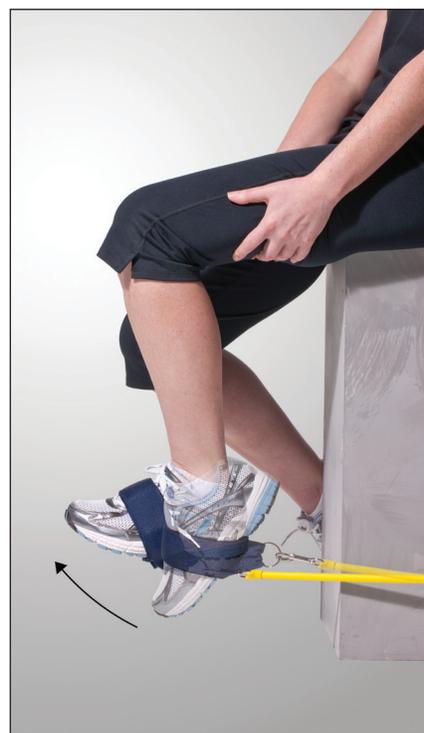
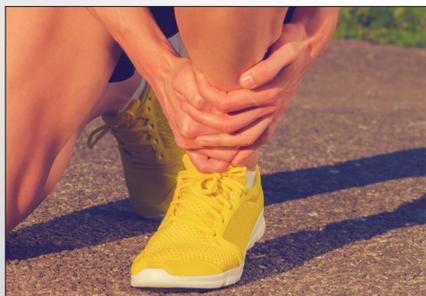


Fig. 3. Thera-Ciser<sup>®</sup> Ankle dorsiflexion exercise.



### Preventative Measures

- Patients should avoid wearing worn shoes that have become non-supportive
- Regular routine of active eversion exercises with Thera-Ciser
- Custom-made Stabilizing Orthotics
- Tape the ankle prior to aggressive activities
- Ankle brace
- Achilles tendon stretching

#### Sources:

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5. Hartsell HD, Spaulding SJ. Effectiveness of external orthotic support on passive soft tissue resistance of the chronically unstable ankle. *Foot Ankle Int* 1997; 18(3): 144-150.
6. Guskiewicz KM, Perrin DH. Effect of orthotics on postural sway following inversion ankle sprain. *J Orthop Sports Phys Ther* 1996; 23(5) 326-331.

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