

# ACHILLES-TENDON STRAIN MOST COMMON INJURY IN SPORTS; CAUSE, SYMPTOMS AND MANAGEMENT

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## Abstract

**Background:** Achilles tendon strain actually identifies itself. First a strain is milder always than a sprain and a strain affects tendons while sprains affect ligaments. A strain involves hyperextension of a tendon or mild tearing of its fibers.

**Methods:** Analytical methods was used for this article by reviewing relevant publications, primarily based on the online sports medicine journals available on Internet, Wikipedia, Elsevier, PubMed, Google Scholar and National Sports Injury Center Saffdarjang Hospital.

**Conclusion:** This review will provide an overview of the Achilles tendon Sprain and their immediate management on playfield. By this sports personals i.e. coach, trainer and player itself would be able to identify this injury. And will give a better understanding about the sign and symptoms of this injury. Approaches should be used to help in sports training and to avoid injury. Good understanding of the injury and their management may be used in the sports to establish safe and effective training guidelines for sportsman.

**Keywords:** Strain, Sports Injury, Achilles tendon, R.I.C.E.

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## Introduction

The term Achilles tendon strain actually identifies itself. First a strain is milder always than a sprain and a strain affects tendons while sprains affect ligaments. A strain involves hyperextension of a tendon or mild tearing of its fibers [1-11]. A sprain gets more involved in major ruptures, blood vessel involvement as well as bone fractures. Finally the term tendonitis means inflammation of the tendon while tendinopathy is often used interchangeably with tendonitis. The term tendinitis means "condition of" the tendon and often is used to define a condition of deterioration or disease. So we finally get to the definition of Achilles tendon strain which is the hyperextension or tearing of tendon fibers [12-26]. Achilles' tendon-strain is injury to the Achilles tendon or its adjoining muscle or bone. These three parts comprise a unit. The strain three types: occurs at the weakest part of the unit.

- 1. Mild (Grade I):** Slightly pulled muscle without tearing of muscle or tendon fibers. There is no loss of strength.
- 2. Moderate (Grade II):** Tearing of fibers in a muscle, tendon or at the attachment to bone. Strength is diminished.
- 3. Severe (Grade III);** Rupture of the muscle-tendon-bone attachment with separation of fibers, Severe strain requires surgical repair. Chronic strain is caused by overuse. Acute strain is caused by direct injury or overstress.

**Body Part involved in Achilles tendon Injury:** Achilles' tendon, Muscle attached to the Achilles tendon, Heel bone, Soft tissues surrounding the strain, including nerves, Periosteum (bone covering),

blood vessels and lymph vessels.

**Signs and Symptoms of this Injury:** Foot pain of injured sportsperson while flexing or extending. Muscle spasm at the rear of the calf and Swelling around Achilles tendons. Loss of strength incase of moderate or severe strain. Crepitation feeling, when injured area is pressed with fingers. Calcification of the muscle or its test with x-ray. Inflammation of the sheath covering the Achilles' tendon is also another sign of this injury.

**Causes of this injury in Sports:** The common occurrence of Achilles tendon strain in sports will often arise in the sports of baseball, basketball and football. However where it is very common is in track. Trying to go fast, jumping (hurdles), cutting (football) or twist ing in the air are just some of the scenarios where an athlete could develop Achilles tendon strain. Additionally Achilles tendon strain can occur from poor footwear. An athlete will get a favorite pair of shoes and not want to quit wearing them. Aging will cause changes and deterioration in the Achilles tendon. Athletes most prone are between the ages of 30-40. They are getting older but not old enough to feel they must slow down or be more cautious. It becomes especially dangerous to run uphill.

Athletes who suddenly increase their activity or warm up improperly are prone to the condition. And of course a medical condition such as Rheumatoid Arthritis can greatly affect the Achilles tendon. Prolonged over use of muscle tendons units in ankle is also another cause of this injury. Single episode of stressful over-activity, as in events like hurdling, long & high jumping or starting of sprints is other main cause of the above said injury.

**Precaution to avoid this Injury:** Contact sports should be stopped. The Running events require quick starts, such as long-jumping, hurdling or sprinting must be avoided. Any cardiovascular medical problem that results in decreased circulation. Obesity should be controll. Proper nutrition's must be taken by the athlete. Poor muscle should be conditioned.

**Prevention:** Participate in a strengthening and conditioning program appropriate for your sport. Warm up before training session or competition. Tape the Achilles' area before practice or competition. This injury can be prevented by wearing proper protective shoes.

**Appropriate Health Care:** Doctor's diagnosis is essential. Strapping of tape is recommended on injured part. Plaster splints or casts (sometimes) and self-care is very important during rehabilitation of injury. Physical therapy should be administered in case of moderate or severe strain. Surgery on advised on Doctor in case of severe strain.

**Possible Complications:** Prolonged healing time if activity is resumed too soon. Proneness to repeated injury, because unstable or arthritic ankle following repeated injury. Inflammation at the attachment of bone (Periostifs) prolonged and sometimes disability.

**Probable Outcome:** If this is a first time injury, proper care and sufficient healing time before resuming activity should prevent permanent disability. Torn ligaments and tendons require as long as long as to heal as bone fractures. Average healing times are: Mild strain-2 to 10 days; Moderate strain-10 days 6 weeks; Severe strain-6 to 10 weeks; If this is a repeat injury, complications listed above are more likely to occur.

**On field Management of this injury and Follow up from R.I.C.E. to M.E.A.T:-**

When this injury occur than for immediate management on playfield follow instructions for R.I.C.E, the first letter of rest, ice, compression and elevation. We all know the age-old acronym for sports

injury: RICE, The rule of thumb after an athletic injury is **R.I.C.E:-**

**Rest:** Activity should be stop immediately when injury occurred, the injury should be splinted, and weight should not be applied to the injury. And keep the injured players in resting position.

**Ice:** Ice packs reduce pain and swelling and should be applied judiciously for 20-minute periods to avoid ice burn or frost bite. Packs should be removed for intervals of 40-60 minutes before being reapplied. Ice therapy should discontinue after 24 to 48 hours.

**Compression:** compression decreases swelling by slowing the bleeding and limiting the accumulation of blood and plasma near the injured part. Compression should be applied lightly in the form of an elastic wrap or any available soft clothes. So that it accommodates swelling. Anytime the wrap seems too tight or causes swelling below the wrap it should be loosened.

**Elevation:** Holding the injured part above the level of the heart is standard treatment to reduce swelling and to stop bleeding in case of injury combined with open wounds.

When we apply R.I.C.E therapy and anti-inflammatory medications we decrease pain by blocking the inflammatory cascade, but in doing so we suppress healing. This is worsened by the use of anti-inflammatory medication. Apart from the fact those NSAIDs can cause perforating ulcers; NSAIDs have been shown to inhibit bone healing after fracture. It is reasonable to suspect that if NSAIDs inhibit bone healing, then they may inhibit healing of tendons and ligaments. RICE + NSAIDS = less pain now, but sub-optimal healing. Thus, shifts from RICE to MEAT. It is recommended RICE for the first 24-48 hours after the injury (ice 15 minutes on, 15 minutes off and no NSAIDS), after heal up of injury shift to MEAT.

**MEAT** encourages the body's own natural healing capacity to do its thing.

**Movement:** Movement of the affected body part prevents the formation of adhesions and increases circulation which transports in nutrients and carries away metabolic waste. Range of motion movements such as the "alphabet in space" drawing the alphabet with you foot, hand, finger. Whatever is injured, can and should begin immediately after the injury (although there may be very little movement possible in the early stages).

**Exercise:** After the acute stage of injury, exercises should gradually commence. This strengthens the injured part, and also prevents pain signals from getting "hard-wired" into your nervous system by "working through" the pain. It is important, however, that you are not in fact further injuring the tissue by doing too much too soon.

**Analgesia:** This is the use of natural or pharmaceutical medications to decrease pain without interfering with healing. Injured Sportsperson can heal faster when he is not in pain. Acetaminophen has a substantial risk liver toxicity profile (liver toxicity) but it can help to decrease pain and has not been shown to inhibit healing. Certain over-the-counter nutritional supplements can be effective for pain. For severe pain, it is needed to be evaluated by a doctor, for prescription pain medicines.

**Treatment:** Contrast bath should be given for reducing the swelling. It is alternating heat and ice increases circulation and helps with healing – heat two minutes, ice thirty seconds, and do around 10 or so repetition a few times per day. Good treatments for acute injuries are acupuncture and mesotherapy. The best treatment for chronic sports injuries involving ligaments or tendons is re-

generative injection therapy using platelet rich plasma which can regenerate damaged ligaments and tendons to restore function and eliminate pain.

**Continue Care:** If a cast or splints are used, leave toes free and exercise them occasionally, if a cast or splints are not used: Use ice massage 3 or 4 times a day for 15 minutes at a time. Fill a large Styrofoam cup with water and freeze. Tear a small amount of foam from the top so ice protrudes. Massage firmly over the injury area in a circle about the size of a softball. After the first 24 hours, apply heat instead of ice, if it feels better. Use heat lamps, hot soaks, and ointments. Take whirlpool treatment, if available. Wrap the injured ankle with an elasticized bandage between treatments. Insert a heel lift in your shoe. Massage gently and often provide comfort and decrease swelling.

**Diet-** Eat a well-balanced diet that includes extra protein, such as meat, fish, poultry, cheese, milk and eggs, Increase fiber and fluid intake to prevent constipation that may result from decreased activity.

**Conclusion:** This review will provide an overview of the Achilles Tendon Sprain and their immediate management on playfield. Thus sports personals i.e. coach, trainer and player themselves would be able to recognized this injury. And will give a better understanding about the sign and symptoms of this injury. Approaches should be used to help in sports training and to avoid injury. Good understanding of the injury and their management may be used in the sports to establish safe and effective training guidelines for sportsman.

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