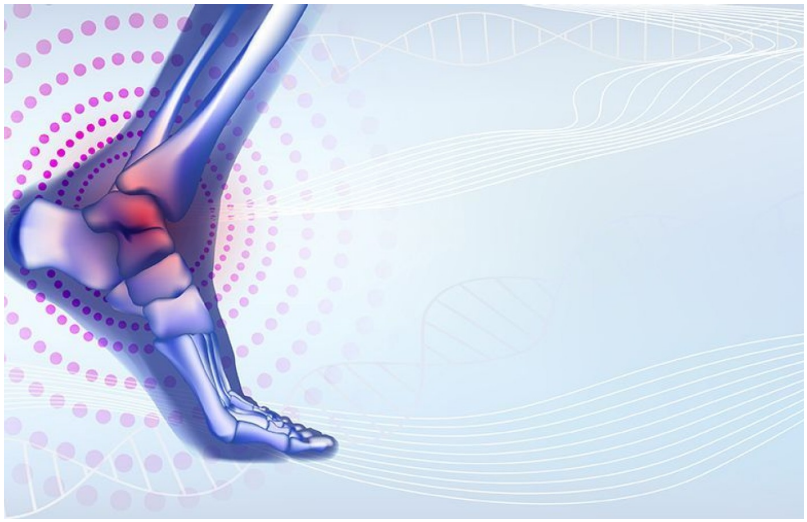
Dynamic Chiropractic



LASERS & TENS

Managing Ankle Sprains: Clinical Do's & Don'ts

WHY ICE IS THE WRONG OPTION AND A BETTER SOLUTION.

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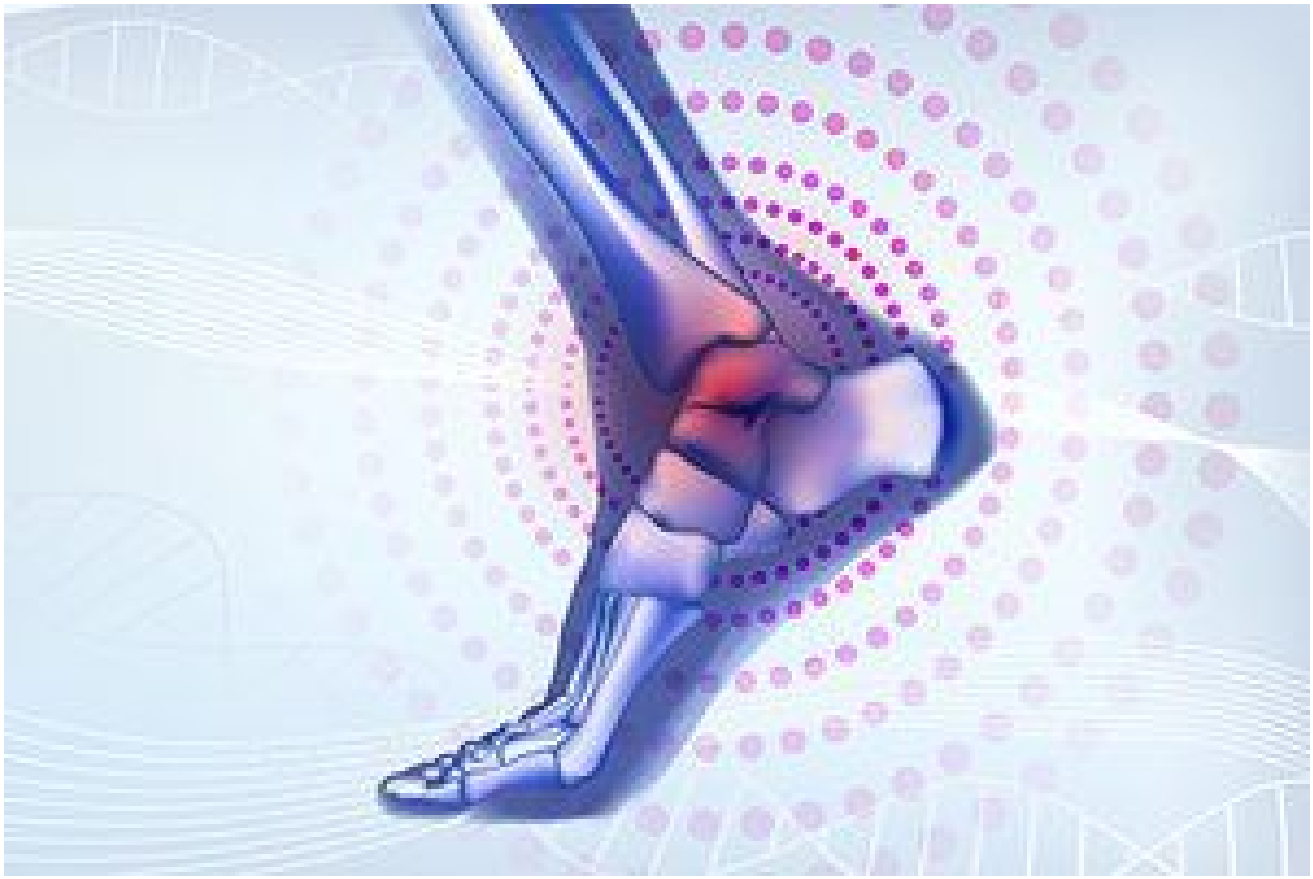
Ankle sprain is a common sports injury in physically active individuals, with a large financial burden on the health care system. U.S. emergency departments reported an incidence in 2010 of 3.29 per 1,000 persons per year. The health care costs resulting from ankle sprain are $6.2 billion in U.S. high-school athletes alone annually.[1]

The Challenges

Once an ankle is sprained, it predisposes the athlete to recurrent ankle sprains and residual symptoms. Some sports, such as basketball and soccer, see more than 50 percent recurrent ankle sprains; and residual symptoms such as pain, instability (actual or perceived), swelling and weakness are present in nearly three-fourths of patients.[2]



Acute ankle sprains occur frequently across all levels of sports participation, and in other active populations such as active-duty military personnel. Interestingly, half of all ankle sprains treated in U.S. emergency departments did not occur during sport activity.[3]

"Chronic ankle instability, developing from ankle sprain, is one of the most common sports injuries. Besides it being an ankle issue, chronic ankle instability can also cause additional injuries."[4]

With the goal of providing proper treatment for acutely sprained ankles, reducing the incidence of recurrence, lowering overall health care costs, and most importantly, improving the quality of life for our patients, let's focuses on two modalities used to treat ankle injuries: cryotherapy and photobiomodulation.

Cryotherapy: The Wrong Strategy?

Consult nearly any source on the suggested treatment for acute injuries and you will find the RICE protocol,[5-7] with even Harvard Medical School on the cold bandwagon. RICE (Rest, Ice, Compression and Elevation) was first introduced into the health care lexicon by Dr. Gabe Mirkin in his *The Sportsmedicine Book* (1978).

For years, ice has been used to treat acute injuries under the premise that it alleviates pain, reduces tissue metabolism and reduces swelling. It has been a standard treatment for injuries and sore muscles because it helps to relieve pain caused by injured tissue. Health care providers have used and recommended the RICE guideline for decades, but now it appears that both ice and immobilization

may delay healing.

In 2015, Dr. Mirkin completely reversed course and now strongly advocates *against* the use of ice on acute injuries. Healing requires inflammation; and anything that reduces or suppresses inflammation will also delay healing.

"Applying ice to injured tissue causes blood vessels near the injury to constrict and shut off the blood flow that brings in the healing cells of inflammation," wrote Dr. Mirkin. "When you damage tissue through trauma or develop muscle soreness by exercising very intensely, you heal by using your immunity, the same biological mechanisms that you use to kill germs. This is called inflammation."[8]

Normal injury healing progresses sequentially through the stages of inflammation, proliferation, remodeling, and maturation. Interrupting the first stage – inflammation – will delay and reduce the effectiveness of the subsequent three stages. So, if you plunge that sprained ankle into an ice bath, and then apply ice several times a day, you are making the injury worse, not better. Icing injured tissue causes constriction of blood vessels near the injury, which shuts off the blood flow that brings in the healing cells of inflammation.[9]

Swelling vs. Inflammation

Although they are often used interchangeably, "*swelling*" and *inflammation* are in fact two distinct terms. Inflammation is classified as a protective response from the immune system to injury, infection or irritation; swelling is caused by the accumulation of fluid in tissues in a specific region or throughout the body.[10] In acute ankle sprains, swelling can occur when the body has sent all of the necessary stem cells, blood, plasma, fluid, and proteins to the area to fight the invading injury and begin the healing process from within.[11]

A Better Solution: Laser Therapy

What is a better solution? Photobiomodulation (PBM), more commonly known as laser therapy. Therapeutic laser devices deliver red and infrared wavelengths of light to both superficial and deep tissues to enhance blood circulation, increase tissue oxygenation and improve metabolic activity.

In turn, this helps the body progress through the healing stages of inflammation, proliferation, remodeling, and maturation. Treatments with a class 4 therapeutic laser are safe and non-invasive, and can be applied immediately after injury.

PBM treatments have been labeled as "anti-inflammatory," but this is a misnomer. PBM does not suppress or inhibit inflammation, but instead helps with resolution of the inflammatory process. "Photobiomodulation (PBM) is able to reduce or inhibit production of important inflammatory mediators such as IL-1, IL-6, PGE2, and MMPs and significantly reduce leukocyte infiltration in different inflammatory conditions."[12]

Treatment Guidelines Using Laser

Laser therapy treatments should be delivered to acute injuries as soon as possible. Proper laser treatment for a sprained ankle begins proximal to the injury site to stimulate circulation, and more importantly to open venous and lymphatic return channels in the leg. Swelling in the sprained ankle is

primarily due to lack of adequate fluid drainage. Once the proximal tissues have been treated with the laser, the ankle itself can be lasered.

A proper laser protocol for the leg portion of the treatment would use power between 6 and 9 watts, treatment time of 4-5 minutes, with total energy delivered between 1,440 and 2,700 joules. Given that the treated surface area is about 400 square centimeters, this equates to a surface dosage of 3.6 to 6.75 J/cm2, which is appropriate for acute injuries.

For the ankle, power between 4-5 watts, treatment time of 3-4 minutes with total energy of 720 to 1,200 joules for a dosage between 2 and 4 J/cm2 is appropriate.

Laser treatment can be delivered daily until the swelling is down, pain levels have subsided and the patient has gained some degree of mobility. Treatment should continue into the rehabilitative phase, as the patient gains strength and re-establishes proprioceptive input from the injured ankle.

Remember, cryotherapy should *not* be used on acute ankle sprains; today's practitioner will utilize photobiomodulation for pain relief and tissue healing.

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