PEMF & MULTI-POLAR RADIO FREQUENCY

ADVANCES IN THE TREATMENT OF SOFT TISSUE INJURIES AND CONDITIONS

VENUSCONCEPT
delivering the promise

Soft tissue injuries and conditions are among the most common reasons people seek care from sports medicine and rehabilitation specialists.

The professional's goal is to relieve pain, help the patient regain full movement, and strengthen the weakened area to prevent re-injury.

Achieving these outcomes can be challenging, and many people have misconceptions about the healing process. Unfortunately, this combination of factors often leads to frustration among patients—competitive athletes especially—when recovery does not go as anticipated or pain becomes chronic.

However, with the latest breakthroughs, ongoing educational opportunities, and treatment innovations, more effective and efficient therapy is possible. In fact, the potential for patients to fully recover, enjoy their previous quality of life, and regain their previous level of performance has markedly improved. Among the newest modalities is the combination of Multi-Polar Radio Frequency (RF) and Pulsed Electro Magnetic Fields (PEMF).

In this report, we will introduce this synergistic approach, which is opening a new avenue of treatment, alongside some of the common points of injury and latest advances in the treatment of soft tissue injuries.

WHAT ARE SOFT TISSUE INJURIES

First, let's recap the basics. Soft tissue injuries refer to damage to muscles, ligaments, and/or tendons, and they can result from direct or indirect trauma. Direct trauma includes impact or abrupt overloading, while indirect trauma is tied to repeated sub-maximum loading, as with overuse injuries.[1] Symptoms of soft tissue injuries and conditions may include pain, swelling, and restricted movement.

There are four common injury types to consider:

CONTUSIONS (BRUISES)

These soft tissue injuries result from blunt trauma, such as a fall or a blow to the damaged area. Symptoms typically include swelling, pain, and bleeding in the tissue that causes discoloration—the classic black-and-blue marks.[2]

SPRAINS

These soft tissue injuries occur when ligaments—the bands of connective tissue connecting bones or joints—stretch, often resulting from a twisting force. Common sites for sprains are wrists, ankles, and knees. Symptoms include pain, swelling, bruising, and limited mobility in the affected joint.[3]

TENDONITIS

This soft tissue injury is marked by inflammation of the tendons, which refers to the connective tissue between muscles and bones. This injury often results from overuse and commonly occurs in the elbows, hands, wrists, hips, and shoulders. Symptoms can include tenderness, cramping, and weakness.[4]

STRAINS

This final type of soft tissue injury happens when muscles or tendons stretch and tear. Strains of the lower back and hamstrings are among the most common presentations.[5]

[1] Ransone, J., et al. (1995). Chapter 9: Soft Tissue Damage and Healing In C. Harmon Brown (Ed.), IAAF Medical Manual: A Pratical Guide. Monte Carlo, Monaco: International Association of Athletics Federation (IAAF). Retrieved from https://www.iaaf.org/about-iaaf/documents/health-science.

[2] American Academy of Orthopaedic Surgeons (2015, July). Sprains, Strains and Other Soft-Tissue Injuries. OrthoInfo. Retrieved from https://orthoinfo.aaos.org/en/diseases--conditions/sprains-strains-and-other-soft-tissue-injuries/

[3] Ibid.

[4] Ibid.

[5] Ibid.

PRESENTATION AND TREATMENT OF SOFT TISSUE INJURIES AND CONDITIONS

Soft tissue injuries present themselves in three phases: acute, subacute/overuse, and acute chronic. The acute stage (macrotrauma) is caused by sudden overload, while subacute/overuse (microtrauma) stems from excessive, accumulated loading. The final stage can be a result of both cumulative loading and rapid overloading.[6] Other injury pathways include repair mostly via fibrosis, which may lead to a degenerative response.[7]

When the body adapts to the tissue overload, symptoms resolve on their own.[8] Generally speaking, healing spans three phases: the acute inflammatory stage (lasting up to 72 hours), the repair stage (lasting from 48 hours to six weeks), and the remodeling stage (from three weeks to a year or more).[9]

The classic treatment protocol in the first three days after a soft tissue injury is to apply rest, ice, compression, and elevation (RICE) to the injured area while avoiding the common "HARM" factors, which refers to heat, alcohol, running or exercise, and massage. This treatment protocol primarily provides symptom relief, but it does not typically address the underlying injury.[10]

Further treatment often focuses on thermal or mechanical therapy. Energy-based devices including ultrasound, transcutaneous electrical nerve stimulation (TENS), cold laser, and other modalities are used to address tissue pain, stiffness, and weakness.[11] Therapies such as Active Release Techniques (ARTs), the Graston Technique, massage, and musculoskeletal manipulation/chiropractic techniques are occasionally used, too.[12]

[6] Ransone, J., et al. (1995).

[7] Ibid.

[8] Ibid.

[9] Ibid.

[10] Järvinen, T.A., Järvinen, M., and Kalimo, H. Regeneration of injured skeletal muscle after the injury. Muscles, Ligaments and Tendons Journal. 2013; 3(4): 337–345.

[11] Ransone, J., et al. (1995).

[12] Lambert, M., et al. (2017). The effects of instrument-assisted soft tissue mobilization compared to other interventions on pain and function: a systematic review. Physical Therapy Reviews 2017; 22: 1–2, 76–85.

COMMON MISCONCEPTIONS AND THE NEED FOR ADVANCES

While the science of soft tissue injuries is well established, misconceptions are common among patients and sometimes even providers, especially general practitioners.

Among the most common misunderstandings are that soft tissue injuries will heal in a matter of weeks. The reality is that healing, including remodeling of the tissue, can take an extended period—sometimes more than a year[13]—and complete healing may never occur depending on treatment, type of injury, age, lifestyle, or other factors.[14,15]

One study found that only 12 percent of people with a soft tissue neck injury experienced complete recovery more than a decade after their accident.[16] Another study of patients with whiplash found that 70 percent complained of symptoms related to the original injury 15.5 years afterward.[17]

Another frequent myth is that soft tissue injuries will resolve spontaneously with no long-term effects. While this may be the case with minor injuries, many people experience residual and/or chronic symptoms, including pain as well as loss of strength, function, flexibility, mobility, reaction time, or balance. Compensations in movement for these deficits can lead to a cascade of other issues.[18,19,20] This is why the rehabilatation community continues to seek to elevate the standard of care.

In this area, Venus Concept is a leader in innovation.

With a focus on energy-based medical technology, our research has led us to an innovative combination of three modalities—referred to as RP3 technology—that deliver synergistic benefits for repairing soft tissue injuries and conditions faster than conventional methods. The three modalities of RP3 are Multi-Polar RF, PEMF, and massage.

[13] ChiroTrust. (2014, January). The Healing of Injured Soft Tissues. ChiroTrust.org. Retrieved from https://chiro-trust.org/whiplash/healing-injured-soft-tissues-including-neck-back/

[14] Kraemer, W., Denegar, C., and Flanagan, S. Recovery From Injury in Sport: Considerations in the Transition From Medical Care to Performance Care. Sports Health. 2009 Sep; 1(5): 392–395.

[15] Studin, M. (2016, January 25). Soft Tissue Injuries: What are they and the Long-Term Impact of Bodily Injury. U.S. Chiropractic Directory. Retrieved from http://www.uschirodirectory.com/index.php?option=com_k2&view=item&id=764:soft-tissue-injuries-what-are-they-and-the-long-term-impact-of-bodily-injury&Itemid=377

[16] Gargan, M.F. and Bannister, G.C. Long-term prognosis of soft tissue injuries of the neck.

J Bone Joint Surg Br. 1990 Sep; 72(5): 901–903.

[17] Squires, B., Gargan, M.F., and Bannister, G.C. Soft tissue injuries of the cervical spine. 15-year follow-up. J Bone Joint Surg Br. 1996 Nov; 78(6): 955–957.

[18] Hansen, A.E. and Marcus, N.J. Is It Time to Consider Soft Tissue as a Pain Generator in Nonspecific Low Back Pain?, Pain Medicine 2016 Nov; 17(11): 1,969–1,970.

[19] Mayo Clinic. Myofascial pain syndrome. Mayo Clinic. Retrieved from https://www.mayoclinic.org/diseases-conditions/myofascial-pain-syndrome/symptoms-causes/syc-20375444

[20] Sexton, J. Managing Soft Tissue Injuries. Emergency Nurse. 2002 Apr; 10(1):11–16.

PEMF & MULTI-POLAR RADIO FREQUENCY

A BREAKTROUGH FOR SOFT TISSUE INJURIES AND CONDITIONS

Multi-Polar RF offers homogeneous deep-tissue heating resulting in tissue regeneration and remodeling.[21] PEMF is a non-thermal approach that induces an electro magnetic field in the target tissue, resulting in the stimulation of connective tissue, blood vessels, and muscles.[22] Separately, each of these modalities are well-validated approaches, but when used in conjunction, the two therapies work synergistically to repair affected tissue.[23]

Further, when accompanied by massage, superior soft tissue injury rehabilitation may be achieved. Through thermal action, RF spurs tissue metabolism, blood perfusion, and lymphatic drainage, as well as the synthesis of new collagen and tissue fibers.[24] By inducing an electrical charge, PEMF results in increased collagen synthesis by fibroblasts (the most common cells found in connective tissue), the proliferation of fibroblasts, and the formation of new blood vessels.[25]

This approach addresses three important affected areas: connective tissue, muscles, and the vascular network.[26] Below, we've created a table that helps to break down the effects each therapy can have on the noted affected areas, as well as their effects when combined.

SYSTEMS	RF	PEMF	MASSAGE	SYNERGY
CONNECTIVE TISSUE	Increases collagen synthesis	Stimulates early formation of connective tissue Stimulates vascular network	Facilitates breakdown of connective tissue tension and fascial adhesions if needed	Stimulates cellular processes and collagen synthesis for tissue repair
VASCULAR NETWORK	Spurs vasodilation and enhanced perfusion	Stimulates vascular network	Improves lymphatic drainage	Promotes angiogenesis and the formation of growth factors, and improves short and long-term circulation for tissue rehabilitation
MUSCLES	Reduces pain and spasm, facilitates anabolic processes, and increases blood flow		Breaks boundary layers and improves lymphatic drainage	Relieves pain, speeds healing, and improves muscle recovery and strength

With the Venus Concept platform, known as Venus Heal™, Multi-Polar RF is delivered with an applicator featuring either four or eight electrodes, enabling energy to be delivered uniformly, three-dimensionally, and to precise depths. Therapeutic temperature is also achieved quickly and safely. At the same time, PEMF generates a magnetic field when electrical current flows intermittently. With Venus Heal™, PEMF can also be used without the RF during the acute phase of injury, when heat is not preferred, to help reduce edema. Finally, integrated sensors in each applicator allow for easy and immediate detection of treatment temperature, ensuring therapeutic temperature and patient comfort.

CONTRAINDICATIONS

There are some patients who are not suitable candidates for this combination modality. Contraindications include the following[27]:

- Fractures
- Moderate to severe ligament tears
- Recent surgeries
- Pregnancy
- Chronic use of corticosteroids or beta blockers
- Pacemakers or other active implants
- Passive implants at treatment site
- Acute diseases, fevers, or hematological diseases

[21] Ransone, J., et al. (1995)
[22] Ibid.
[23] Ibid.
[24] Ibid.
[25] Ibid.
[26] Ibid.
[27] Ibid.

CONCLUSION

Specialists, such as sports medicine physicians, athletic trainers, physiotherapists, chiropractors, or other injury rehabilitation care providers, see firsthand the devastating effects of soft tissue injuries and conditions. As a specialist in this area, you are dedicated to helping your patients return to pain-free living and full performance.

At Venus Concept, we work with top-tier practitioners like yourself in more than 60 countries worldwide. Your success is at the center of our mission. If you'd like to learn more about the potential of Multi-Polar RF and PEMF to provide better care for your patients with soft tissue concerns, we invite you to get in touch with us today.

TO LEARN MORE, CONTACT US AT

888.907.0115

VENUSCONCEPT
delivering the promise