

MELTReport

Is it the end of the ICE Age?

“Coaches have used my “RICE” guideline for decades, but now it appears that both **Ice** and complete **Rest** may **delay healing**, instead of helping.”

Gabe Mirkin, MD, March 2014. Author, Best seller 1978, The Sports Medicine Book

If you're like most experienced sports injury practitioners, you've been recommending **Rest, Ice, Compression and Elevation** (RICE) for acute injuries since the seventies.

Back then when playing football and athletics, my 'go-to' guide was Dr Malcolm Read's excellent handbook, *Sports Injuries*.

Recovering from an injury, I found, was never easy but Dr Read's book guided me through my recovery with a series of *Training Ladders*, a graduated series of exercises—each one a little more demanding than the last—finally reaching game-ready status.

The first step however, on every ladder was RICE for the first 48 hours of an injury in which Dr Read claimed that many sports people of that era would, “...disregard this valuable aid.” and “...the most underrated way of dealing with injuries.”

Fast forward to today and we see our sports heroes on TV in the change rooms after the game packed with ice or elite athletes telling us how their gruelling training programs include regular ice baths.

Rest put to Rest

But increasingly the tide has been turning against the gold standard of acute injuries. Professor Gordon Waddell put the boot into Rest many years ago when he called for **bed rest to be put to rest**, in his book **The Back Pain Revolution** (Churchill Livingstone 1990). He said, “It should come as no surprise that there was never any scientific evidence to support the dogma of bed rest for back pain.”

Now, the father of RICE, Dr Gabe Mirkin, the sports medicine guru who coined the term RICE back in 1978 in his best-selling Sports medicine book believes **rest and ice therapy delays recovery from injuries**.

Ice out in the Cold

He points out in a recent post (drmirkin.com) that a systematic review of 22 RCT's (*Am J Sports Med* 2004) found very little evidence that ice and compression over compression

alone, had any significant effect on outcomes although ice plus exercise marginally helped to heal ankle sprains.

A study by Bleakley et al (*Br J Sports Med* 2006) compared two ice therapy methods for an acute ankle injury; **Standard** (20 minutes every 2 hours for 72 hours) versus **Intermittent** (10 minutes on, 10 minutes off and 10 minutes back on repeated every two hours). They concluded that, “**the strength of evidence supporting the use of cryotherapy in managing an acute soft tissue injury is generally poor.**” And the results of their study showed that, “...the benefits are currently restricted to pain relief.”

Dr Simon French, a local chiropractor and PhD, published his review paper (*SPINE* 2006) showing there was better evidence for the effectiveness of a heat wrap for low back pain than ice. He says, “Given that it is a commonly held belief that cold is beneficial for recent onset musculoskeletal injuries (Bleakley 2004), it was surprising that no studies were located that applied cold treatment to acute low-back pain.”

The truth about inflammation

With powerful TV ads by pharmaceutical companies cleverly portraying inflammation as the bad guy, we need to remind our patients that inflammation is good. **Not too much and not too little but healing needs inflammation.**

Passive recovery may lead to an excessive inflammatory response (*too much*) which can delay recovery leading to excessive fibrotic scar tissue. As this excessive scar tissue matures over the following weeks and months, the devastating capsular contracture effects takes place, setting up the next injury. Cryotherapy or anything that reduces the inflammatory cascade significantly (*too little*) such as cortisone and NSAIDs can delay healing, also with long term consequences.

The inflammatory cascade is where inflammatory cells rush to the injured tissue to start the healing process—a natural response beginning instantly after an injury.

It starts with the migration of leukocytes to the site of injury. Within two hours and over the next twenty-four, **neutrophils**—which make up nearly 80% of the white blood cells and form the essential front of our innate immune system—begin their work.

Macrophages (*Greek for big eaters*) arrive the next day and set up camp for the next two weeks. Both neutrophils and macrophages contribute to tissue degradation through the release of reactive oxygen species and production of pro-inflammatory cytokines such as interleukin 1-beta (IL-1 β), interleukin 6 (IL-6), and tumor necrosis factor-alpha (TNF- α).

Ice Keeps Healing Cells from Entering Injured Tissue.

The message from Dr Mirkin now is that, “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 (*Knee Surg Sports Traumatol Arthrosc, published online Feb 23, 2014*).”

The blood vessels did not open again for many hours after the ice was applied.

This decreased blood flow can cause the tissue to die and can even cause permanent nerve damage.

Mirkin says that if you have to apply ice, “You could apply the ice for up to 10 minutes, remove it for 20 minutes, and repeat the 10 minute application once or twice. **There is no reason to apply ice more than six hours after you have injured yourself.**”

Lasers trumps Ice & NSAIDs.

At the same time cryotherapy is being questioned, cold laser or low level laser therapy (LLLT) is seen as the next breakthrough in acute injury care. Almeida et al (*Lasers Medical Science, March 2014*) discovered that LLLT is more powerful than cryotherapy and NSAIDs.

Surprisingly, the researchers concluded, “... in the present study, two of the widely used treatments in the acute phase (**Ice and NSAIDs**) after muscle trauma do not show significant effects compared to the non-treated injured group.”

NSAIDs risk Ligament Damage.

It's no secret that Non Steroidal Anti-inflammatory drugs (NSAIDs) have been the treatment of choice for ligament injuries for many years. They deliver short term gains by (*excessively*) blocking the inflammatory cascade but can lead to poor soft tissue healing and eventual osteoarthritis.

In a study by Slatyer (*Am J Sports Med 1997*) found Australian military recruits with acute ankle sprains were given Piroxicam (Feldene).

While the recruits were able to resume training more rapidly, over the long-term, those in the piroxicam-treated group experienced an **increase in ankle instability, as evidenced by a positive anterior drawer sign.**

M.E.L.T Injuries Away

Today, our patients need new solutions particularly those devotees of ice and NSAIDs.

A holistic approach to the healing of ligaments for long term strength and flexibility is **Movement, Elevation, Laser and Taping (MELT).**

M is for Movement/Mobilisation

Hauser et al point out in their excellent review article, Ligament Injury and Healing (*Open Rehab Journal 2013*) a study by Kerkhoff et al, on ankle ligament injuries in 2,184 adults. They concluded that functional treatment involving motion of the affected joint was a statistically significant strategy for healing the injured ligament, compared with immobilizing the joint.

Patients who treated their **ligament injuries with motion were able to return to work quicker and resume sports activity sooner** than those who were immobilized, and had less objective instability, as shown by stress X-ray.

E is for Elevation

Elevation is a natural way of decreasing the swelling of an acute injury. The rate limiting factor or **bottleneck in lymphatic drainage** are the lymph nodes.

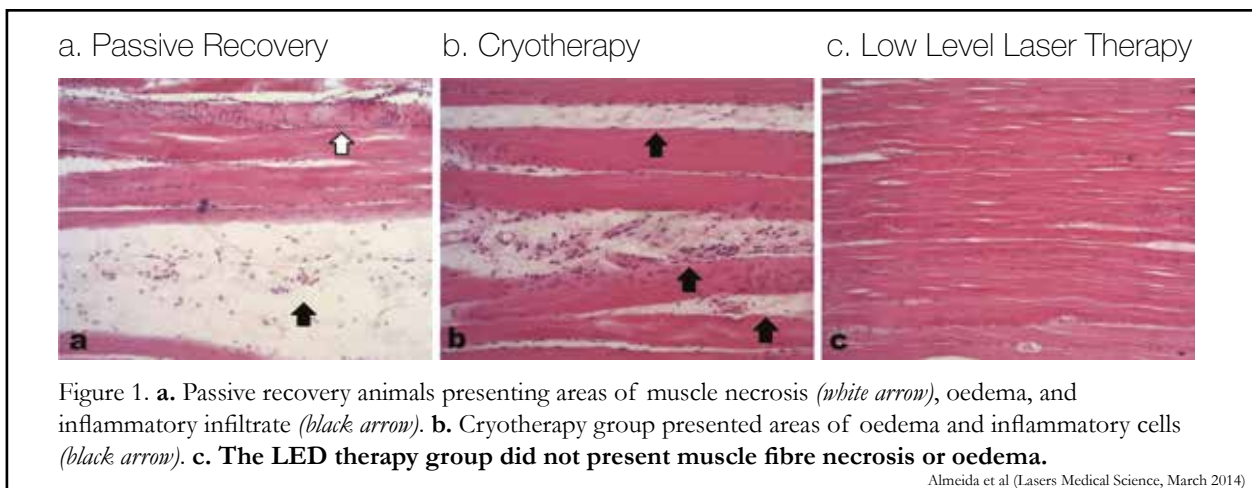
L is for Laser/Lymphatics

Low Level Laser Therapy particularly applied with a super pulsed cold laser such as the ACTIV™ to lymph nodes proximal to the injured tissue can dilate and **improve motoricity of lymphatic drainage.** Piller et al (*Laser Therapy 1995*) discovered lymphoedema patients had 17-40% less oedema with super pulsed laser.

Secondly, apply the ACTIV™ cold laser to the injured tissue for 3-5 minutes for **stronger, more uniform and more flexible repair tissue** (*figure 1*). LLLT has been shown to increase ATP synthesis triggering an immunological chain reaction resulting in macrophage and fibroblast activation.

T is for Taping (Kinesio)

Apply a good kinesio tape. Stretching is good and Rocktape™ is made with 180% elasticity and a bias in its weave allowing a stretch in one direction and not the other. This creates a bio-mechanical ‘lift’ of the skin from the soft tissues underneath, allowing more blood to flow for optimum healing. ■





How To Use M.E.L.T for an Acute Flare Up of a Chronic Injury.

A 43-year-old nurse, Sheree Russell who is on her feet all day, complained of a constant dull ache for the past two years in her left lateral foot. It radiates up into the left calf by the end of the day and occasionally she experiences lower back pain.

She rated her pain levels from a 3-8 out of 10 on the Visual Analogue scale where it begins each morning with a '3' and often ends the day with an '8'.

Sheree reported that two years ago she got up to go to the bathroom in the middle of the night and misjudged a step and sprained her ankle. X-rays the next day confirmed a fracture through the fifth metatarsal head.

She attended twelve weeks of physiotherapy, wore a moon boot and was advised at several specialist appointments to take Lyrica (anti-convulsant) to slow down the conduction of nociception.

Examination Findings

Her gait was mildly guarded, with weight bearing more prominent on the right leg. This we suspect is in avoidance of the pain in the left leg. Her foot ranges of motion are slightly restricted – with a complaint of pain in all planes – but she is able to perform them. The area of the cuboid and fifth metatarsal was very tender to touch. The peroneal longus and brevis muscles were tight with palpable trigger points.

Radiology Findings

The foot series showed a healed fifth metatarsal fracture.

Treatment

I discussed with Sheree that our immediate goal would be to get her out of pain as fast as possible and improve ranges of motion to help improve all activities of daily living.

M.E.L.T

• Movement

I informed her that her treatment plan would consist of restoring the movement of her foot and ankle with chiropractic adjustments to the whole lower limb and her lumbopelvic region.

To assist Sheree with her discomfort and to ensure ongoing improved blood flow she applied MyO₂ gel and not ice to her foot every few hours.



(left) A cuboid adjustment as taught by Dr Mark Charrette DC. Contact is made on the cuboid with both hands behind your knees to create tension with an eventual thrust inferior.

• Elevate

I instructed her to elevate her foot at the end of each day to allow for the lymphatic drainage.

• Laser (Cold or Low Level)

We also elevated her foot during her laser therapy to assist in the lymphatic drainage. We put the ACTIV laser on program 3 (1,000Hz) for 2 minutes onto the inguinal lymph nodes.

We then applied the ACTIV laser on program 4 (1,000-3,000Hz) for 4 minutes over the lateral foot. This program is designed to modulate the nociceptor firing.

• Taping (Kinesio)

Finally, support for her ankle (to improve blood flow and restore her confidence to keep moving) RockTape was applied and left on for two-three days at a time.

Results

Here is Sheree's story: "Before trying cold laser therapy, the thought of being pain free seemed impossible after 2 years of constant aching, drugs & specialist appointments.

I had broken my 5th metatarsal head (comminuted fracture) a couple years ago, and the bone never completely healed. After countless physio and specialists appointments I had accepted the fact that I would have put up with the pain for the rest of my life, when I heard about cold laser.

I am on my feet all day every day for work and by the time I got home each night I was in complete agony & had to keep my feet elevated.

After just a couple of treatments my pain decreased significantly. After 6 treatments my constant aching disappeared, and I was able to stop taking meds that I had been taking for 2 years. I'm now able to go about my daily activities without suffering, something I never thought would be possible."

Discussion

Could one therapeutic intervention have worked for her? Maybe—maybe not. Based on the evidence it is clear we need to address the healing process and look for longer lasting outcomes. By focussing on the healing process it easier to involve each patient with their responsibilities in getting well. ■



Program 3: 1,000Hz
Lymphoedema
LLLT has a dilatory effect on lymphatics and can improve lymphatic drainage by 17-40% and soften fibrotic tissue. (Piller 1995)



Program 4: 1,000-3,000Hz
Pain & Muscle Spasms
This is your 'go-to' program for the first few visits. The ACTIV will deliver a high dose of LLLT for nociception modulation and relaxation of muscle spasm.



Program 5: 1-250Hz
Tissue Repair/Inflammation Assist
This program is what LLLT is all about—assisting the inflammatory cascade through to the proliferative and then remodelling phases. The important benefit here is stronger, more uniform and flexible repair tissue. (See figure 1). May assist in skin rejuvenation and intradermal collagen increase.



Program 2: 5Hz
Angiogenesis
LLLT has been shown to increase the formation of new blood vessels (Cury 2013). The chest area (over the heart) should only be irradiated at 5Hz.



Program 6: 5,000Hz
Pain Relief
The highest dose available on the ACTIV is this program that provides an inhibitory effect on muscle spasm and nociception. If a patient presents with pain on a VAS of 7+/10 this is your best program for the most potential for relief.



Program 1: 50Hz
Photohaemotherapy
Sick or injured cells demand more oxygen. Placing the ACTIV cold laser over blood vessels can increase oxygenation by up to 10% (Asimov 2012)



Visible Blue Light: 470nm
Bactericidal
The new frontier for LLLT could be the deadly effects of blue light on common bacteria such as Staph aureus and Pseudomonas aeruginosa. Choose this option for wound healing.
Currently, the ACTIV is TGA approved for musculoskeletal conditions and pain modulation and not wound healing.

MR4 ACTIV™
Portable Super Pulsed Laser Therapy
The Most Advanced Cordless Laser
A must have for health professionals and athletes alike. It provides you with a convenient, comfortable and portable tool that you can use for treatment in the training room, on the field, or on the road.