

Minor Soft Tissue Injuries may need *PEACE* in the Acute Phase, but Moderate and Severe Injuries Require *CARE*

Dear Editor-in-chief

For the past 30 years, conflicting and confusing theories have abounded for the acute-stage treatment of musculoskeletal injuries due to a lack of sufficient, high-quality research that substantiates an ideal approach. The main controversy concerns the use of cryotherapy. While cryotherapy has become established as a vital component of the initial treatment of musculoskeletal injuries as part of the rest, ice, compression and elevation (RICE) approach (Mirkin and Hoffman, 1978), doubts about its efficacy have arisen in recent years. In fact, the latest proposal is to use the protection, elevation, avoid, compression and education (PEACE) approach as acute-stage treatment of musculoskeletal injuries (Dubois and Esculier, 2020). This involves protection and elevation of the injured limb, avoidance of anti-inflammatory drugs and cryotherapy, compression of the injured limb and patient education.

The proposal to avoid cryotherapy is based on the hypothesis that ice negatively affects the healing process by delaying neutrophil and macrophage infiltration and impairing tissue repair. However, this assumption is based on the results of limited animal studies (Singh et al, 2017; Ramos et al, 2016), none of which have led to evidence-based conclusions that prove cryotherapy should be avoided. Furthermore one of these studies concluded that while ice reduced or delayed inflammation, it did not affect the healing process or recovery time (Ramos et al, 2016).

In addition, the proposal to avoid the use of cryotherapy in the acute stage of injuries has not taken into account an essential factor that impacts the choice of rehabilitative treatment: the severity of the injury. Swelling is typically minimal in minor injuries; however, significant oedema may form in a moderate to severe injury, leading to pressure on the tissues and nerves, limited movement and reduced functionality (Scott et al, 2004). Significant joint swelling is also associated with arthrogenic muscle inhibition and decreased joint functionality (Rice et al, 2009).

Each of these adverse effects of moderate and severe musculoskeletal injuries can be reduced by the immediate application of cryotherapy in the acute stage. The goal of this therapy should not be to completely avoid oedema (this is not feasible), but to reduce the extent of oedema. There is strong evidence that ice can reduce pain (Bleakley et al, 2006) and moderate evidence that cryotherapy significantly reduces oedema if applied immediately after acute trauma and improves joint range of motion (Kalli and Fousekis, 2019). Reducing swelling through cryotherapy will also reduce the secondary hypoxic injury resulting from the compression and hypoxia of healthy neighbouring structures (Ho et al, 1994).

Therefore, first, we propose that the PEACE approach (Dubois and Esculier, 2020) be used to treat minor

soft-tissue injuries that have minimal swelling. Second, we propose a new acute treatment approach for moderate and severe injuries with significant tissue damage and swelling: the cryotherapy and compression, avoid, rehabilitation and elevation (CARE) approach.

This approach consists of cryotherapy and compression, avoiding harmful movement and loading, specific rehabilitation techniques and elevation. While the evidence supporting the effectiveness of rehabilitation techniques continues to be documented and definitively proven, we must avoid the use and spread of non-evidence-based approaches. These mislead and confuse the academic, healthcare and general communities. Taking the extent of injury into account when determining acute treatment is a good step on the path to applying appropriate treatment. Based on the above, moderate and severe musculoskeletal injuries should be treated with CARE in the acute stage (Figure 1).

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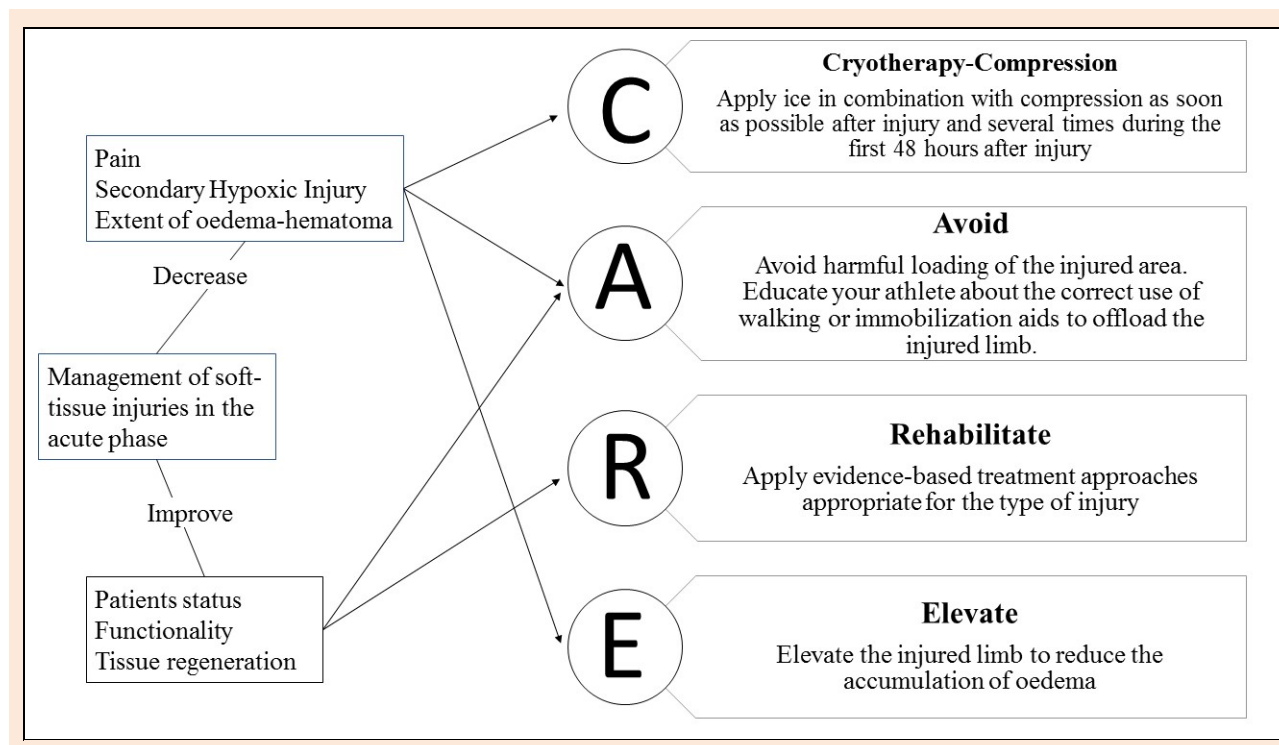


Figure 1. CARE acronym— a proposed strategy for the management of the soft-tissue injuries in the acute phase immediately after moderate to severe injury, apply techniques that will limit further damage and create conditions to accelerate healing.

C stands for cryotherapy and compression. Apply ice in combination with compression (Song et al, 2016) as soon as possible after injury and several times during the first 48 hours after injury to reduce pain, secondary hypoxic injury and extent of oedema-hematoma. **A** stands for avoid. Avoid harmful loading of the injured area. Educate your athlete about the correct use of walking or immobilisation aids to offload the injured limb.

R stands for rehabilitation. Apply evidence-based treatment approaches appropriate for the type of injury. For example, for ankle sprains, apply early weight-bearing exercises with support, manual therapy, low-level laser and progressive therapeutic exercises.

E stands for elevation. Elevate the injured limb in combination with cryotherapy and compression to reduce the accumulation of oedema.