Contrast therapy & recovery

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With the London 2012 Olympics just 15 months away, athletes will be subjecting their bodies to ever increasing levels of training loads and stresses as they strive to improve their performance and compete to their full potential at the summer games. Adequate recovery between training sessions or competition is critical to prevent over-training thus increasing the risk of sustaining an injury.

A recovery period allows time for a number of events to occur including the replenishment of the body's energy stores and a reversal of central nervous system fatigue thus allowing optimal function of the neuromuscular pathway (Sanders, 1996).

There are a number of strategies that can be employed to aid recovery after training or competition. Contrast Therapy (CT) is one such strategy, this technique involves repetitive application of cold (cryotherapy) and heat in an alternating fashion.

Initially, CT was used primarily in the management of injuries. More recently is has been utilised to aid post-exercise recovery (Cochrane, 2004). However, there appears to be insufficient evidence to support the therapeutic efficacy of CT to aid recovery. Support for the assumption that CT is an effective recovery modality appears to be mainly anecdotal.
The proposed physiological effects of using CT amongst researchers is that cryotherapy results in a decrease in muscle temperature leading to vasoconstriction of the blood vessels and a decrease in inflammation (swelling) through the slowing of metabolism metabolite production (Cochrane, 2004). Another study in support of CT indicates that heat is used to reduce pain and promote healing in soft tissue injuries (Brukner & Khan, 2002).
Although a wide range of effects have been demonstrated to support the use of CT (including changes in blood flow, reduction of inflammation, vasodilation and vasoconstriction, decreased oedema; pain and muscle stiffness) the physiological basis of CT is not adequately understood. One of the popular theories suggests that the vasodilation and vasoconstriction induced by alternating heat and cold results in a 'pumping action' that increases blood flow (Calder, 1996; Cooper & Fair, 1976).

However several authors have reported that CT does not produce the intramuscular temperature changes required to induce a 'pump' effect (Higgins & Kaminski, 1998; Wertz, 1997).
It is of interest to note that most of the research studies reviewed in gathering information for this article used physiological changes in intramuscular temperature, blood volume, heart rate, blood lactate levels and creatine kinase levels as outcome measures to test the efficacy of CT. There is some evidence that changes in these parameters may aid recovery after training or competition and may also be associated with early return to sport after an injury (Cochrane, 2004).
A comparison of the protocols in the reviewed studies highlights the differences in the method of application, the time and order of each hot (+/- 38-40°C) and cold (+/- 10-15°C) cycle as well as the total time for the recovery session. The application of CT for recovery usually involves full or half body immersion as opposed a single body part or a single limb.

Although there is anecdotal evidence that CT is effective in post exercise recovery (Cochrane, 2004), there is a lack of scientific evidence to support the use of CT for injury treatment or to aid recovery. There are also a number of questions regarding the accepted protocols for the application of CT. The differences in the temperature of the hot and cold application, the differences in the time each modality is applied for and the number of cycles will result in different outcomes in terms of both physiological and functional parameters (Wayne A. Hing, 2008). Other factors that are likely to influence the efficacy of the CT are the degree of immersion or area of coverage of a limb