

Bleakley, C.M., McDonough, S.M., MacAuley, D.C. Cryotherapy for Acute Ankle Sprains: A Randomised Controlled Study of Two Different Icing Protocols. *Br.J Sports Med.*2007;40:700-705.

The purpose of this study is to investigate the effectiveness of cryotherapy in the treatment of soft tissue injuries, specifically acute ankle sprains, within the previous 48hours of injury. This research has been done due to the lack of evidence-based research to support the clinical practice of ice treatments for acute soft tissue injuries. Furthermore, research has been flawed, varied in its design, and hasn't addressed the question of efficiency between differing cryotherapy protocols.

A pilot study had been done to determine sample size. Eighty-nine subjects (58 male,31 female, mean 29.9y.o.) were recruited from a university and hospital setting. Inclusion criteria included having sustained an ankle sprain within the prior 48hrs. A three point grading scale determined the degree of injury severity. Exclusion criterion included a positive anterior drawer or talar tilt, subjects<16y.o., an osseous injury, multiple injuries, or cold related conditions. Subjects were randomized into an intermittent treatment group, or standard protocol group. The groups were stratified by sports-related and general population injury. Researchers were blinded to group assignment, with the primary investigator blinded until data analysis. Cryotherapy was standardized by freezing ice bags filled with water, holding the frozen bag under running water for 30sec., and wrapping it with a single layer of towel before self-application. Subjects were given both verbal and written instructions. Standard treatment was a 20min continuous application performed every 2 hrs. The intermittent group applied ice for 10min., removed the ice for 10min., and reapplied for 10 minutes to be repeated every 2 hours. Both groups did this for the first 72 hours of injury. Compliance was monitored through the use of a treatment diary reviewed after 1wk. Subjects were also asked to perform ankle mobility, calf stretching, and basic proprioception exercises for the first week. At baseline, one, two, three, four, and six weeks, the following were assessed: function (Binkley's lower extremity functional scale), pain (10cm VAS scale), and swelling (figure of eight method). SPSS was used for data analysis with a within subjects RMANOVA done to determine change over time between groups. A within subjects repeated measures analysis of covariance was done to control for subject baseline levels and change in time points. Significance was set to 0.05 and the Greenhouse-Geisser procedure was applied, as well as Bonferroni adjustments.

Nineteen subjects were lost and results revealed no difference between groups at baseline for pain, swelling, or ankle function. Over all follow up times, swelling, pain at rest, and function significant improvements were made over time, but there was no relationship between time and group. Decreases in pain over time were significant as well as between group and time. Pain significantly reduced ($p<0.017$) from baseline to the first week for the intermittent group.

The strength of recommendations using the SORT is an A due to the good-quality patient-oriented evidence. This study is an original work of research that randomized their investigators in conducting the experiment against a control group (or gold standard). This article's level of evidence was determined with the *AAOS Levels of Evidence for Primary Research Question*. AAOS level 1. This research also receives a Critical Appraisal Checklist Score of 42/48. This is valuable information in clinical practice as pain is often a patient's chief complaint. If a clinician is able to reduce pain sooner than normal, functional activity may be able to begin sooner for a potentially earlier return-to-play. It is therefore important to educate the patient on the specific details of home care, and the precise manner in which they should ice their injury for the first week for optimal pain relief.

