

## **AT614: Foundations of Sports Injury Rehabilitation Annotated Rehabilitation Evidence Assignment #2**

French SD, et al. Superficial heat or cold for low back pain. *Cochrane Database of Systematic Reviews*. 2008; 1-73.

Between 11%-84% of individuals experience low-back pain (LBP) in their lifetime. While the cause of LBP is often insidious and non-specific, it can be a costly and disabling ailment. Despite the prevalence of LBP and the inexpensive nature and ease of administration of ice and heat, the most beneficial treatment method of reducing LBP has not been identified. The purpose of this systematic review was to determine the efficacy of superficial heat and cold therapies in reducing pain and disability from LBP in adults.

Studies considered for review included randomized controlled trials and non-randomized controlled clinical trials with participants who were over the age of 18 with non-specific low-back pain. Trials that included participants with pathological causes of LBP and LBP with radiculopathy were excluded. The duration of LBP was defined as acute (less than 6 weeks), sub-acute (6-12 weeks), or chronic (longer than 12 weeks). Trials utilizing co-interventions were only included if the co-interventions were similar across comparison groups. Trials were included that used at least one of five outcome measures: pain (measured by VAS), disability (measured by Oswestry, Roland Disability Scale), overall improvement, patient satisfaction, and adverse affects. The primary outcomes for this review were pain and physical functional status. Databases used to search for relevant literature include: The Cochrane Controlled Trials Register, MEDLINE, EMBASE, CINAHL, PEDro, Back Review Group Specialized register, SPORTDiscus, and OVIDMEDLINE. Once relevant abstracts were collected, two authors independently extracted data onto a standard form that had been piloted, and independently assessed the quality of the data according to Cochrane Back Review Group criteria.

Nine trials involving 1117 participants were appropriate for inclusion. In two trials, heat therapy significantly reduced pain after five days compared to oral placebo. One trial found that a heated blanket significantly decreased acute LBP immediately after applying. One trial examining the effects of adding exercise to heat wrap found it reduced pain for 7 days. There was insufficient evidence to evaluate the effects of cold for LBP. According to the AAOS, the level of evidence is consistent with Level II. The strength of recommendation (SORT) is a level (2)B study. Total quality of the systematic review was 25/48.

LBP is certainly not uncommon in the athletic population that athletic training clinicians treat. However, LBP seen in this population is often pathological in nature and may involve radiculopathy – two variables that were criteria that led to exclusion of articles in this systematic review. Despite the lower quality of the studies included in this review, heat therapy seemed to have positive patient-oriented outcomes in the majority of the studies. Despite the lack of overly-compelling evidence, based on the results of the study by Mayer, I do believe it is important to educate athletes on the importance of complying to a comprehensive rehabilitation program for any given pathology. Often, young athletic patients in the secondary school setting expect that one specific modality alone will provide long-term benefits or improve healing time. Rather than discourage the use of heat alone, athletic training clinicians can educate their patients on the importance of employing a flexibility program or other therapeutic exercises (depending on the nature of the LBP) to decrease pain and disability that may be associated with LBP.

## Critical Appraisal Worksheet: Systematic Reviews

### 1. Why was the study done (what was the research question)?

The study was performed because low-back pain is a common source of discomfort, with a prevalence ranging from 11-84%. LBP can be a seriously disabling condition with financial ramifications on individuals and society. Because the use of superficial heat is common and inexpensive in health care practice, this study was pursued as a means of determining the most beneficial modality of the two in reducing pain according to a number of patient-oriented outcomes.

### 2. Is it a systematic review of high-quality studies which are relevant to your question?

This systematic review includes a number of lesser-quality randomized controlled and clinical trials. Only 2/9 of the included studies had appropriate sequence generation; 1/9 studies had allocation concealment; none had blinding of patients/providers (because it was not feasible w/ thermo-therapy); 4/9 blinded the outcomes assessors; 7/9 addressed the issue of subject attrition; 3/9 had ITT analysis; 5/9 studies had similar baseline characteristics; in 6/9 studies co-interventions were avoided or similar; in 3/9 studies compliance was acceptable; in 8/9 studies the timing of outcomes assessment was similar.

### 3. Did it describe a comprehensive search for all relevant studies?

Yes; databases used to search for relevant literature include: The Cochrane Controlled Trials Register, MEDLINE, EMBASE, CINAHL, PEDro, Back Review Group Specialized register, SPORTDiscus, and OVIDMEDLINE. The search strategy was based on recommendations by the Cochrane Back Review Group.

### 4. Were the criteria for study inclusion predetermined and clearly stated?

Yes; the types of studies included were randomized controlled trials (RCTs) and non-randomized controlled clinical trials (CCTs) comparing superficial heat or cold therapy to placebo, no therapy, or to other therapies. Studies included participants 18 years old and above, with the complaint of low-back pain. Trials that included participants with mechanical causes of LBP and LBP with radiculopathy were excluded. Trials were included in which superficial heat or cold therapy was administered to at least one group within the trial. Trials in which co-interventions were given were only included if the co-interventions were similar across comparison groups. If co-interventions were given, trials were excluded if we could not isolate the effects of heat or cold from the effects of other therapies delivered. Trials were included that used at least one of the five outcomes considered to be important in LBP research: pain (measured by the VAS), disability/function (measured by Oswestry, Roland Disability Scale), overall improvement, patient satisfaction, and adverse effects. The primary outcomes for this review were pain and physical function status.

### 5. Did the authors adequately assess the quality of the included studies?

Yes, in Table 1 of the systematic review, the authors address the criteria for the Risk of Bias Assessment. These criteria include method of randomization; concealment of treatment allocation; blind of patients, care provider, outcomes assessor; drop-out rate; inclusion of ITT analysis; group characteristics at baseline; presence of co-interventions; patient compliance; and

timing of outcome assessments in all groups. The findings of these criteria were summarized for all studies in Figure 1.

#### **6. What were the results of the review?**

Nine trials involving 1117 participants were appropriate for inclusion. In two trials of 258 participants with a mix of acute and sub-acute LBP, heat wrap therapy significantly reduced pain after five days (WMD 1.06, 95% confidence interval 0.68-1.45, scale range 0-5) compared to oral placebo. One trial of 90 participants with acute LBP found that a heated blanket significantly decreased acute LBP immediately after application (WMD -32.20, 95% CI -38.69 to -25.71, scale range 0-100). One trial of 100 participants with a mix of acute and sub-acute LBP examined the effects of adding exercise to heat wrap found it reduced pain for 7 days. There was insufficient evidence to evaluate the effects of cold for LBP and conflicting evidence for any differences between heat and cold for LBP.

#### **7. How precise are the results?**

Because the quality of the studies are only moderate-fair, the results of the systematic review cannot be considered highly precise.

#### **8. Did the interpretation of the review's results accurately reflect the results themselves? Are the results generalizable?**

Yes; the authors' provided a thorough and accurate analysis of the included studies, resulting in an accurate depiction of the worth of the study results. The results are generalizable to a population that meets the inclusion criteria of the studies, that is, adults 18 years old and above who are suffering from LBP as described in the systematic review.