Pulsed electromagnetic field therapy and osteoarthritis of the knee: synthesis of the literature
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CRD summary
This review concluded that pulsed electromagnetic fields might be effective in reducing pain and dysfunction associated with osteoarthritis of the knee. Only a summary of the individual trial results was provided and the difference between the intervention and control group was not clearly reported for all trials. This means that it is not possible to properly assess the conclusions.

Authors' objectives
To describe the results of efficacy studies on the application of therapeutic pulsed electromagnetic fields to patients with varying severity of knee joint osteoarthritis.

Searching
MEDLINE (1966 to 2005), EMBASE (1982 to 2005), AMED (1996 to 2005), and CINAHL (1966 to 2005) databases were searched for articles in English.

Study selection
Randomised controlled trials (RCTs) assessing the effectiveness of the application of pulsed electromagnetic fields to knee joints with osteoarthritis were included in this review.

The intervention characteristics varied widely across trials; session duration ranged from six minutes to one hour, the number of sessions ranged from eight to 84, and the frequency of administration ranged from three times daily to three-to-five times per week. Control groups were treated with low frequency electromagnetic fields, sham treatment, or placebo. The primary outcomes were the Lequesne index, Western Ontario and McMaster Universities (WOMAC) Osteoarthritis Index, reduction in overall pain measured on the Visual Analogue Scale, and other functional outcome measures, such as usual gait speed and stride length.

The authors did not state how many reviewers selected papers for the review.

Assessment of study quality
The Delphi list criteria were used to assess trial quality. Items included randomisation, allocation concealment, similarity of groups at baseline, and blinding.

The authors did not state how the validity assessment was performed.

Data extraction
The authors extracted a summary of the results for each trial. They did not state how many reviewers extracted the data.

Methods of synthesis
The patient and intervention characteristics and trial findings were summarised in a table and the results were combined in a narrative synthesis.

Results of the review
Seven RCTs (n=528 patients; range 27 to 176) were included. The overall quality was described as adequate and scores ranged from five to eight. There was a wide variation in patient populations, intervention strategies, outcome measures, and length of follow-up across the trials.

The authors stated that pulsed electromagnetic fields consistently showed positive benefits in pain reduction and
improved mobility, over and above the strong placebo effect.

**Authors' conclusions**
The application of pulsed electromagnetic fields might be helpful in relieving knee pain and improving function for people with knee osteoarthritis.

**CRD commentary**
The objectives were broad in the different aspects they covered. The inclusion criteria for efficacy trials were clearly specified for trial design and intervention, but not for the patient population. Unpublished trials were not specifically sought and there was a risk of publication bias. Only articles in English were eligible and some relevant articles published in other languages might have been missed. The details of the review process, such as how many reviewers assessed the trials for inclusion and quality and performed the data extraction, were poorly reported, which means it is difficult to determine whether appropriate steps were taken to minimise bias and errors. Given the wide differences between trials, a narrative synthesis was appropriate.

Only a summary of the individual trial results was provided. The difference between the intervention and control group was not clearly reported for all the trials and there was undue emphasis on changes within the intervention group. This means that it is not possible to properly assess the conclusions.

**Implications of the review for practice and research**

**Practice**: The authors did not state any implications for practice.

**Research**: The authors stated that large double-blind randomised controlled trials were required to assess the efficacy of pulsed electromagnetic fields when combined with other physical therapy modalities, their application in patients undergoing prosthetic knee replacement for osteoarthritis, and the most effective wave form characteristics. The chondroprotective, bone repair, and anti-inflammatory properties of the therapy also required further study.

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**Other publications of related interest**
This published commentary may also be of interest.


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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.