POINT/COUNTERPOINT

Suggestions for topics suitable for these Point/Counterpoint debates should be addressed to Colin G. Orton, Professor Emeritus, Wayne State University, Detroit: ortonc@comcast.net. Persons participating in Point/Counterpoint discussions are selected for their knowledge and communicative skill. Their positions for or against a proposition may or may not reflect their personal opinions or the positions of their employers.

Despite widespread use there is no convincing evidence that static magnets are effective for the relief of pain

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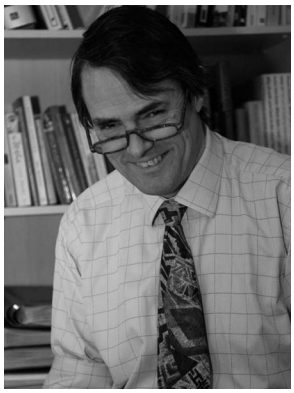
OVERVIEW

Magnets have been used to relieve pain for over 4000 years. The use of magnets for pain relief in Chinese medicine dates back to about 2000 B.C., Aristotle and Plato both talked of the benefits of lodestone for pain relief, and the great physicist Michael Faraday published extensively about the healing effects of magnetic fields. Currently, millions of people worldwide (and probably hundreds of medical physicists!) use static magnetic fields in some form or other for pain relief. However, many experts believe that there are no physical or biological mechanisms to explain any value of these devices for the relief of pain and no clinical evidence to support their use. This is the topic discussed in this month's Point/Counterpoint.

Arguing for the Proposition is Max H. Pittler, M.D., Ph.D. Dr. Pittler earned his M.D. (Applied Physiology) from the University of Freiburg, Germany, and his Ph.D. (Medical Sciences) from the Universities of Exeter and Plymouth, United Kingdom. Currently he is Deputy Director and Senior Research Fellow, Complementary Medicine, Peninsular Medical School, Universities of Exeter and Plymouth. His main research interests relate to complementary medicine: studies of effectiveness and safety, the design and conduct of clinical trials, meta-analyses, and systematic reviews. He is the author or coauthor of several books and over 100 papers in peer-reviewed journals.



Arguing against the Proposition is Tim Harlow, MB ChB. Dr. Harlow studied Zoology before Medicine and, until 2002, practiced as a family doctor in Cullompton, a market town in Devon, England. For the last 5 years he has worked in Palliative Care. He has been interested in complementary therapies and has published research in this area. He helped establish the Master's Degree Program in Integrated Healthcare at the Peninsula Postgraduate Health Institute, Universities of Exeter and Plymouth, and has led the module on Different Paradigms of Healthcare. He was elected to the Ethics Committee of the Association of Palliative Medicine in 2004.

FOR THE PROPOSITION: Max H. Pittler, M.D., Ph.D.

Opening Statement

I base my case in support of the proposition on the results of a review my colleagues and I conducted in which we systematically searched the literature in numerous data sources and demonstrated that there is no convincing evidence to support the use of static magnets for the relief of pain.[1] All randomized clinical trials of static magnets for treating pain from any cause were considered. Trials were included only if they involved a placebo or a weak magnet as the control, with pain as an outcome measure. Twenty-nine potentially relevant trials were identified. For a subset of

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these trials, pain was assessed on a 100-mm visual analog scale. For these nine trials a meta-analysis was performed.

Meta-analysis of the nine trials that assessed pain indicated no significant difference in pain reduction between the magnet and placebo groups (weighted mean difference 2.1 mm, 95% CI −1.8–5.9 mm, $p=0.29$). The χ^2 test for heterogeneity indicated that the observed differences between trial results were unlikely to have been caused by chance ($\chi^2=9.03$, degrees of freedom=8, $p=0.34$; $I^2=11.4\%$). For peripheral joint osteoarthritis the evidence is insufficient to exclude a clinically important benefit that creates an opportunity for further investigation. For all other conditions, there was no convincing evidence to suggest that static magnets might be effective for pain relief. Given the possibility of small effects, if any, that cannot be excluded on the basis of the evidence, further study is warranted.

Across all trials there was no convincing indication that high-strength magnets performed any better than low-strength magnets. Positive and negative studies were spread across magnet strengths, and the results reveal neither an optimal magnet strength nor a "window of time" when magnet therapy is effective for treating pain.

The strengths of our systematic review pertain to its rigor in terms of searching the literature, inclusion and exclusion criteria, and data assessment. Our analyses of data from randomized controlled trials have yielded a relatively robust indication of the effects of magnets on pain outcomes, although further trials are still required. We searched databases with a focus on the U.S. and European literature, as well as specialist data sources, and included hand searches in relevant journals, with no restriction in terms of publication language.

In conclusion, the evidence does not support the use of static magnets for pain relief, and such magnets therefore cannot be recommended as an effective treatment. For osteoarthritis, the evidence is insufficient to exclude a clinically important benefit, which creates an opportunity for further investigation.

AGAINST THE PROPOSITION: Tim Harlow, MB ChB.

Opening Statement

There are two related but separate points implicit in this title that can, unfortunately for doctors and their patients, be conflated. First are the fascinating questions about underlying physiological mechanisms, our understanding of these, the validity of placebos in trials, and expectation effects. The second point, the pragmatic usefulness or otherwise of static magnets in alleviating pain, whatever our understanding of the underlying model, is also very important.

There is disagreement in both of these areas. A view exists that the lack of consistent evidence from randomized trials and the lack of a plausible physiological mechanism are enough to discourage the use of static magnets as an effective treatment for pain relief.[1,2] This conclusion has shades of "guilty until proved innocent." But there is evidence to provide support for those who might recommend static magnets.[3,4]

There is no widely accepted model of how static magnets might work at a physiological level, and some investigators go so far as to suggest theoretically that "magnet therapy seems unrealistic."[2] However, there are two considerations before we rush to accept that assertion. First, the idea that an electrically conducting solution (blood) filled with many different ions moving through a magnetic field might experience physiological effects does not seem inherently implausible. Interestingly, the evidence for electromagnetic fields (not static magnets) being useful in bone healing seems compelling.[5] Second, we always know less than we think we do and there may be other mechanisms we do not yet know. The sun glowed quite satisfactorily and natural selection proceeded apace for a long time before we understood anything of the mechanisms underlying either. To consider something impossible simply because we do not yet understand it is hubris.

The pragmatic argument is strong—patients using static magnets for relief of pain have been shown to report significantly less pain than those with dummy magnets.[6] This pragmatic approach can be criticized as merely a placebo effect, as if the real pain relief experienced somehow does not count, as if it is cheating! We know the placebo effect is strong.[7] Yet, even if it were entirely a placebo effect, static magnets would still be an effective treatment for the relief of pain and certainly would be far safer than conventional drugs.

I know practicing physicians who are unable to produce a rationale for static magnet use but still will not part with their own magnetic bracelet because they find it helps. How then should we advise patients? I believe we should give them the information to choose:

- in the absence of a pacemaker or insulin pump, magnet therapy may be a safe although poorly understood mechanism,
- there is certainly considerable activation of placebo and expectation response, and
- beyond that–uncertain.

The clinical equipoise is to advise patients that if they use adequate strength static magnets (≥180 mT) they are likely to experience less pain than if they do not. And if they choose a reputable vendor with a money back guarantee then they have nothing to lose but their pain.

Rebuttal: Max H. Pittler, M.D., Ph.D.

Practicing evidence-based medicine requires integrating individual health care expertise, the patient's circumstances, and the best available clinical evidence from systematic research.[8] The best available, most current evidence from a systematic review and meta-analysis suggests that there are no significant effects of static magnets for pain relief relative to a placebo. Therefore, the evidence does not support the use of static magnets for pain relief.[1] All previous reviews become irrelevant in the face of new and more rigorous sys-

tematic reviews, and selective quotations of single, handpicked trials are not helpful when it comes to questions on how to advise patients. Clearly, placebo effects are beneficial but they are not specific to magnets and do not require magnets. In fact, they come with every medical intervention and they are usually free of cost. Promoting placebo treatment is counterproductive. It is expensive; costs the patients and, in some countries, the taxpayer; undermines rational thinking; and opens the door to a plethora of quack treatments. Patients should be advised that magnets are not more effective than placebos and that they should save their money. Perhaps general practitioners should spend more time with their patients and be more empathetic rather than recommending magnets.

Rebuttal: Tim Harlow, MB ChB.

Dr. Pittler has admirably paraphrased his excellent paper[1] reviewing the evidence in this matter. He clearly sets out one, narrow, way of looking at the issue. Those who have been closely involved in research in this area are fully aware of the great difficulties inherent in trying to perform definitive studies in this field. However, the evidence still suggests that those who use strong static magnets report significantly less pain in some real-life situations than those who do not use them—whatever the mechanism.[6]

Many conventional treatments, such as nonsteroidal anti-inflammatory drugs, cause serious side effects and will kill some patients. We realize that there are very few and relatively minor side effects associated with static magnets. Some patients do find them effective for the relief of pain and frequently tell their doctors so. I cannot agree with Dr. Pittler's assertion that such magnets cannot be recommended as an effective treatment: they are effective and we should recommend them to our patients.

The arguments I outlined in the opening statement and now emphasize still seem to me compelling despite Dr. Pittler and colleagues' review of the evidence. Infinitely more compelling is the fact that, after we had both agreed to take part in this debate and I had written my opening statement, Dr. Pittler requested a change in the title he was to defend. Out went the pragmatic original Proposition: "Despite widespread use static magnets are not effective for the relief of pain" and in came a much more cautious "Despite widespread use there is no convincing evidence that static magnets are effective for the relief of pain." Obviously Dr. Pittler realized that his meta-analysis does not prove beyond question that magnets do not relieve pain, only that the evidence for relief of pain is not "convincing." Patients who experience pain relief with magnets would not be so convinced.

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