

Can Magnets Help Reduce Pain?

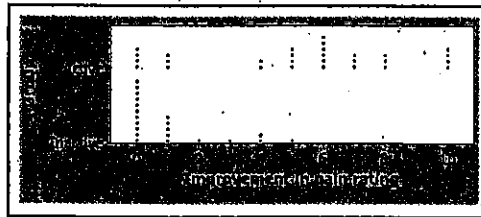
Early research showed that magnetic fields affected living tissue in humans. Some doctors have begun to use magnets to treat patients with chronic pain. Scientists wondered whether this type of therapy really worked. They designed a study to find out.

Fifty patients with chronic pain were recruited for the study. A doctor identified a painful site on each patient and asked him or her to rate the pain on a scale from 0 (mild pain) to 10 (severe pain). Then, the doctor selected a sealed envelope containing a magnet at random from a box with a mixture of active and inactive magnets. That way, neither the doctor nor the patient knew which type of magnet was being used. The chosen magnet was applied to the site of the pain for 45 minutes. After "treatment", each patient was again asked to rate the level of pain from 0 to 10.

In all 29 patients were given active magnets and 21 patients received inactive magnets. Scientists decided to focus on the improvement in patients' pain ratings. Here they are, grouped by the type of magnet used:

Active:	10	6	1	10	6	8	5	5	6	8	7	8	7	6	4	4	7	10	6	10	6	5	5	1	0	0	0
Inactive:	4	3	5	2	1	4	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1					

1. Why is this study an experiment, not an observational study?
2. What type of design was used in this experiment? Identify the experimental units, the treatments, and the response variable.
3. There are two distinct purposes for having the doctors select a sealed envelope at random from the box. Describe them both.
4. The dotplot shows the improvement in pain ratings for both groups. Write a few sentences comparing the two distributions.



5. The mean difference in pain ratings was 5.24 for the active-magnet group and 1.10 for the inactive-magnet group. The difference was statistically significant. What conclusion should we draw?