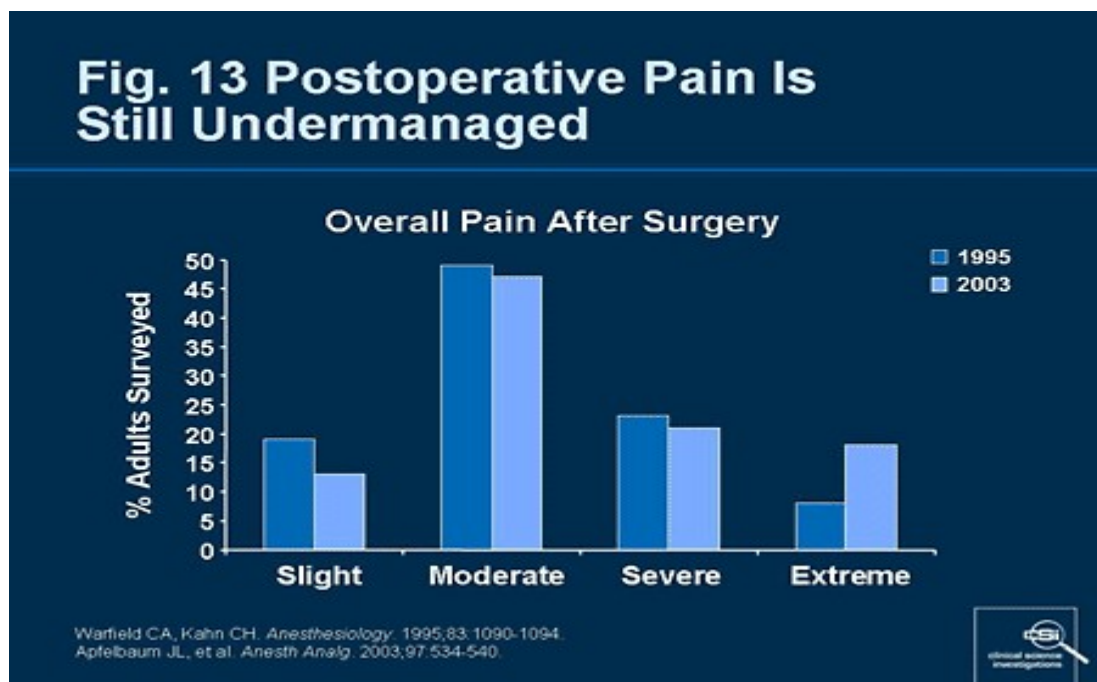


Medical PEMF Studies



WOUND HEALING

Effects of pulsed electromagnetic fields on interleukin-1 beta and postoperative pain: a double-blind, placebo-controlled, pilot study in breast reduction patients.



1. *Plast Reconstr Surg*. 2010 Jun;125(6):1620-9.

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Comment in

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BACKGROUND: Surgeons seek new methods of pain control to reduce side effects and speed postoperative recovery. Pulsed electromagnetic fields are effective for bone and wound repair and pain and edema reduction. This study examined whether the effect of pulsed electromagnetic fields on postoperative pain was associated with differences in levels of cytokines and angiogenic factors in the wound bed.

METHODS: In this double-blind, placebo-controlled, randomized study, 24 patients, undergoing breast reduction for symptomatic macromastia received pulsed electromagnetic field therapy configured to modulate the calmodulin-dependent nitric oxide signaling pathway. Pain levels were measured by a visual analogue scale, and narcotic use was recorded. Wound exudates were analyzed for interleukin (IL)-1 beta, tumor necrosis factor-alpha, vascular endothelial growth factor, and fibroblast growth factor-2.

RESULTS: Pulsed electromagnetic fields produced a 57 percent decrease in mean pain scores at 1 hour ($p < 0.01$) and a 300 percent decrease at 5 hours ($p < 0.001$), persisting to 48 hours postoperatively in the active versus the control group, along with a concomitant 2.2-fold reduction in narcotic use in active patients ($p = 0.002$). Mean IL-1 beta concentration in the wound exudates of treated patients was 275 percent lower ($p < 0.001$). There were no significant differences found for tumor necrosis factor-alpha, vascular endothelial growth factor, or fibroblast growth factor-2 concentrations.

CONCLUSIONS: Pulsed electromagnetic field therapy significantly reduced postoperative pain and narcotic use in the immediate postoperative period. The reduction of IL-1 beta in the wound exudate supports a mechanism that may involve manipulation of the dynamics of endogenous IL-1 beta in the wound bed by means of a pulsed electromagnetic field effect on nitric oxide signaling, which could impact the speed and quality of wound repair.

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