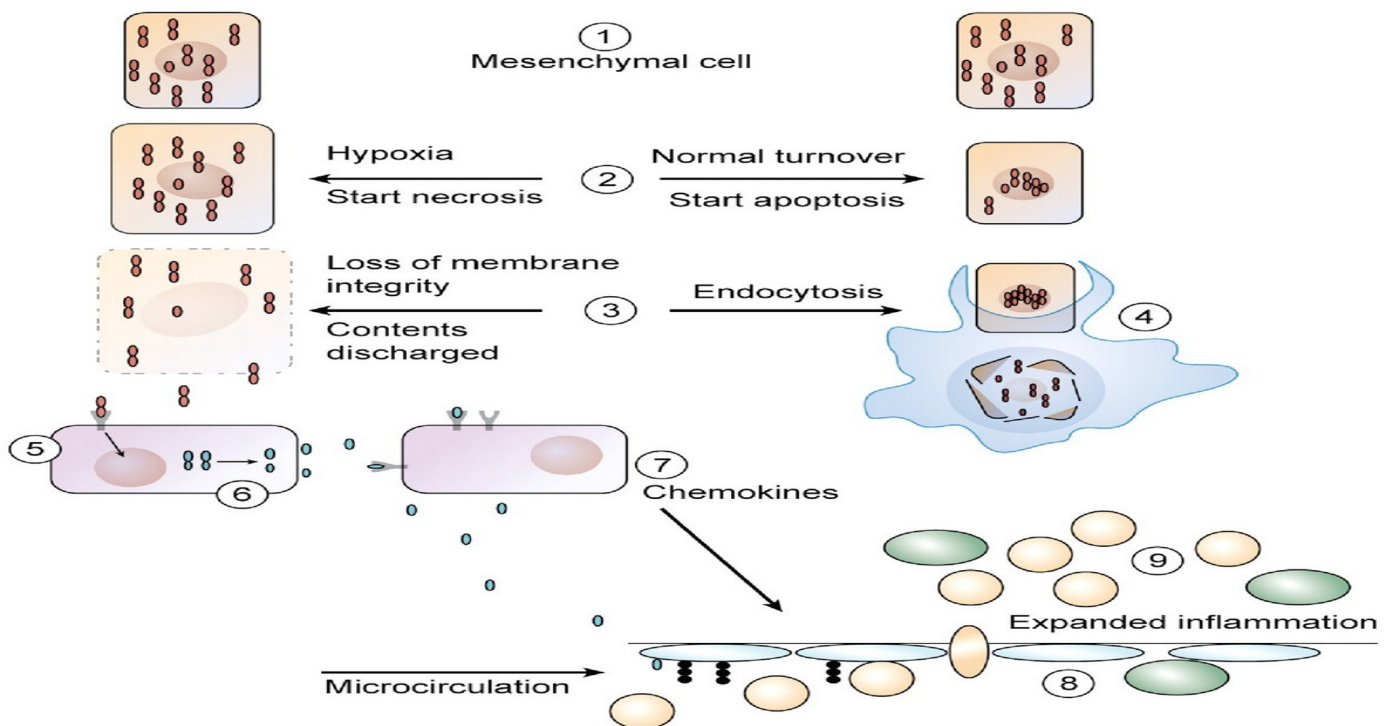


Medical PEMF Studies



WOUND HEALING

Pulsed Electromagnetic Fields Reduce Postoperative Interleukin-1 β , Pain, and Inflammation: A Double-Blind, Placebo-Controlled Study in TRAM Flap Breast Reconstruction Patients.



1. *Plast Reconstr Surg.* 2015 May;135(5):808e-817e. doi: 10.1097/PRS.0000000000001152.

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BACKGROUND: Pulsed electromagnetic fields have been shown to reduce postoperative pain, inflammation, and narcotic requirements after breast reduction and augmentation surgical procedures. This study examined whether pulsed electromagnetic field therapy could produce similar results in patients undergoing unilateral transverse rectus abdominis myocutaneous (TRAM) flap breast reconstruction, a significantly more complex and painful surgical procedure.

METHODS: In this double-blind, placebo-controlled, randomized study, 32 patients undergoing unilateral TRAM flap breast reconstruction received active or sham pulsed electromagnetic field therapy. Pain levels were measured by using a visual analogue scale; narcotic use and wound exudate volume were recorded starting 1 hour postoperatively. Wound exudates were analyzed for interleukin-1 β .

RESULTS: Mean visual analogue scale pain scores were 2-fold higher in the sham cohort at 5 hours and 4-fold higher at 72 hours ($p < 0.01$), along with a concomitant 2-fold increase in narcotic use in sham patients ($p < 0.01$). Wound exudate volume was 2-fold higher in the sham cohort at 24 hours ($p < 0.01$), and mean interleukin-1 β concentration in wound exudates of sham patients was 5-fold higher at 24 hours ($p < 0.001$).

CONCLUSIONS: Pulsed electromagnetic field therapy significantly reduced postoperative pain, inflammation, and narcotic use following TRAM flap breast reconstruction, paralleling its effect in breast reduction patients. Both studies also report a significant reduction of interleukin-1 β in the wound exudate, supporting a mechanism involving a pulsed electromagnetic field effect on nitric oxide/cyclic guanosine monophosphate signaling, which modulates the body's antiinflammatory pathways. Adjunctive pulsed electromagnetic field therapy could impact the speed and quality of wound repair in many surgical procedures.

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, I.

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