

## PEMF Therapy Rapidly Reduces Post-operative Pain in TRAM flap Patients

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### Abstract

**Background:** Autologous breast reconstruction utilizing an abdominal donor site can result in significant and prolonged post-operative pain, which prolongs surgical recovery. This study investigates whether non-invasive pulsed electromagnetic field (PEMF) therapy, shown to rapidly reduce pain after breast reduction without the cost and side effects of narcotic pain medications (1), can produce similar outcomes in more complex transverse rectus abdominus myocutaneous (TRAM) flap breast reconstructions.

**Methods:** In this double-blind, randomized, placebo-controlled pilot study, 19 patients undergoing pedicled TRAM flaps received either placebo or PEMF therapy immediately post-op. The non-invasive PEMF signal was pulse-modulated 27.12 MHz, configured to modulate nitric oxide signaling (2). PEMF therapy was identical for both the abdominal donor site and the breast flap and was delivered via disposable devices (Ivivi Health Sciences, San Francisco) continuously for 15 min every 2 hours. All patients were given as needed patient-controlled analgesia for the first two days post-op, followed by oral pain medications. Pain levels were measured via visual analog scale (VAS), and narcotics were quantified as Percocet equivalents.

**Results:** Mean VAS scores in the active cohort decreased approximately 6-fold faster ( $P < 0.001$ ) than those in the sham cohort during 72 hours of intermittent PEMF therapy; placebo pain scores were double those of treatment scores at 5 hours post-op, and 8-fold higher at 72 hours post-op ( $P < 0.001$ ) (Figure 1).

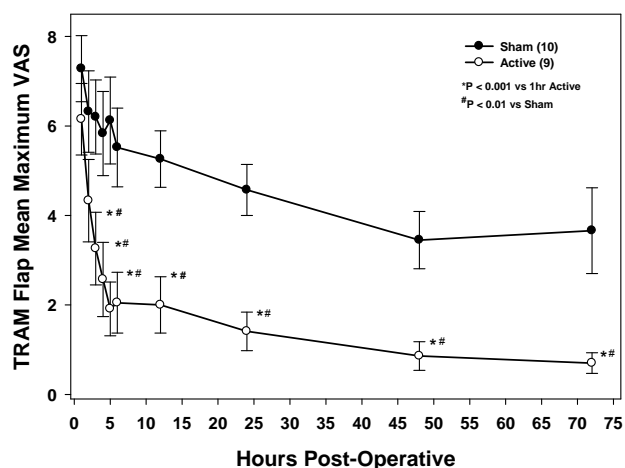


Figure 1. PEMF effect on VAS score in TRAM patients

Total Percocet equivalent pill count was nearly 2.5-fold higher in the placebo group vs the therapy group by 72 hours post-op ( $P=0.003$ ) (Figure 2).

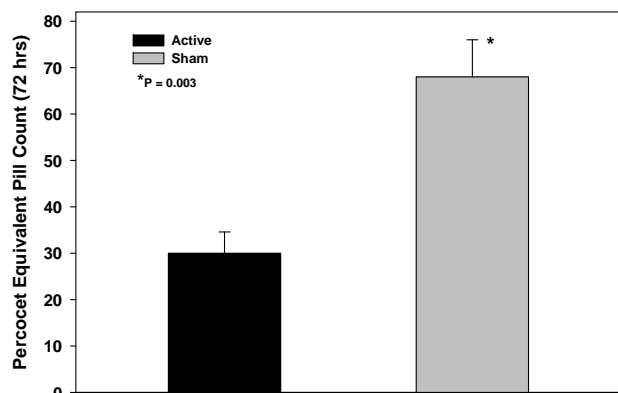


Figure 2. PEMF effect on narcotic use in TRAM patients

**Conclusions:** PEMF therapy was effective in rapidly reducing post-operative pain and use of narcotic medications in TRAM patients, suggesting PEMF can be effective for pain management in both simple and complex surgeries.

#### **References**

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