

Pulsed Shortwave Therapy to Treat Postamputation Pain: A Randomized, Double-Masked, Sham-Controlled, Crossover Pilot Study

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Introduction

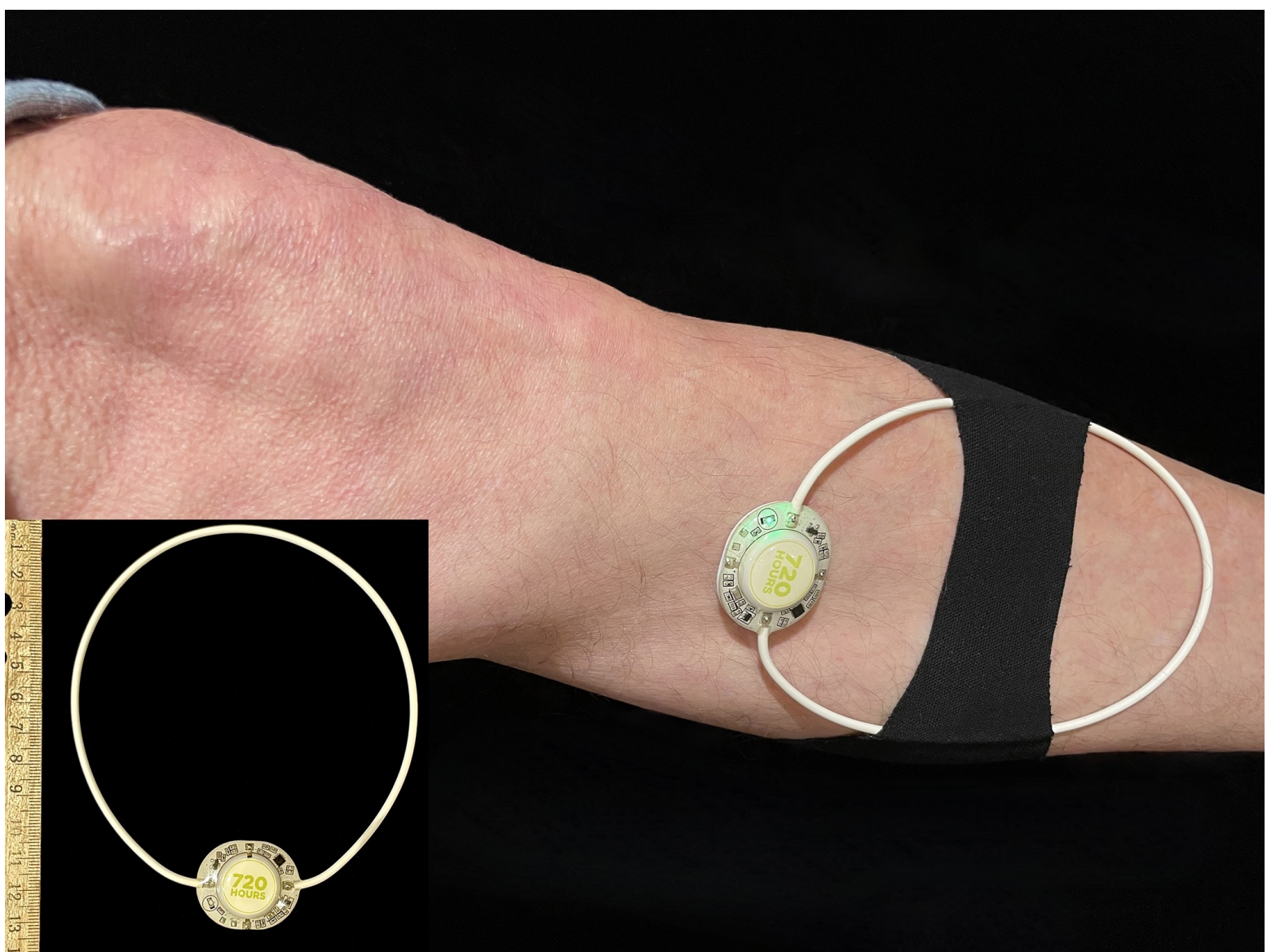
- Postamputation phantom and residual limb pain are difficult to treat
- Ultrasound-guided continuous peripheral nerve blocks and percutaneous peripheral nerve stimulation have had limited success
- Pulsed shortwave therapy has been used for over 7 decades to treat chronic and acute pain conditions, decrease postoperative inflammation and edema, and hasten bone regeneration and wound healing
- Initially, devices were large and bulky, but modern advancements have led to portable, lightweight, battery-operated, single-use, wearable devices cleared by the FDA

Methods

- One enrolling center (clinicaltrials.gov 05392803)
- Participants: Adults with a lower limb amputation and daily phantom and/or residual limb pain
- Stimulator adhered to around the distal end of their residual limb or positioned at the end of the limb
- Randomized to 28 days of either active stimulation or sham in double-masked fashion
- Lead applied and removed by patients at home followed by a crossover treatment beginning on day 35
- Primary outcomes: (1) change in "average" residual and phantom limb pain scores between baseline and Day 28 using the Numeric Rating Scale; (2) and the Patient Global Impression of Change on Day 28

Results

- N=14 [Ilfeld. *Reg Anesth Pain Med*, In Press]
- Median [IQR] after 28 days for phantom pain decreased by: active **2** [0, 5.5] versus **0** [-0.3, 0] for sham; residual pain decreased by: active **2.5** [0, 5.3] versus **0** [-0.5, 0] for sham
- Median [IQR] patient global impression of change after 28 days for phantom pain: active **6.0** [4.0, 7.0] versus **4.0** [4.0, 4.0] for sham; residual pain: active **5.5** [4.0, 7.0] versus **4.0** [4.0, 4.0] (4=no change, 7=very much improved)



Conclusions

- Noninvasive, nonpharmacologic, pulsed shortwave (radiofrequency) therapy reduces postamputation phantom and residual limb pain and improves physical and emotional functioning during use of the devices

