FROM PAIN TO HEALING: A CASE SERIES OF COMPLEX WOUNDS TREATED WITH SUB-SENSORY ELECTRICAL STIMULATION THERAPY (ACCEL-HEAL SOLO*)

Authors: Francesca Russell [1], Liz Ovens [2]
Affiliations: [1] Senior Tissue Viability Nurse, Abingdon Community Hospital, Oxford, UK; [2] Independent Tissue Viability Specialist Nurse, UK

NHS Oxford Health NHS Foundation Trust

Introduction

Inadequate control of wound-related pain may hinder patient engagement with treatment and, in some cases, lead to illicit substance use for self-medication. This case series explores the use of sub-sensory electrical stimulation therapy (EST)* as an adjunctive intervention for pain relief and wound healing.

Method

Three patients with painful, non-healing wounds of differing complex aetiologies received a 12-day course of EST (Accel-Heal Solo*) and were followed up for 12 weeks. Wound dimensions, pain scores (visual analogue score [VAS, 0= no pain- 10= worst pain]) and Quality of Life (QoL) [1] were measured prior to and following application of EST*. Patient consent was obtained. Patient names have been changed.

Discussion and Conclusion:

The use of EST* helped to reduce wound-related pain enabling patients to tolerate gold standard wound treatments including debridement, off-loading strategies (for PU) and compression (for VLU). In two cases use of EST* enabled cessation of illicit drug use which was being used as a mechanism for coping with wound-related pain.

Patient A: Tom is a 49 year old male, who presented to the community tissue viability team with a history of recurrent, chronic leg ulcers to his left lateral aspect, which had been present 17 years following multiple episodes of deep vein thrombosis. History included intravenous drug use and persistent, severe ulcer-related pain of 10 (VAS), which was unresponsive to standard pharmacological analgesia. In an attempt to manage his pain, the patient had turned to crack cocaine use. Wound progress was limited due to poor engagement with standard care, largely due to the uncontrolled pain. QoL score was 0/100.

Accel-Heal Solo* was applied with the aim of reducing the pain to enable cessation of crack cocaine, and facilitate tolerance to standard care. Two deep wounds were present:- upper wound 1 measured 25.5 cm^2; lower wound 2 measured 22.25 cm^2. Both had dark slough/ unhealthy tissue and peri-wound maceration, with local infection/biofilm (Fig 1a).

Fig 1a. Day 0

Within the 12-day treatment period, pain reduced to 2 (VAS) enabling cessation of crack cocaine and tolerance to topical antimicrobials and debridement. At 12 weeks, wound 1 measured 9.2 cm^2 (64% reduction, Fig 1b) and wound 2 measured 6.3 cm^2 (72% reduction), with decreased exudate, allowing transition to hosiery and greater self-care. He reported that his QoL improved to 66/100 (>60%), helping him to feel empowered and in control of his health. He also resumed running which further boosted his overall health.

Following the Accel-Heal Solo treatment, Tom has enrolled onto a Maths and Physics degree-level course with the Open University achieving high grades with aspirations of further study. 5 months after Accel-Heal Solo, the wound is almost healed.

Fig 1b. Week 12

Patient B: Dorothy was a 79 year old female with a category 4 pressure ulcer (PU) to the coccyx present for 18 months, with bone exposure, osteomyelitis, undermining and tunnelling. Despite opioids, her severe pain of 10 (VAS) prevented side-to-side repositioning.

At the beginning of treatment, the wound measured 28.25 cm^2 with a maximum depth of 7cm and undermining/tunnelling (Figure 2a).

Within the 12-day EST* therapy wound pain reduced to 2 (VAS) enabling her to tolerate gold-standard off-loading strategies.

Within 12 weeks the wound depth reduced by 86%, undermining and tunnelling were reduced and granulation tissue formed over the exposed bone (Figure 2b). Dressing change frequency reduced from daily to three-times weekly.

Fig 2a. Day 0

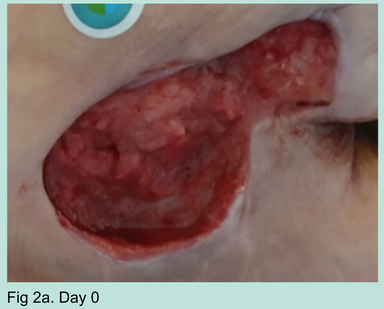

Fig 2a. Day 0

Patient C: Colin was a 49 year old male with bilateral VLUs present for 17 years, complicated by repeated wound infection. Wound pain was 10 and 7 (VAS) (left and right leg, respectively), despite taking pregabalin and illegally supplied marijuana for pain relief. A left leg below-knee amputation was scheduled due to poor healing and osteomyelitis to his femur. His QoL score1 was 0/100.

Prior to EST*, the wound to the left leg measured 246 cm^2 (Figure 3a) extending to below knee with thick slough and unhealthy rolled edges; right leg wound measured 120 cm^2 extending to below the knee with thick slough (Figure 3b). Both had high malodourous exudate, requiring three times weekly dressings.

Fig 3a Day 0

Fig 3b Day 0

Fig 3c Week 12

Fig 3d Week 12

12-weeks after bilateral EST* treatments, pain was reduced to 2 (<80%) and 0 (<100%) respectively. Marijuana use ceased and pregabalin use was halved. The left leg wound measured 197 cm^2 (20% reduction), with 100% granulation (Fig 3c). The right leg wound measured 70 cm^2 (42% reduction), with 100% granulation (Fig 3d). Both wounds had notably less depth, with healthy wound edges and granulation tissue present. Osteomyelitis was successfully managed and amputation was thus prevented. The patient was able to transition from compression bandaging to hosiery, enabling some self-care, and nursing visits reduced from three times weekly to weekly

His QoL score[1] improved to 82/100 (>82%). Colin described feeling “in control” for the first time in years, motivating positive lifestyle changes.

Accel Heal
ELECTRICAL STIMULATION WOUND THERAPY

Abbreviations: PU, pressure ulcer; QoL, quality of life; VAS, visual analogue scale; VLU, venous leg ulcer. | **Disclosures:** Accel-Heal Solo devices used in this study were provided by Accel-Heal Technologies Limited. Writing services were paid for by Accel-Heal Technologies Limited but were carried out independently.

References: 1. Green J (2017) Quality of Life Wound Checklist: Royal College of Nursing and Keele University. www.rcn.org.uk. Accessed 18th October 2025.

*Accel-Heal Solo, Accel-Heal Technologies Limited, Hever, Kent, UK. Presented at Wounds UK, Harrogate, 2025