USING SUBSENSORY ELECTRICAL STIMULATION THERAPY* TO REDUCE WOUND PAIN AND ENABLE REHABILITATION IN ORDER TO FACILITATE FASTER PATIENT DISCHARGE FROM HOSPITAL

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Background

- Patients with non-healing wounds experience reduced quality of life:
  - Physical, social and mental aspects including pain, hopelessness, anxiety, depression and reduced mobility[1-3]
- Pain is often the most significant problem[4]
- Patients often experience difficulties in taking analgesia
  - Some analgesia, particularly opioids have a detrimental effect on wound healing[5] so non-pharmacological approaches should be considered

Aim

- To explore the benefits of a 12-day automated electrical stimulation therapy (EST)* in reducing pain and stimulating healing for two patients in an acute hospital whose wound pain was preventing rehabilitation/hospital discharge

Methods

- Following consent, EST* was applied continuously to the wound edges alongside standard care
- Pain scores/analgesic consumption and wound dimensions were recorded prior to and during EST*

- The chosen EST device* is an easily operated, wearable therapy, delivering a pre-set programme of sub-sensory microcurrent over a continuous 12-day treatment period at the touch of a button

*Accel-Heal Solo, Accel-Heal Technologies Limited, Hever, Kent, UK.

1. Olsson M. et al (2019). *Wound Repair Regen* 27(1): 114–25; **2.** Olsson M and Friman A. *Br J Comm. Nurs.* 2020; 25(Sup12):S13-S19. **3.** Zhu X. et al. *Int Wound J.* 2022 Aug;19(5):1121-1132; **4.** Renner R. et al. *Acta Derm Venereol.* 2014; 94 (1);50-53. **5.** Milne J, et al. *J Wound Care*. 2021 Jul 2;30(7):568-580.

Results: Case Study 1

- Female, age 86 years
- Previous colorectal cancer
- Fracture to right femur repaired with IM nail

Patient with painful post-operative, traumatic wound was unable to be discharged from hospital as pain prevented weight-bearing thus preventing rehabilitation. After 6-days of treatment with EST* in combination with NPWT, pain and analgesic use had reduced to 0 and wound size had reduced considerably. Patient was able to be discharged home to continue her recovery

- Wound became infected (*Pseudomonas aeruginosa*)
- Wash out revealing large haematoma
- Larval therapy was administered
- Following larval therapy, medically fit for discharge, but **pain prevented weight-bearing, rehabilitation and hospital discharge**
- EST* was applied along with NPWT to manage exudate
- After 6 days of treatment with EST* + NPWT, patient was able to be discharged home, and the wound healed in the community

Within 6-days of treatment:

Wound dimensions reduced by 46%:
- From 10x4x5cm
- To 9x3x4cm

Wound pain resolved completely:
- From 10/10
- To 0/10

Need for analgesics reduced:
- From 30mg codeine; 2.5mg morphine; 1000mg paracetamol
- To no pain medication

"I am satisfied with the results. I am independently mobile with a zimmer frame, don't need hoist or other equipment's anymore. And most importantly, I am pain free".

Patient, post-operative wound

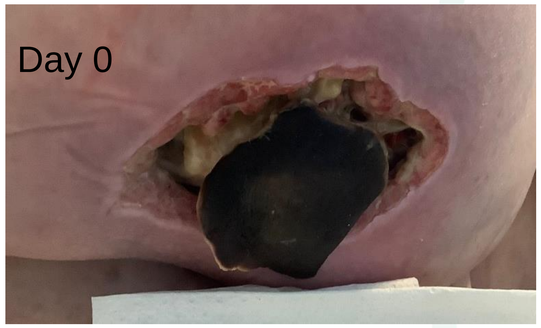
*Accel-Heal Solo, Accel-Heal Technologies Limited, Hever, Kent, UK.
EST, electrical stimulation therapy; IM, intramedullary; NPWT, negative pressure wound therapy; VAS, visual analogue scale.

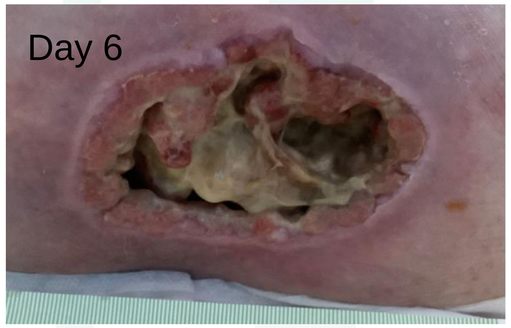
Results: Case Study 2

- Female, age 71 years
- Interstitial lung disease; factor V Leiden deficiency; history of multiple pulmonary embolisms (last one in 2017; on lifelong warfarin); high BMI; sarcoidosis; CKD; anaemia of CKD

- Unstageable, infected pressure injury to right ischial tuberosity
- MRI revealed osteomyelitis and IV antibiotics commenced
- Extensive eschar - surgical debridement not advisable due to health complications
- Bed bound due to pain, which was 10/10 (VAS)

- EST* applied along with autolytic debridement





- Medically fit for discharge with intravenous antibiotics but remained in hospital due to social circumstances and awaiting a social care package.
- Hospital discharge 53 days after initiating treatment

Within 6-days of treatment:

Wound area reduced:
- From 10.5x6cm (with unknown depth)
- To 8x4.5cm
- Eschar was completely debrided and depth could now be assessed (6cm)

- Wound pain (VAS) reduced by 30% (from10/10 to 7/10)
- Improved sleep
- Enabled rehabilitation and improved mobility

Need for analgesics reduced:
- Taking 2.5mg morphine and 1000mg paracetamol at day 0
- Reduced need for opioids as early as day 2, which improved her energy levels

- Patient continued to improve post-discharge.
- She was extremely pleased with the outcome, due to pain reduction and improved sleep pattern

BMI, body mass index; CKD, chronic kidney disease; EST, electrical stimulation therapy; IV, intravenous; VAS, visual analogue scale.
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Conclusions

EST* may help to manage wound pain sufficiently to enable rehabilitation, reduce the need for analgesics and facilitate hospital discharge, having a significant impact on reducing hospital stays and improving the quality of life for patients.

The Tissue Viability Team are currently developing a clinical pathway to use EST* for patients in their hospital trust.

References

1.Olsson M, Järbrink K, Divakar U et al. The humanistic and economic burden of chronic wounds: A systematic review. *Wound Repair Regen.* 2019; 27(1): 114–25.

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