CASE STUDIES

Using innovative Accel-Heal electrical stimulation therapy in the treatment of hard-to-heal and painful wounds

accelheal.com

Accel Heal
ELECTRICAL STIMULATION WOUND THERAPY

HARD-TO-HEAL WOUNDS CONTINUE TO BE A MAJOR BURDEN

Despite therapy advances in wound management over the last 30 years, hard-to-heal wounds are an increasing problem.

The total cost of wounds in the UK has been estimated to be £8.3bn, with two-thirds of the cost (£5.6bn) accounting for unhealed wounds each year.[1] 51per cent of chronic wounds fail to heal within 12 months.[1] With prevalence and costs increasing, some expert panels have suggested that globally "wound care is in crisis." [2]

Only 6 per cent of the annual spend is attributed to wound care products, with most of the costs being spent on healthcare professionals in the community. [1]

The majority of patients require dressing changes at least twice a week and more than a third require daily dressing changes, putting pressure on health care practitioner caseloads. [3]

Hard-to-heal wounds are often extremely painful - between 50 and 60 per cent of patients with chronic wounds experience persistent wound pain. [4, 5]

Pain influences many aspects of wound therapy. One major issue is that pain can make some gold standard therapies such as compression therapy and debridement intolerable; this can lead to reduced concordance and worse outcomes. Wound pain can also severely impact patients' quality of life [4, 5].

WHAT IS ELECTRICAL STIMULATION THERAPY (EST)

Microcurrent electrical stimulation is subsensory and works at the cellular level to help wounds heal. It is a proven therapy method for wound management which has been used by specialists and researchers for many years.

It is one of the most evidence-based wound management technologies available, reported in at least 35 randomised controlled trials.[6, 7] Its use has been recommended by the European Pressure Ulcer Advisory Panel to treat recalcitrant category 2 to 4 pressure ulcers. [8]

The European Wound Management Association (EWMA) has also acknowledged that electrical stimulation is effective in treating a wide range of wound types including venous leg ulcers, diabetic foot ulcers, pressure ulcers and mixed ulcers. [9]

Electrical stimulation is proven to improve healing [6,9] whilst reducing pain [10, 11] and inflammation [12]. As microcurrent electrical stimulation is subsensory and cannot typically be felt by the patient, it is safe to use. [9]

Until now, electrical stimulation has not been widely adopted into everyday practice. Many established, hospital-based devices are complicated for healthcare practitioners to use. Patients are inconvenienced by the need to visit the hospital for therapy and would rather be treated at home. [9]

HOW ACCEL-HEAL ADDRESSES THESE PROBLEMS

Used to treat hard-to-heal wounds, Accel-Heal is an innovative electrical stimulation therapy which relieves pain and stimulates healing.

Accel-Heal has been designed to provide advanced therapy in a simple format that can be used to complement standard wound care.

Accel-Heal Solo is the next generation of Accel-Heal and offers all the benefits of the original device (which needed changing every 48 hours) while providing the therapy using one device which runs for the duration of the 12-day treatment.

It is a single-use, small, wearable device that can be discreetly tucked away and can easily be managed by patients in their own homes.

There is no complicated set-up and therapy is started with the simple push of a button.

HOW ACCEL-HEAL IMPROVES OUTCOMES

RELIEVES WOUND PAIN
[7] [13]

STIMULATES HEALING
[13–15]

IMPROVES PATIENT QUALITY OF LIFE
[14–16]

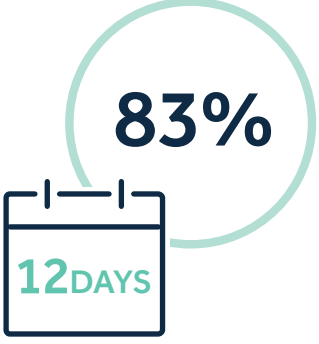
SAFE
[7]

COST- EFFECTIVE
[7]

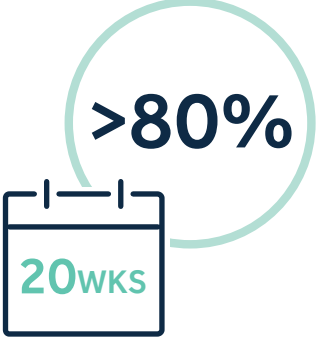
THE EVIDENCE

During Accel-Heal therapy patients can expect to find that pain is relieved and the normal healing process is stimulated.

The benefits continue long after the therapy period has been completed, putting them on the road to recovery.



83 per cent reduction in pain during 12-day therapy [13]



Over 80 per cent of non-healing wounds healed in 20 weeks of therapy [13–15]

HOW ACCEL-HEAL BENEFITS PATIENTS

Better quality of life Pain reduction

- Patients have reported marked pain relief following therapy with Accel-Heal [7,13] with some patients reporting rapid improvement within hours of commencing therapy. [17]
- This has enabled patients to reduce, or come off pain relieving medication completely [18, 19] and even return to work.[19]
- Patients were also able to return to normal social activities thanks to experiencing less pain and increased mobility.[14, 18]

Wound healing

- Non-healing wounds are "kick-started" into healing again [7,23,24,25], using Accel-Heal. This is noted during and following the Accel-Heal therapy.

  Patients reported improved quality of life due to exudate reduction, reduced irritation and wound healing [14].

Improved tolerance to gold standard treatments

- Patients treated with Accel-Heal were able to tolerate compression therapy as a direct result of its pain relieving benefits. [19, 20]
- Accel-Heal can also be used to manage patient pain in order to allow investigations such as blood flow testing or other therapies such as debridement to be carried out, which the patient might not otherwise be able to tolerate. [17]

"I WAS IN QUITE A BAD WAY, AND NOW I'M LOOKING FORWARD TO ENJOYING MY LIFE AGAIN"

ACCEL-HEAL IS COST-SAVING

Accel-Heal breaks the cycle of the ever-increasing prevalence of wounds being managed by clinicians. This is achieved by accelerating healing and therefore reducing the cost of dressings and nursing time.

£936

REDUCING THE PER-PATIENT COST OF MANAGING A VLU BY UP TO £936 [26]

1/3

REDUCING THE COSTS OF DRESSING CHANGES BY UP TO A THIRD [22]

34%

REDUCING THE NUMBER OF NURSING VISITS NEEDED PER PATIENT PER YEAR BY 17 - A 34% REDUCTION [26]

11%

WITH REDUCING THE COST TO THE NHS OF VENOUS LEG ULCERS BY 11% [23]

HOW ACCEL-HEAL WORKS

NORMAL WOUND HEALING RELIES ON A "CURRENT OF INJURY"[1]

Within the skin there is a stored electrical potential known as the"skin battery" or "skin current" (figure 1). [27]

After wounding, microcurrents flow into the wound site, establishing a 'current of injury', which helps to direct cell migration and proliferation from the wound edge into the centre of the wound. (figure 2). [27]

IN HARD-TO-HEAL WOUNDS, the current of injury may become exhausted [27] or dysfunctional. Evidence demonstrates that the normal current strength declines by 48 per cent in over 65 year olds. [29, 30]

Applying electrical stimulation is believed to replicate natural stimulation, which promotes healing .[10] Accel-Heal relieves pain and stimulates healing by directly affecting cell behaviour in and around the wound bed (figure 3). [28]

These cellular changes suggest that Accel-Heal may dampen down the inflammatory environment that is present in complex wounds. Case studies have reported a visually apparent reduction in wound inflammation in as little as 7 days after applying the Accel-Heal device.[14]

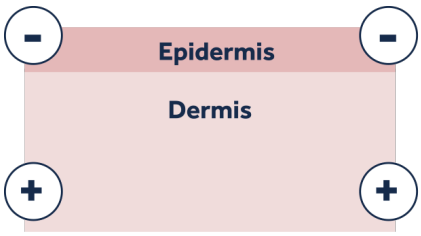


Figure 1 Skin battery

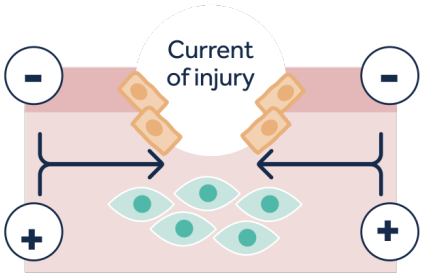


Figure 2 Current of injury

WHEN EXTERNALLY APPLIED TO HARD-TO-HEAL WOUNDS, EST STIMULATES MANY ASPECTS OF THE HEALING PATHWAY, WHICH HAVE BECOME IMPAIRED[2]

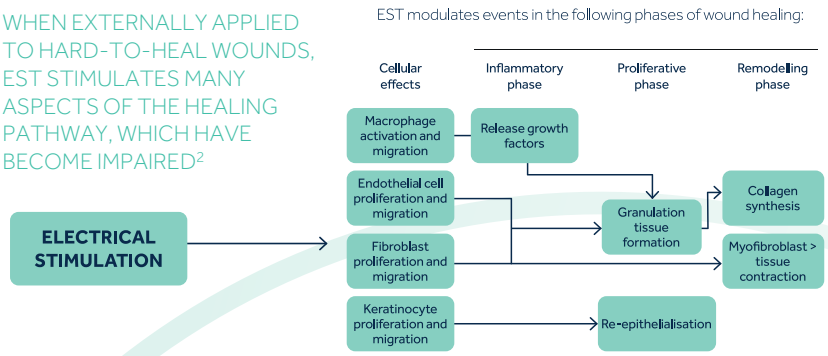
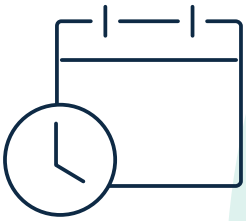


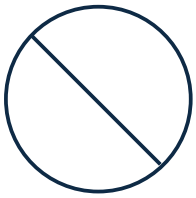
Figure 3 Cellular effects of wound healing using Accel-Heal

WHICH PATIENTS CAN BENEFIT FROM ACCEL-HEAL?



Patients with a hard-to-heal wound that is not progressing to healing

Patients who are frustrated by the reduced mobility caused by their pain



Patients whose wound pain causes them to be intolerant to gold standard therapy, such as compression and debridement.

Accel Heal Solo

ELECTRICAL STIMULATION WOUND THERAPY

RELIEVE PAIN **STIMULATE HEALING**

There have been significant advances in chronic wound management treatments over the last 30 years, however, hard-to-heal wounds are an increasing problem.

Chronic wounds can also be extremely painful – between 50 and 60 per cent of patients with a chronic wound experience persistent pain.[1,2] One major issue is that pain can make gold standard treatments, such as compression, unbearable.[3]

Electrical stimulation has been used globally in specialist clinics for more than a decade to relieve pain and accelerate healing in chronic wounds. With nine meta analyses and over 35 randomised controlled trials published, electrical stimulation is one of the most evidence-based technologies in wound management.

Electrical stimulation therapy is now available in a simple to use, single-use, wearable device, enabling its more widespread use across different care settings. Accel-Heal Solo electrical stimulation wound therapy is a one-off, interventional, 12-day treatment which is applied alongside existing care to relieve pain [4] and accelerate healing [4,5]. Accel-Heal Solo improves the quality of life for the patient [5] and helps facilitate the use of compression therapy where wound pain has been an issue.[6]

To find out more about Accel-Heal Solo, please contact customerservices@accelheal.com

References. 1. Price P, et al. Managing painful chronic wounds: the Wound Pain Management Model. Int Wound J. 2007;4(1). 2. Hellström A, et al. Leg ulcers in older people: a national study addressing variation in diagnosis, pain and sleep disturbance. BMC Geriatr. 2016;16(1):25. 3. Atkin L, et al. Accel-Heal Made Easy. Wounds UK. 2019. https://www.wounds-uk.com/resources/details/made-easy-accel-heal-electrical-stimulation 4. Guest J, et al. Cost-effectiveness of an electroceutical device in treating non-healing venous leg ulcers: results of an RCT. J Wound Care. 2018;27(4):230-243. 5. Turner N, Ovens L. Clinical outcome results and quality of life improvements using electroceutical treatment* - Patient perspectives. Presented at: EWMA 2018. 6. Ovens L. Presented at: Wounds UK. ; 2014.

CASE STUDIES COMPENDIUM

PAGE CONTENTS

CASE STUDY ONE

REDUCING PAIN, ENABLING COMPRESSION THERAPY

SUMMARY

A patient with a venous leg ulcer was unable to tolerate any compression therapy due to a very high pain score of 10/10.

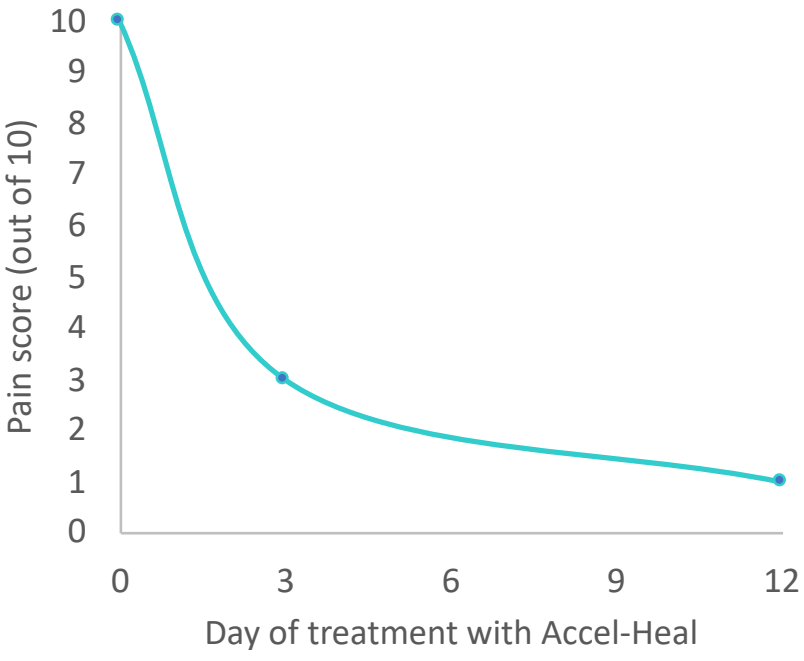
Therapy with Accel-Heal rapidly relieved the pain, allowing graduated compression therapy to be started. The wound healed three weeks after starting Accel-Heal therapy.

BEFORE ACCEL-HEAL

A 50-year-old patient with a history of recurring venous leg ulcers despite wearing compression hosiery, presented with a very painful ulcer of three-weeks duration. The patient had previously suffered from fracture of the right ankle. Limb assessment confirmed advanced venous disease. The patient's wound was excruciatingly painful with a pain score of 10/10 despite taking co-codamol and pregabalin.

The wound pain caused her to cry with the discomfort, particularly during dressing changes. Various topical cleansers, honey and absorbent dressings with support bandages had been applied. She had also had several courses of antibiotics.

Although graduated compression therapy was considered, the patient could not tolerate the therapy because of the wound pain. She also could not tolerate the assessment of ankle-brachial pressure index (ABPI), although all foot pulses were audible with tri-phasic and bi-phasic sounds.



Graph showing pain score reduction during and following Accel-Heal

DURING THERAPY

Accel-Heal was commenced with the aim to relieve the pain sufficiently to measure ABPI and to enable the patient to wear graduated high compression bandaging. At the beginning of therapy, the wound measured approximately 7.5cm square.

Alongside Accel-Heal, the wound was dressed with a topical honey dressing and highly absorbent secondary dressing and a support bandage. The peri-wound skin was protected with barrier cream. During dressing changes the wound was irrigated with anti-microbial irrigation fluid.

Three days after starting Accel-Heal therapy, the patient returned to clinic for a scheduled dressing change. Her pain score was much reduced to 3/10. She reported sleeping better and was now able to tolerate dressing changes.

The pain continued to improve during therapy. The wound itself also significantly improved with a reduction in wound size and exudate. At the end of the 12-day therapy the pain was minimal and only small dry scabs remained.

AFTER ACCEL-HEAL

At the end of the 12-day Accel-Heal therapy, graduated short stretch compression bandaging was applied. The aim was to continue short stretch bandaging until good tensile strength was obtained in the wound and then to measure for compression hosiery to prevent recurrence. The wound was completely healed, and the patient was discharged with compression hosiery, around two months after Accel-Heal therapy.

The patient was so grateful for the 'wonderful result' and in particular she expressed the delight in achieving a 'normal and pain free Christmas', which she had been very worried about. She was surprised by the speed of recovery and more importantly the reduction in pain being so significant within a few days of therapy.

Figure 1. Day 0 Wound to right medial malleolus

Figure 2. Day 0 Wound to right medial malleolus

Figure 3. Day 0 Commencing Accel-Heal

Figure 4. Day 56. Right medial malleolus. Wound healed

CASE STUDY TWO

REDUCING PAIN, ENABLING COMPRESSION THERAPY

SUMMARY

90-year-old patient sustained a traumatic wound resulting in a non-healing venous leg ulcer which had been present for four to six months. The wound healed 12 weeks following Accel-Heal therapy.

BEFORE ACCEL-HEAL

The patient had a diagnosis of dementia. Limb assessment demonstrated venous incompetence, with ankle brachial pressure index within normal limits. Compression therapy was therefore indicated but had been poorly tolerated due to her pain levels.

The wound measured approximately 24.75 cm square. She was prescribed twice weekly dressings with honey and graduated high compression bandages. Her pain score was 5/10.

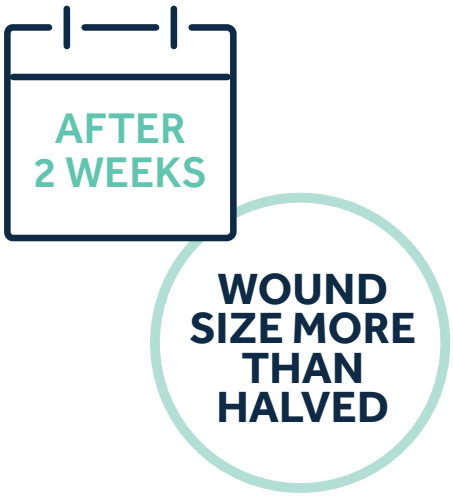
DURING THERAPY

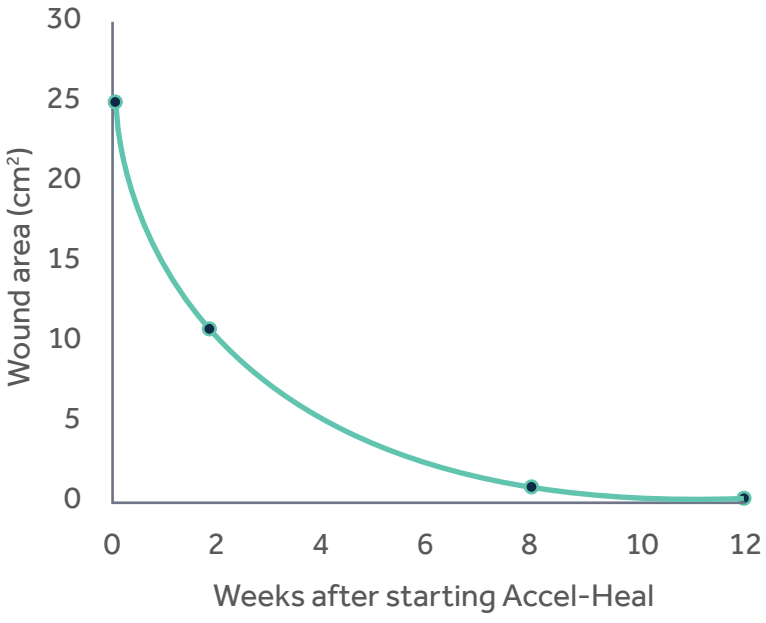
Therapy with Accel-Heal commenced and continued for 12 days, along-side standard care with graduated high compression therapy and primary dressings as per local protocol.

AFTER ACCEL- HEAL

Two weeks after commencing therapy with Accel-Heal, the wound had halved in size to approximately 10.25 cm square. Exudate significantly reduced and dressing changes were reduced to weekly.

The wound pain score had reduced to 1/10. At week eight, the wound measured approximately 0.5 cm square with no pain and the wound had completely healed within 12 weeks.





Graph showing pain score reduction during and following Accel-Heal

Figure 1. Day 0 Wound to left tibial crest prior to Accel-Heal

Figure 2. Day 36. Wound to left tibial crest

Figure 3. Wound to left tibial crest healed at week 12

CASE STUDY THREE

KICK-STARTING HEALING IN A PREVIOUSLY STALLED WOUND

SUMMARY

A patient with recurrent arterial foot ulcers was experiencing high levels of wound pain. Therapy with Accel-Heal reduced wound pain from 8/10, to 0/10, within the first 5 days of therapy.

The wound, which had been present for six months, healed nine weeks after starting Accel-Heal therapy.

BEFORE ACCEL-HEAL

A 75-year-old patient presented with recurrent arterial foot ulcers on her right foot that had been present for four months. She had previously experienced foot ulcers and suffered an MRSA infection. The patient was a smoker with poor ankle movement, claw toes and poor mobility who had been self-caring for her wounds with support from her brother and husband who were podiatrists.

She presented with two wounds, measuring approximately 6cm square. The wounds were painful with a score of 8/10. A gel sheet was applied to re-hydrate the wounds. Although this initially reduced the pain to 4/10 within a few weeks there were no further improvements and the pain score had increased back up to 8/10.

DURING THERAPY

Accel-Heal was commenced along-side the gel-sheet dressings which were changed twice weekly throughout the 12-day therapy.

Within five days of commencing Accel-Heal therapy, the patient's pain score had reduced to 0/10. The wound bed was much improved, with reductions in both size and depth.

AFTER ACCEL-HEAL

After the 12-day therapy period the wound continued to be managed with gel sheet dressings, twice weekly.

The wound continued to progress and complete healing was achieved within 8 weeks of commencing Accel-Heal. The following month, the patient underwent an angioplasty to help prevent recurrence.

Figure 1. Prior to Accel-Heal on right dorsum

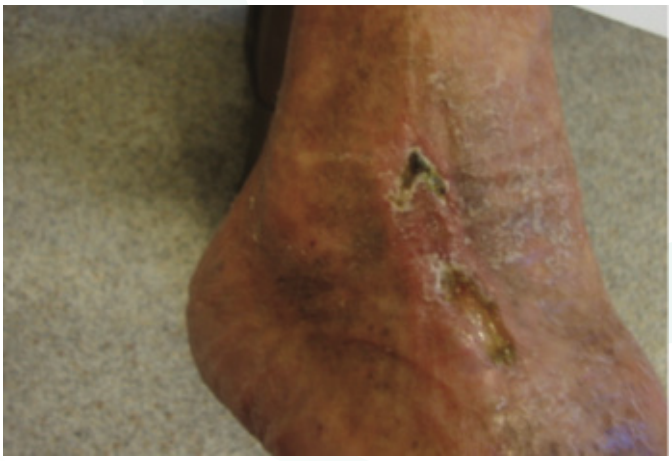


Figure 2. Day 5. Right dorsum of foot

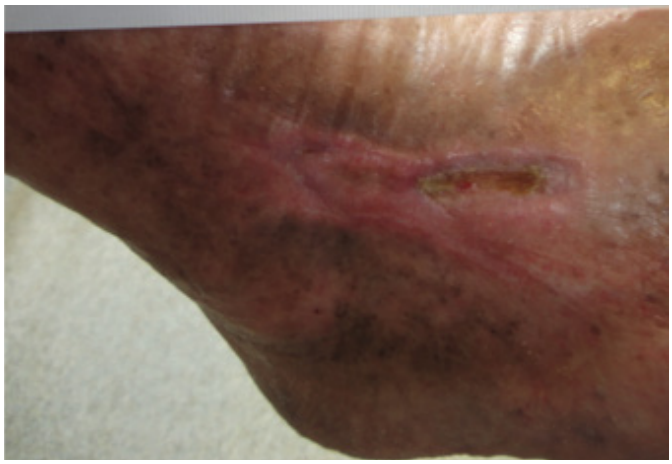


Figure 3. Day 12. Right dorsum of foot,following completion of Accel-Heal

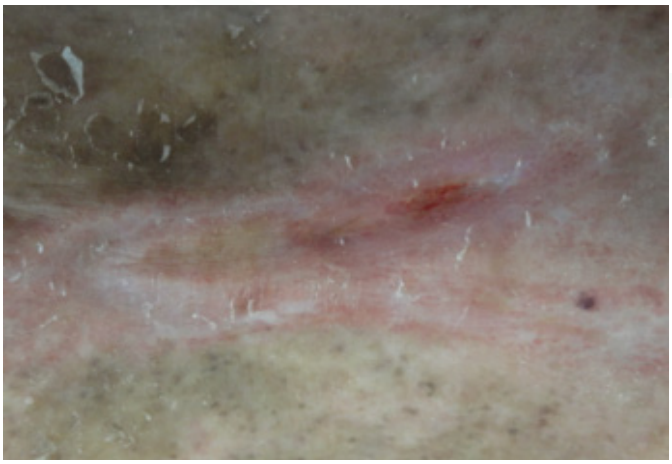


Figure 4. Week 8. Right dorsum of foot wound healed

CASE STUDY FOUR

KICK-STARTING HEALING IN A PREVIOUSLY STALLED WOUND

SUMMARY

A patient with bilateral recurrent venous leg ulcers, which had been present for more than four months, was treated with Accel-Heal. Both wounds significantly improved within three months following Accel-Heal therapy.

BEFORE ACCEL-HEAL

A 75-year-old patient presented with bilateral recurrent venous leg ulcers, despite wearing compression hosiery. The wounds remained unhealed at four months. The wound on the left leg wound measured 7cm square and the wound on the right leg wound measured 10cm square.

Despite wearing graduated high compression bandaging for four weeks, there was no improvement noted. He was referred to the vascular team for possible vascular surgery, in view of his recurrence. His pain score was 6/10 despite taking regular co-codamol and he was referred to the GP for analgesic review.

DURING THERAPY

Following discussion and consent, the patient was prescribed Accel-Heal therapy with the aim of reducing wound pain and kick-starting wound healing. In view of the size, depth and condition of the wound, it was decided to apply the electrode pads to the left medial wound.

The 12-day Accel-Heal therapy commenced. Standard moist wound healing and graduated high-compression therapy continued during and following Accel-Heal therapy. Twice weekly dressing changes continued. The patient changed his own Accel-Heal devices every 48-hours, in line with the instructions provided.

AFTER THERAPY

Two weeks after starting Accel-Heal therapy, there was no change to the patient's pain score, but the patient reported that much of his pain was now due to arthritis of the ankles, rather than wound-related pain. He was taking regular analgesia, following review by the GP.

By week 4, the wound area on the patient's left leg had significantly reduced, now measuring only 1cm square. The pain score had also reduced to 2/10. Dressing changes could now be reduced to once weekly; the wounds continued to improve. Unfortunately, the patient was lost to follow-up, so the time to complete healing could not be determined.

Figure 1. Left medial aspect prior to Accel-Heal

Figure 2. Right medial aspect prior to Accel-Heal

Figure 3. Week 4. Left medial wound

Figure 4. Week 9. Left medial wound

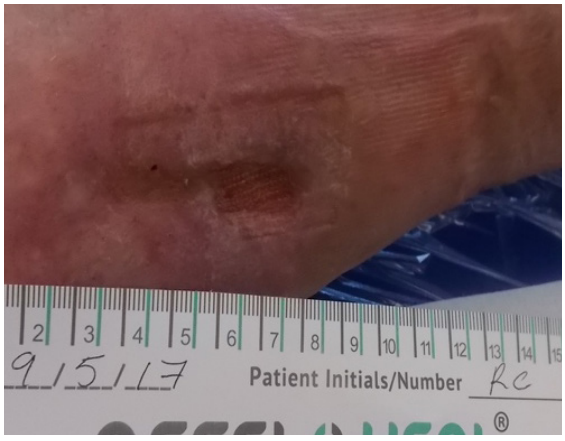


Figure 5. Week 9. Right medial wound

Figure 6. Week 9. Right medial wound

CASE STUDY FIVE

IMPROVING PATIENT QUALITY OF LIFE

SUMMARY

A 56-year-old patient developed non-healing wounds following chickenpox. The patient became very frustrated and depressed about the lack of progress of his wounds, which had been present for 15 months. Wounds were very painful despite analgesia and antimicrobial dressing being used.

Accel-Heal relieved pain and kick-started healing. The wound was healed within five months after starting Accel-Heal therapy, improving the patient's mental health.

BEFORE ACCEL-HEAL

The patient, who was the main carer for his mother, developed chickenpox, resulting in wound development to his right leg. He had a past medical history of fracture of the right tibia and fibula with insertion of a plate; previous radiology had excluded osteomyletitis. Venous duplex revealed evidence of some venous incompetence but no deep vein thrombosis.

Despite being suitable for venous surgery, this was declined. The patient reported wound pain of 6/10 for which he was prescribed co-codamol. He was unable to tolerate any compression or support bandage.

Therapy commenced with topical anti-microbial cleansing solutions and dressings twice weekly. The patient would regularly attend the clinic but was often withdrawn, sometimes verbally aggressive and frustrated with the lack of progress with his wounds. He declined support for his mother, anti-depressants and referral to the pain clinic and initially declined Accel-Heal therapy for some time. The wound became regularly infected and the pain score increased to 8/10 despite antibiotics and analgesia.

DURING THERAPY

The patient agreed to try Accel-Heal therapy seven months after presentation to the clinic, in view of non-progression, pain level and persistent infection. The electrode pads were applied to the tibial crest wounds, alongside anti-microbial dressings which were changed twice weekly during therapy.

Within one week of commencing the Accel-Heal therapy, the pain score was halved to 4/10.

AFTER ACCEL-HEAL

Two months following therapy, there was significant improvement in the status of the wound. Pain was now reduced to 2/10.

The patient's mental health was noted to have improved considerably and four months after Accel-Heal, all the wounds were healed. The patient was absolutely delighted with the outcome on his previously non-progressing wounds.

Figure 1. Right tibial crest and maleolus on presentation to the clinic

Figure 2. Right maleolus on presentation to the clinic

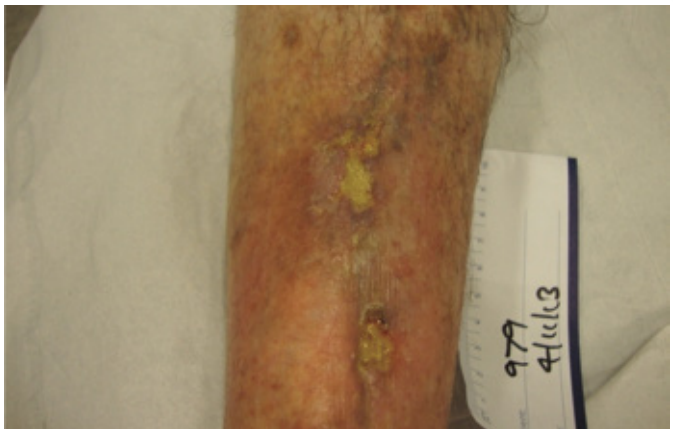


Figure 3. Day 0. Right tibial crest prior to commencing Accel-Heal

Figure 4. Right maleolus wound healed four months after commencing Accel-Heal

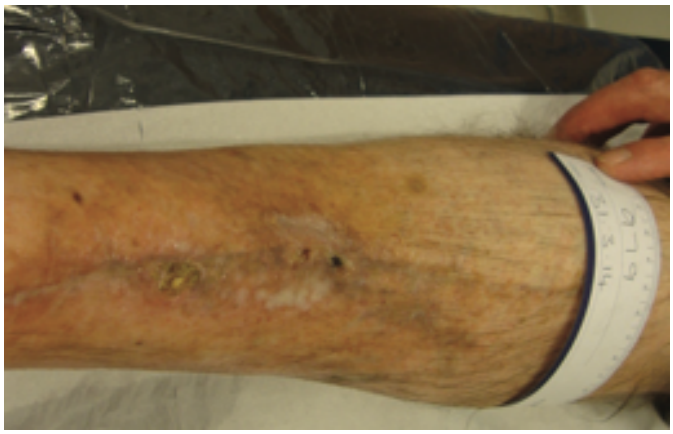


Figure 5. Right tibial crest – wounds healed after commencing Accel-Heal

CASE STUDY SIX

REDUCING PAIN AND KICK-STARTING HEALING

SUMMARY

A patient with diabetes and a deep post-operative Ray amputation wound was experiencing high levels of pain. Accel-Heal therapy reduced the pain from 7/10 to 5/10 within two days.

The deep wound reduced in size by 99 per cent within 10 weeks of commencing Accel-Heal therapy, with no pain.

BEFORE ACCEL-HEAL

A 38-year-old male with diabetes and a Ray amputation of the left big toe presented with a non-healing wound of two months duration, which had become infected. He was having daily dressings and taking antibiotics. Wound dimensions were 48 cubic cm with 100 per cent granulation and low serous exudate. His pain score was 7/10 (VAS).

DURING THERAPY

Treatment with Accel-Heal commenced alongside standard care, according to local protocol, and continued for the 12 day therapy.

Within two days of commencing Accel-Heal therapy, the pain score reduced to 5/10 (VAS).

AFTER THERAPY

Two weeks after commencing Accel-Heal therapy, the wound size reduced to 24 cubic cm (50 per cent reduction).

The wound was almost healed within 10 weeks, measuring 0.5 cubic cm (99 per cent reduction), with no pain present.

Figure 1. Day 0. Ray amputation wound prior to commencing Accel-Heal

Figure 2. Day 12. Ray amputation wound following Accel-Heal therapy

Figure 3. Ray amputation wound 10 weeks after commencing Accel-Heal therapy.

CASE STUDY SEVEN

REDUCING PAIN AND KICK-STARTING HEALING

SUMMARY

A patient with a history of non-progressing peri-anal post-surgical wound present for 5 months and a high pain score of 5/10 (VAS). Within four weeks of commencing Accel-Heal therapy, the pain reduced by 60 per cent and the wound decreased in depth, with considerably less exudate.

BEFORE ACCEL-HEAL

A 78-year-old female presented with a peri-anal wound following the removal of rectal cancer and radiotherapy 10 months previously. Five months later she developed seam dehiscence which became recalcitrant and was treated with topical negative wound therapy. Her pain score was 5/10 (VAS).

DURING THERAPY

Accel-Heal therapy was commenced to kick-start wound healing and reduce the pain.

AFTER THERAPY

Fourteen days after the start of Accel-Heal therapy, the wound had reduced in size. Four weeks after commencing Accel-Heal therapy, the pain score was reduced to 2/10 (VAS) (60 per cent reduction), the level of exudate was completely reduced and epitheliasation was noted to the wound edges. The peri-wound tissue was noted to be much softer.

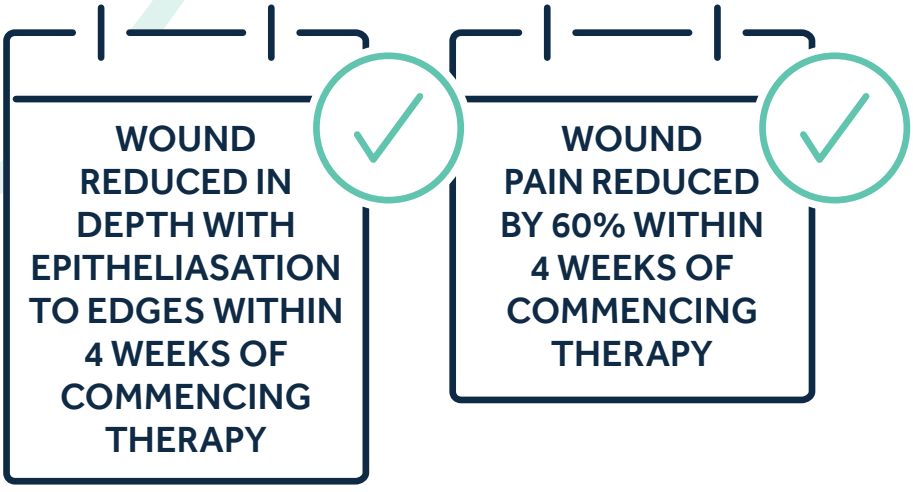


Figure 1. Day 0. Peri-anal wound prior to Accel-Heal therapy

Figure 2. Day 14. Peri-anal wound following completion of Accel-Heal therapy

Figure 3. Day 28. Peri-anal wound following completion of Accel-Heal therapy

CASE STUDY EIGHT

REDUCING PAIN AND KICK-STARTING HEALING

SUMMARY

A patient with a five-month history of extensive and extremely painful diabetic foot ulceration was treated with Accel-Heal. Following the 12-day Accel-Heal therapy, the pain score reduced by 29 per cent. Within 14 weeks, the wound size had significantly reduced by 68 per cent and the patient had no pain.

BEFORE ACCEL-HEAL

An 80-year-old female with diabetes and hypertension had suffered a right foot ulcer for five months. She had a medical history of diabetes mellitus and hypertension. She suffered from severe pain with a score of 8.5/10 (VAS) despite taking regular tramadol and paracetamol. The wound area was extensive, measuring 133 cm square with thick yellow slough and heavy, purulent exudate.

DURING THERAPY

Accel-Heal therapy was commenced alongside standard care, to reduce pain and expedite wound healing. She was being treated in hospital.

AFTER THERAPY

There was a 10 per cent reduction in wound size after the 12-day Accel-heal therapy. The pain score reduced to 6/10 (VAS), and she only required occasional paracetamol.

Within 14 weeks of commencing Accel-Heal therapy, the wound measured 42 cm square, demonstrating a 68 per cent reduction. The pain had completely subsided with Accel-Heal.

100%
REDUCTION IN PAIN

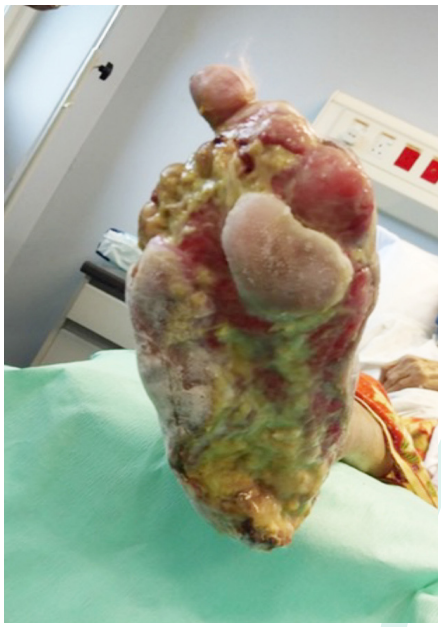


Figure 1. Day 0. Diabetic foot wound prior to Accel-Heal therapy

**Figure 2. Diabetic foot ulcer.
Day 14 - Completion of Accel-Heal therapy**

Figure 3. Diabetic foot ulcer, 14 weeks after commencing Accel-Heal therapy

CASE STUDY NINE

REDUCING PAIN AND KICK-STARTING HEALING

SUMMARY

A patient with a three-year history of a complex arterial ulcer, had undergone many surgical interventions. She had a very high pain score of 8/10 (VAS). Pain score reduced by 75 per cent within the 12-day Accel-Heal therapy. Her wound healed within six months.

BEFORE ACCEL-HEAL

An 84-year-old female presented with a three-year history of a painful arterial ulcer on her right lateral leg. She underwent initial surgical debridement with dermal substitute to the superficial peroneal nerve, split skin grafting and topical negative wound therapy, resulting in 50 per cent graft take (figure 1), but the wound failed to heal.

Between 2017 and 2021, the ulcer underwent several surgical debridement's and skin grafts along with 10 revascularisation procedures for recurrent re-stenosis despite Warfarin therapy. Infection and severe pain further complicated the ulcer status, despite the application of many topical anti-microbial dressings, intermittent courses of antibiotics and regular analgesia.

DURING THERAPY

Accel-Heal therapy started to reduce pain and kick-start healing. The wound measured 3.4 cm square with unhealthy granulation tissue, rolled edges and a pale wound bed with moderate exudate (figure 2) . Her pain score was 8/10 (VAS).

AFTER THERAPY

Following the 12-day therapy, the wound was visibly smaller, with less slough and depth. Her pain score reduced to 2/10 (VAS). Three weeks after commencing Accel-Heal therapy, the wound measured 1.65 cm square, with 60 per cent epithelial tissue and 40 per cent granulation (figure 3).

Unfortunately, a month later her pain score increased to 8/10 (VAS) due to infection and a further stent blockage (figure 4). Progressive wound healing with almost complete epithelialisation was achieved by 15 weeks, and the pain score reduced to 1/10 (VAS). The pain score remained consistently less than it had been in the five years prior to the Accel-Heal therapy.

She was once again hospitalised in June 2021 with vascular and cardiac issues. A further stent blockage occurred leading to critical ischaemia of the leg. Despite this, the wound continued to heal with moist wound healing dressings and anti-microbials. Complete closure was noted at six months from the start of Accel-Heal therapy and has remained healed to date with no pain (figure 5).

The relief of healing the wound after so many years has been wonderful for her, as she lives alone and was struggling to cope with managing the wound, pain medication and dressing regime. The clinical team in Australia were delighted to see this long-term wound remaining healed, and now considers Accel-Heal to be a treatment option for other challenging wounds that are not responding to routine treatment.

PAIN SCORE REDUCED BY 75%
WITHIN 12 DAY THERAPY

WOUND PRESENT FOR 3 YEARS,
HEALED WITHIN 6 MONTHS

Figure 1. Arterial leg ulcer following skin graft with partial up-take in 2017

Figure 2. Arterial ulcer. Day 0. Accel-Heal therapy commenced

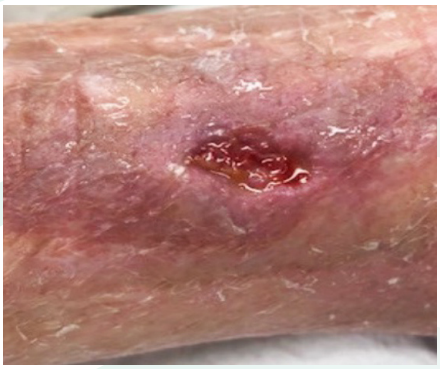


Figure 3. Arterial leg ulcer. Day 12. Completion of Accel-Heal therapy

Figure 4. Arterial leg ulcer. 9 weeks post Accel-Heal, wound deterioration following infection and stent blockage

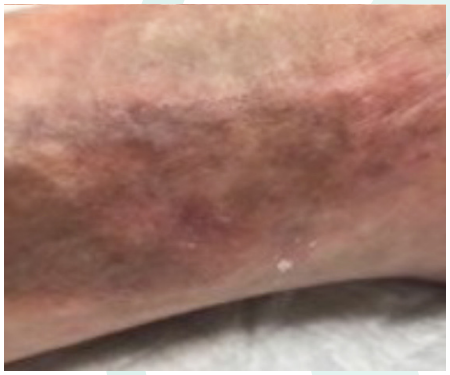


Figure 5. Arterial leg ulcer. Wound healed 6 months from start of Accel-Heal therapy

CASE STUDY TEN

HEALING A COMPLEX POST-OPERATIVE WOUND

SUMMARY

A stalled post-operative Hallus Valgus wound with exposed bone, present for five months, despite application of growth factor therapies. Within nine days of commencing Accel-Heal therapy, healing occurred over the bone. Within two months, the bone was completely covered with granulation tissue and the wound was reduced by 98 per cent.

BEFORE ACCEL-HEAL

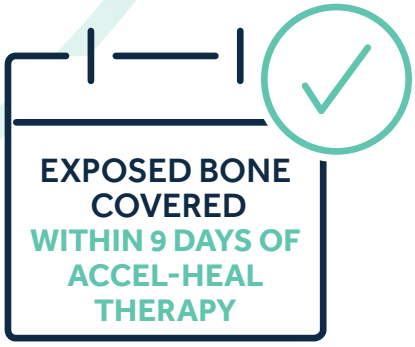
A 65-year-old gentleman with type 2 diabetes had Hallus Vagus surgery in June 2020. The wound initially healed as expected and then became stalled. He presented to the wound clinic five months later, when bone exposure was noted during the assessment. Several growth factor therapies were applied with no effect.

DURING THERAPY

Treatment with Accel-Heal therapy was commenced. Within nine days healing had occurred over the bone exposure, with significant improvement in size and depth.

AFTER THERAPY

A second Accel-Heal therapy was applied, in view of the wound complexity. Two months after commencing Accel-Heal therapy the exposed bone was completely covered with granulation tissue and the wound size was 98 per cent smaller. Clinicians and the patient were all delighted with the results, which they described as "*a sensational result*".



Figures 1 and 2. Day 0. Post-surgical wound with exposed bone prior to Accel-Heal therapy

Figure 2.

Figure 3 and 4. Day 9. Post-surgical wound during Accel-Heal therapy

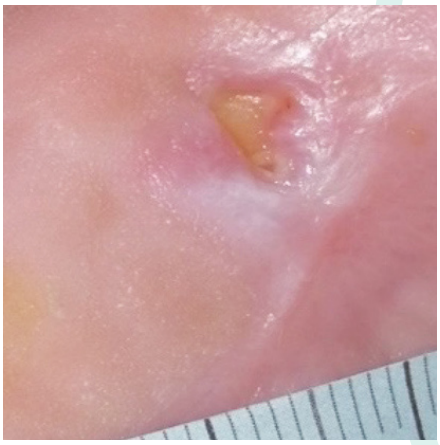


Figure 4.

Figure 5. Post-surgical wound 2 months following 2 x Accel-Heal treatments

CASE STUDY ELEVEN

HEALING OF DIABETIC FOOT ULCER OF 15 YEARS DURATION, WITHIN 11 WEEKS

SUMMARY

Complex diabetic foot ulcer to right plantar of 15 years duration. Treated with Accel-Heal therapy. Wound healed within 11 weeks.

BEFORE ACCEL-HEAL

A 67-year-old male presented with poorly controlled diabetes and hypertension and was on dialysis for end-stage kidney disease. He had a diabetic foot ulcer to the right plantar of 15 years duration. He had frequent debridement procedures, but had always been reluctant regarding the use of any off-loading shoes or devices.

DURING THERAPY

Accel-Heal therapy was commenced. Alternate day dressings continued according to local protocol. The patient was supported to improve his blood sugars and to use off-loading shoes/devices.

AFTER THERAPY

At the end of the 12-day Accel-Heal therapy, an improvement was noted in the wound bed. Further follow-up was hampered by the Covid 19 pandemic. Eleven weeks after starting Accel-Heal therapy, the wound was fully healed.

Figure 1. Day 0. Diabetic foot ulcer to right plantar prior to Accel-Heal therapy

Figure 2. Day 12 . Diabetic foot ulcer to right plantar on completion of Accel-Heal therapy

Figure 3. Diabetic foot ulcer to right plantar, 11 weeks following Accel-Heal therapy

CASE STUDY TWELVE

REDUCTION OF PAIN AND HEALING OF COMPLEX LUPUS WOUNDS TO THE ABDOMEN, WHICH HAD BEEN PRESENT FOR 15 YEARS.

SUMMARY

A patient with extremely painful lupus wounds to her abdomen presented to the district nurses. The wounds had been present for approximately 15 years. Prior to Accel-Heal Solo therapy, her pain score was 7/10 (VAS) and she was taking a range of strong analgesia. She required alternate day dressings. Within six days of commencing the Accel-Heal Solo therapy, her pain had reduced to 5/10. Her pain had completely subsided within 19 days of commencing Accel-Heal Solo. The wounds were completely healed within 74 days.

BEFORE ACCEL-HEAL SOLO

A 47-year-old female presented to the district nursing team with multiple wounds to her abdomen due to a lupus rash, which had been present for several years and was extremely painful. Past medical history included:- chronic disease related malnutrition; femoral artery occlusion; amaurosis fugax; lupus erythematosus; depressive disorder; anorexia nervosa; irritable bowel syndrome; chronic liver disease; hyperthyroidism and Graves disease. She had been referred to the rheumatology team, but had not yet been seen by them. Sixteen open wounds were present, with the whole area measuring approximately 15 x 15 cm. Exudate levels were low. She had a very high pain score of 7/10 (VAS), despite taking morphine 10 mgs twice daily, paracetamol 1000 mgs four times daily and pregabalin 300 mgs twice daily. She was also applying heat pads topically.

DURING THERAPY

Accel-Heal Solo therapy was commenced, together with an anti-microbial cleansing solution, skin protectant, emollient and silicone foam border dressings. Dressings were undertaken by her husband with regular reviews by the district nurses. On day 6, her pain score reduced to 5/10 (VAS), and her husband reported that one of the wounds had already started to dry up and her skin did not appear so red.

AFTER THERAPY

The district nurses reviewed on day 19 and noted the surrounding skin to be significantly improved with no maceration, reduced inflammation and a reduction in the wound sizes. Her pain had completed subsided. All wounds were noted to be fully healed (74 days after commencing Accel-Heal Solo therapy). Her pain score remained 0/10 and she no longer required the use of any hot water bottles and she had managed to discontinue all her analgesia. She reported to the team that the device was amazing and that it had improved her quality of life dramatically.

PAIN SCORE REDUCED FROM 7/10 TO 5/10 (VAS) WITHIN 6 DAYS OF COMMENCING ACCEL-HEAL SOLO THERAPY

COMPLEX WOUND OF 15 YEARS DURATION, HEALED WITHIN 74 DAYS OF COMMENCING ACCEL-HEAL SOLO THERAPY

Figure 1. Abdominal wounds prior to Accel-Heal Solo therapy

Figure 2. Day 6. Abdominal wounds

Figure 3. Abdominal wounds healed 74 days after commencing Accel-Heal Solo therapy

Accel Heal

ELECTRICAL STIMULATION WOUND THERAPY

REFERENCES

1. Guest JF, Fuller GW, Vowden P (2020). Cohort study evaluating the burden of wounds to the UK's national Health Service in 2017/2018:update from 2012/2013. BMJ open 10:e045253. doi:10.1136/bmjopen-2020-045253
2. Murphy C, Atkin L, Swanson T et al (2020). International consensus document. Defying hard-to-heal wounds with an early antibiofilm intervention strategy: wound hygiene. J Wound Care; 29 (Suppl 3b):S1–28.
3. New research finds UK nurses carry out 180 wound dressing changes a year – on each chronic wound patient. [https://www.wounds-uk.com/news/details/new-research-finds-uk-nurses-carry-out-180-wound-dressing-changes-a-year-on-each-chronic-wound-patient-].
4. Price P, Fogh K, Glynn C et al. Managing painful chronic wounds: the Wound Pain Management Model. Int. Wound J. 2007. 4(Suppl 1):4-15.
5. Hellström A, Nilsson C, Nilsson A, Fagerström C. Leg ulcers in older people : a national study addressing variation in diagnosis , pain and sleep disturbance. BMC Geriatr. 2016:1–9.
6. Khouri C, Kotzki S, Roustit M et al. Hierarchical evaluation of electrical stimulation protocols for chronic wound healing : An effect size meta-analysis. Wound Repair Regen. 2017:883–891.
7. Guest J, Singh H, Rana K, Vowden P. Cost-effectiveness of an electroceutical device in treating non-healing venous leg ulcers: results of an RCT. J. Wound Care 2018; 27(4):230–243.
8. Prevention and Treatment of Pressure Ulcers: Quick Reference Guide. 2009. www.epuap.org/wp-content/uploads/2010/10/Quick-Reference-Guide-DIGITAL-NPUAP-EPUAP-PPPIA-16Oct2014.pdf
9. Piaggesi A, S L, F B, Al. E. EWMA document: advanced therapies in wound management: cell and tissue based therapies, physical and bio-physical therapies smart and IT based technologies. J Wound Care 2018; 27 (Suppl 6):1–137.
10. Magnoni C, Rossi E, Fiorentini C et al. Electrical stimulation as adjuvant treatment for chronic leg ulcers of different aetiology: an RCT. J. Wound Care 2014; 22(10):525–533.
11. Santamato A, Panza F, Fortunato F et al. Effectiveness of the Frequency Rhythmic Electrical Modulation System for the Treatment of Chronic and Painful Venous Leg Ulcers in Older Adults. 2012.
12. Nair H. Microcurrent as an adjunct therapy to accelerate chronic wound healing and reduce patient pain. J. Wound Care 2018; 27(5):296–306.
13. Turner N, Ovens L. The results of a clinical evaluation of Accel-Heal electroceutical treatment in a large NHS Trust. Wounds UK 2017; 13(4):92–99.
14. Turner N, L. Ovens. Clinical outcome results and quality of life improvements using electroceutical treatment - Patient perspectives. EWMA 2018, 2018.
15. L. Ovens. Supporting the Triple Aim Framework objectives in Scotland using an innovative electroceutical therapy to improve clinical and economic benefits for patients with venous leg ulcers (VLUs) Using an innovative electroceutical therapy to improve clini. Present. EWMA, 2019.
16. Lynch O, Kiernan C, Strapp H et al. A study to evaluate the effectiveness of the Accel-Heal electroceutical device as an adjunctive treatment to vascular foot ulcers. EWMA 2019, 2019.
17. Ovens L. Improving clinical ulcers (VLUs) using externally applied electroceutical therapy in a Community NHS Trust. Presented at Wounds UK; Harrogate, UK, November 2018.
18. Louison P, Sister S, Viability T, Study C. Management of recurrent venous leg ulcers with electroceutical therapy to improve pain , expedite healing and reduce risk of recurrence. Present. EWMA 2015. London, UK, 13-15th May, 2015.
19. Greaves T. Improving patient quality of life with innovative electroceutical technology: A case series. Present. Wounds UK, 2014. Harrogate, UK, November 2014.
20. Ovens L. Electroceutical therapy to manage complex leg ulcers: A case series of three patients. Wounds UK, 2014.
21. Ovens L. Getting it right for patients and budgets. Wounds UK 2015; 11(3):96–101.
22. N. Turner. Right Care , Right Time : - An evaluation using an electroceutical treatment to determine the clinical outcomes in a large NHS Trust.
23. Guest JF, Ayoub N, Greaves T. Clinical outcomes and cost-effectiveness of an externally applied electroceutical device in managing venous leg ulcers in clinical practice in the UK. J. Wound Care 2015; 24(12):574–580.
24. Ovens L (2022). What is the Role of Electrical Stimulation Therapy. Wound Masterclass Volume I; Issue 1. Available on-line at:- https://issuu.com/woundmasterclass/docs/wound-masterclass-june-2022?fr=sODc3OTU3MDAzMzU (accessed 22/03/23).
25. Kurz P, Danner G, Lembelembe J et al (2023). Activation of healing and reduction of pain by single-use automated microcurrent electrical stimulation therapy in patients with hard-to-heal wounds. Int Wound J;1-9. doi:10.1111/iwj.14071
26. Data on file 20191005JP
27. McCaig CD, et al. Physiol Rev. 2005;85(3):943-978;
28. Martin-granados C, Mccaig CD. Harnessing the Electric Spark of Life to Cure Skin Wounds. 2014; 3(2):127–138.
29. Atkin et al 2019. Accel-Heal Made Easy. www.wounds-uk.com/resources/details/made-easy-accel-heal-electrical-stimulation.
30. Nuccitelli R., Nuccitelli P., Li C et al (2011). The electric fields near human skin wounds declines with age and provides noninvasive indicator of wound healing. Wound Rep Reg: 19; 645-655.

Item	Size	Product code	PIP code	NHS code
1 x Accel-Heal Solo therapy available on FP10 in UK	7cm x 4cm x 2cm	K560-1	419-5251	ELZ752

Accel-Heal
Technologies Limited
Hever Business Centre
Hever, Kent, TN8 7ER

Distributed in Ireland by
MedEarly Healthcare Ltd.
please contact MedEarly
Healthcare Ltd by:
087 686 4939
louise@medearly.ie
www.medearly.ie

www.accelheal.com

1810_Print_Ready_Brochures _Case_Studies _Accel-Heal-Case-Study-Booklet-A4-S17