A next generation honey dressing

MEDIHONEY® HCS

Wounds UK

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UNDERSTANDING THE ROLE OF HONEY IN WOUND CARE

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INTRODUCTION

Honey has been used in wound care for centuries and has a wealth of evidence to support its use. Medical-grade honey is known to act as an antimicrobial, debridement and anti-inflammatory agent as well as having a positive impact on wound malodour and exudate. This introduction aims to explain the action of honey, present an overview of supporting evidence and highlight the key effects of honey in modern wound care.

What is honey?

Honey contains sugars — fructose, glucose, sucrose, carbohydrates, proteins and water — making a stable substance able to control the growth of pathogenic bacteria (Voidarou et al, 2011). Manuka honey, the most widely used medical-grade honey, comes from bees extracting nectar from the shrub *Leptospermum scoparium* (commonly known as manuka or jelly bush), which is found predominantly in New Zealand and Australia (see www.anbg.gov.au/leptospermum/leptospermum-scoparium.html). Honey has a range of therapeutic actions in wound care.

Honey as an antimicrobial

Medical-grade honey is gamma-irradiated to kill any potential micro-organisms, but retains its antimicrobial activity (Vandamme et al, 2013). In some honeys the antimicrobial action is based on hydrogen peroxide, which is released when the honey is diluted in exudate. Manuka honey is an extremely effective antimicrobial agent that uses a non-peroxide effect attributed to methylglyoxal (MGO) found in higher amounts in manuka honey when compared to other honey types. The action of MGO is not known specifically, but it is thought to increase permeability of the cell membrane and disrupt the metabolism of the bacteria (Mavric et al, 2008). Other components in honey are thought to contribute to its antimicrobial effect because honey inhibits cell division of MRSA even when MGO is not present (Cooper and Gray, 2012). Other effects of the non-peroxide activity of honey are to:

- extract water from the bacterial cell through a process of osmosis causing the cell to die off through dehydration (Mavric et al, 2008)
- lower the pH of the wound using the acidic nature of honey (pH 3.2–4.5), which prevents the growth of micro-organisms (Gethin et al, 2008)
- inhibit cell division of organisms such as *Staphylococcus aureus* and *Escherichia coli* (Seckam and Cooper 2013)
- change *Pseudomonas aeruginosa* so that the cell breaks down (lysis) (Cooper et al, 2002)
- exhibit a prolonged bactericidal effect (over 7 days) on *Clostridium difficile* (Hammond and Donkor, 2013).

Catalase in wound fluid breaks down hydrogen peroxide in honey, and so a honey that does not rely on hydrogen peroxide can still have an antibacterial effect in the presence of catalase (Molan, 2011). Honey also has an important role in disrupting biofilms as it breaks down the protective shield (extracellular polymeric substance) that forms around colonies of bacteria (Seckam and Cooper, 2013). To date, there is a low likelihood of resistance of bacteria to manuka honey (Cooper et al, 2010).

Honey as a wound deodoriser

Wound malodour is caused by a combination of the products of anaerobic bacteria, such as bacteroides, facultative anaerobes, such as *Pseudomonas aeruginosa,* as well as volatile fatty acids produced from dead tissue (Gethin, 2011). As stated above, honey has a range of disruptive, bactericidal and inhibitive effects on bacteria (Molan, 2006) and also uses its glucose to control volatile acids, which has the effect of reducing or eradicating wound malodour (Pieper, 2009) — a clear clinical benefit for patients (Gethin, 2011; Gethin and Cowman, 2008). Gethin and Cowman (2005) reported an eight-patient case series involving patients between the ages of 22–82 years and a range of acute and chronic wounds that had been present for up to 18 months. All wounds except a rheumatoid and a mixed aetiology ulcer showed between 54% and 94% healing after four weeks of treatment with manuka honey. Three patients had wound malodour pre-treatment with honey, which was completely eradicated after the honey was applied.

Honey as an anti-inflammatory agent

Chronic wounds are characterised by chronic inflammation. Excess white cells cause oxygen free radicals, which damage wounds and, in turn, increase white cell numbers. Honey has been shown to disrupt this cycle. Jull et al (2008) speculate that the benefit of using honey in burn wounds is due to the antioxidant effect as this type of wound exhibits high levels of oxidation causing poor healing. Another effect of honey is through phytochemicals (plant compound with an antioxidant effect) present in manuka honey, which inhibit free radical activity (Vandamme et al, 2013). A laboratory study on the effect of honey on cells implicated in prolonged inflammation, demonstrated that honey was able to modulate the activity of monocytes to release growth factors and anti-inflammatory agents. The initial pro-inflammatory effect of honey stimulates the release of tissue necrosis factor (TNF-α) and interleukin factors (IL-1β and IL-6), and regulates the body's immune response (Tonks et al, 2003). This function is thought to move cells out of a chronic inflammatory stage into a more regulated phase that facilitates wound healing (Molan, 2011).

Honey as a debriding agent

Debridement is a vital component of wound bed preparation as it removes devitalised tissue that impedes healing, increases the risk of infection and prevents effective wound assessment (Ousey and McIntosh, 2010). Honey has an osmotic effect due to the 'drawing' action of its sugar. This pulls lymphatic fluid into the wound bed, creating a moist wound environment, which facilitates autolytic wound debridement (Molan, 2009). Gethin and Cowman (2009) compared manuka honey to a hydrogel looking specifically at debridement in venous leg ulcers. The study involved 108 patients with at least 50% of the ulcer surface covered in slough. At four weeks the mean surface area of slough had reduced to 29% and 43% for honey and hydrogel respectively ($p=0.065$). At week 12, 44% vs. 33% of the wounds had healed ($p=0.037$). The debridement effect was thought to be due to the osmotic effect of honey drawing fluid through the wound and autolysis, facilitated by the moist wound and lowered pH (Gethin et al, 2008). There is also thought to be an increase in plasminogen, which when converted to plasmin by plasminogen activator, breaks down fibrin in the wound allowing for new granulation tissue growth (Hart, 2002).

Honey and the immune system

Honey stimulates monocytes to release cytokines or chemical messengers, which initiate the immune response to infection — the honey having a direct effect on the bacterial cell and also promoting the body's own defence mechanisms (Molan, 2009). Tonks et al (2003) discovered this monocyte activity after exposure to honey and suggested this helped to explain the positive effect of honey on wound healing. Simon et al (2006) described the use of honey in a paediatric oncology setting citing 15 cases that were immunocompromised (three were neutropenic) and had wound or catheter site infections. The positive outcomes resulted in the unit switching to honey rather than iodine for wound care in severely immunocompromised patients.

HONEY IN WOUNDS: USING THE EVIDENCE-BASE

There is evidence for beneficial effects of honey in superficial and partial thickness burn wounds (Jull et al, 2008). Vandamme et al (2013) highlighted in an evidence review of randomised controlled trials (RCTs) of burns that six out of seven RCTs found a statistically significant difference in time to healing and four out of seven studies showed a statistically significant difference for antibacterial activity. In painful wounds there is evidence to show a reduction in pain when honey is used (Misirlioglu et al, 2003; Molan, 2005). There are some reports of pain when honey is used, possibly due to its absorptive effects, but Molan (2005) suggests this may occur in wounds that are particularly inflamed, and Dunford and Hanano (2004) found that pain or discomfort was often transitory.

Evidence for honey encompasses a wide variety of wound types. Its action on inflammation, microbes, slough and exudate through its absorption properties, demonstrate its use through the inflammation and proliferation stages of wound healing. Robust RCTs are to be encouraged, but it is also important not to disregard other types of evidence to encompass the breadth of complex and challenging wound types and patient outcomes necessary in wound care (Box 1).

BOX 1: HOW TO INTERPRET THE EVIDENCE FOR HONEY

There is concern that systematic reviews (Jull et al, 2013) focus only on RCTs and that wound healing is the predominant inclusion factor. Vandamme et al (2013), in their systematic review concluded that the problem is not with the honey but with methodology and that more robust evidence is necessary to ensure that specific effects of honey are quantifiable. Cooper (2013), in a response to the Cochrane review, highlighted that complete healing tended to be the only outcome measured. She recommended that future reviews should widen parameters to consider additional wound care outcomes including antibacterial, exudate control, debridement and anti-inflammatory properties of honey. Mani (2006) reminded clinicians that it is important not to disregard the wealth and breadth of evidence for honey.

A NEXT GENERATION HONEY DRESSING

MEDIHONEY DRESSINGS RANGE

The Medihoney® range of dressings include: Medihoney® Antibacterial Medical Honey; Medihoney® Wound Gel; Medihoney® Gel Sheet; Medihoney® Apinate Dressing; Medihoney® Tulle Dressing and Medihoney® Barrier Cream. All products within this range of medical honey dressings are derived from *Leptospermum scoparium* (manuka). All products are sterilised by gamma irradiation, which does not affect the antibacterial properties of honey.

Medihoney dressings are primary dressings, which require a secondary absorbent dressing and are indicated for infected wounds and/or those requiring debridement (Cooper and Grothier, 2011). They can be used as part of wound bed preparation to:

- Promote a moist wound environment
- Remove non-viable tissue
- Reduce inflammation
- Reduce bioburden
- Reduce malodour
- Stimulate the immune system.

Recently, Medihoney® HCS has been introduced to complement this range of dressings. This is a versatile all-in-one dressing that offers clinicians the ability to optimise the significant benefits of Medihoney in an easy to use, low-profile dressing with the capacity to absorb exudate, while maintaining its structure.

INTRODUCING MEDIHONEY HCS

MEDIHONEY® HCS (hydrogel colloidal sheet) is an in all-in-one dressing that combines the properties of medical-grade honey with superabsorbent polymer (SAP technology) (see Box 2). This technology allows the cooling and soothing hydrogel component to increase absorption up to 2.5 times the amount of comparative dressings, while providing a moist environment for dry wounds (Simon et al, 2006).

How does it work?

On application, the dressing may initiate an increase in exudate as a result of the highly osmotic, low pH effect of honey. This can aid autolytic debridement by drawing fluid out of the wound and gently removing necrotic and sloughy tissue.

The SAP component incorporated into the dressing allows for optimal fluid handling and sequestration of bacteria and other harmful components found within the wound fluid (Wiegland et al, 2011). As fluid is absorbed into the dressing material, a gel is formed, locking in fluid containing bacteria, matrix metalloproteinases (MMPs) and other enzymes (Vachon and Yager, 2006; Wiegand et al, 2011). This assists in reducing the impediments to healing, improving oxygen diffusion and reducing protease levels in the wound (Robson et al, 2009).

BOX 2: WHAT IS SAP TECHNOLOGY AND WHY IS IT BENEFICIAL IN A DRESSING?

Superabsorbent polymers are compounds that can absorb and retain large volumes of liquid relevant to their mass. These can be non-ionic or ionic. Dressings containing non-ionic polymers, such as polyurethane foams, are used for wounds with low volumes of exudate. Dressings containing ionic polymers with increased absorption capacity, such as calcium alginate dressings, are suited for use in wounds with moderate to high levels of exudate. To improve the structural integrity, ionic SAPs can be cross-linked, increasing their absorptive capabilities while allowing them to remain intact despite the high volume of fluid uptake (Greenwood and Grothier, 2012).

Medihoney HCS is a non-adherent dressing and is available as a non-adhesive and adhesive sheet dressing (Figure 1)

Figure 1: Medihoney® HCS Non-Adhesive and Medihoney® HCS with Adhesive Border

Table 1 | Medihoney HCS Adhesive and Non-Adhesive dressings

Description	A moist wound dressing made of 63% active *Leptospermum* honey in combination with a hydrogel and superabsorbent polymers. The dressing contains ionic, cross-linked polymers, which increase the dressing's capacity to absorb exudate while maintaining its structure and integrity. NB: Medihoney HCS Adherent and Non-Adherent are both occlusive dressings. Medihoney HCS Non-Adherent requires tape, film or a retention bandage to hold it in place, while Medihoney HCS Adherent has an adhesive film border so does not require a secondary dressing.
Indications	Dry to moderate exuding wounds, including: ■ Diabetic foot ulcers ■ Leg ulcers (venous, arterial and mixed aetiology ulcers) ■ Pressure ulcers ■ 1st and 2nd degree burns ■ Donor sites ■ Traumatic wounds ■ Surgical wounds ■ Skin tears
Contraindications	■ Third degree burns ■ Patients with a known sensitivity to honey
Clinical benefits	■ All-in-one, easy-to-use dressing ■ No requirement for secondary dressing (adherent version) ■ Sequesters and locks in exudate components ■ Protects from maceration/strikethrough ■ Effectively handles fluid ■ Stays intact ■ Avoids too frequent dressing changes ■ Can be used under compression ■ Can be cut to size ■ Low profile ■ Gelatin-free

EVIDENCE FOR MEDIHONEY DRESSINGS

Medihoney dressings have a wide range and levels of evidence to support their use in a range of wound types (Table 2).

Table 2 | Summary of evidence for Medihoney dressings

Study reference	Therapy	Design	Selection criteria	Clinical outcomes
Johnson et al, 2005	Medihoney vs mupirocin	Open label RCT 101 patients	Catheter exit sites (haemodialysis patients)	No significant difference in incidence of bacteraemias
Regulski M, 2008	Medihoney calcium alginate	Case series 8 patients	Non-healing venous leg ulcers	Five healed within 6 weeks Three patients achieved at least 75% closure at 12 weeks
Gethin and Cowman, 2009	Medihoney vs hydrogel	Prospective, open label, multicentre RCT 108 patients	Patients with venous leg ulcers, at least 6 months in duration, not progressing under standard compression therapy, with >50% slough, not taking antibiotics	At week 4, the Medihoney arm had a 67% mean reduction of slough vs. a 53% mean reduction with the hydrogel group (p=0.053) At week 12, 44% of wounds healed in the Medihoney arm vs. 33% in the hydrogel arm (p=0.037)
Robson et al, 2009	Medihoney vs standard therapy	Open label RCT 105 patients	Wounds healing by secondary intention	Median time to healing in the Medihoney group was 100 days compared to 140 days in the control group. The healing rate at 12 weeks was equal to 46.2% in the Medihoney group compared to 34% in the conventional group (ie no statistical difference)
Smith et al, 2009	Medihoney calcium alginate	Case series 11 patients	Venous incompetence and non-healing venous leg ulcers that failed to respond to 4-layer compression, topical silver, non-adherent dressings, and antibiotic therapy	Complete wound closure was achieved within 3 to 4 weeks for all patients. The authors concluded that the effects of the dressing increased the speed of healing when used in combination with multilayer compression bandages
Johnson and Sinner, poster presentation, 2013	Medihoney HCS	Case series 3 patients	1. Full-thickness bilateral arm wounds (> 80% slough 2. Necrotic areas and 17 wounds on anterior bony prominences. Debris, eschar and malodour were present and the patient experienced pain on touch 3. Non–healing scalp area after cancer treatment and an episode of shingles. She reported pain, even with gentle touch	1. Healing was achieved at 2 weeks 2. Immediate comfort and odour reduction. By week 2, the wounds had reduced in size, malodour was eradicated and patient was pain free 3. Immediate relief (cooling sensation). Healing was achieved by week 3 The authors concluded the dressing facilitated pain- and odour-free dressing changes
Dillow P, poster presentation, 2013	Medihoney HCS (n=4) and Medihoney gel (n=2)	Case series 6 patients	Non-healing surgical sites, radiation dermatitis and tumour	All wounds exhibited signs of a decreased inflammatory response, an increase in healthy tissue or healing, and all patients reported a decrease in pain levels
Amaya R, poster presentation, 2013	Medihoney HCS	Case series 3 patients	Neonatal and paediatric wounds	All wounds underwent autolytic debridement and then went on to heal uneventfully
Biglari et al, 2013	Medihoney	Multicentre prospective observational	Various aetiologies (total 121 wounds) over a 2 year period. 32% were oncology patients	Overall wound size decreased significantly as did pain level. Levels of slough and necrosis decreased.

MEDIHONEY HCS DRESSING IN PRACTICE

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PRACTICAL APPLICATION

Medihoney HCS is a single product with multiple functions. It is simple to apply and can be easily managed by the novice clinician, the patient or a relative/carer.

The non-adhesive version is best used under bandaging, while the adhesive version can be used on most areas of the body. The low profile of the dressing makes it a suitable choice for use under compression therapy, including bandages and hosiery as it does not cause indentation. Frequency of dressing change will depend on the amount of exudate produced by the wound. The product can stay in place for up to seven days, and may be used to complete healing. The dressing is almost translucent allowing for good visual inspection of the wound without the need to redress unnecessarily.

Case studies

As outlined in Table 2, Medihoney HCS dressings play a therapeutic role in the management of a variety of acute and chronic wounds. The following case studies also demonstrate clinical effectiveness.

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CASE STUDIES

CASE 1: CHRONIC LOWER LIMB ULCERATION

Lorraine Grothier, CNS, Tissue Viability, Provide, Essex

BACKGROUND

A 51-year-old lady presented to the tissue viability service following a trauma to the gaiter area of her left leg. Her local practice nurse used Steri-strips and foam dressings for what initially appeared to be a skin tear. However, the wound deteriorated, leading to chronic lower limb ulceration. Her complex medical history included type 1 diabetes, asthma, depression and essential hypertension. She also had previously suffered from a myocardial infarction, pulmonary embolism and had been treated for deep vein thrombosis in both legs. She reported that she was a smoker, however she declined a referral to the smoking cessation service.

Following a full holistic assessment it was established that her ankle brachial pressure index (ABPI) using a hand held Doppler was 1.0 to the left leg and 1.05 to the right leg. The wound was photographed with consent and mapped. The wound measured approximately 35mm x 30mm, she had mild oedema below the knee and complained of moderate discomfort.

Initially minimal sharp debridement followed by larval therapy was used to remove the devitalised tissue. The wound depth measured 5mm. A portable negative pressure wound therapy device (PICO, Smith & Nephew) was applied to assist wound healing. Class 2 (British standard) compression hosiery was applied to reduce venous hypertension and control the oedema. Although complete wound healing was achieved within six months the patient re-presented to the clinic shortly after as the skin had broken down at the site of the previous wound. On this presentation the wound measured 14mm x 14mm with localised erythema and 100% devitalised tissue.

Previously the treatment had required 2–3 visits a week to the clinic which had proved disruptive to the patient's lifestyle — she worked full time and found it difficult to attend such frequent appointments. Therefore, following discussion with the patient, it was decided to use a less interventionist approach, which could in part be managed by the patient. The initial objectives were to debride the devitalised tissue and manage bacterial bioburden to prepare the wound bed for healing. The approach used meant the patient could self-manage her skin care and hosiery between clinic visits. However, due to rapid healing in this case, minimal visits were required.

TREATMENT

Medihoney HCS with an adhesive border was chosen as the primary dressing. This was considered the most appropriate dressing as it has multiple functions including the ability to debride, absorb and reduce bacterial bioburden while maintaining a moist wound surface essential for cell migration. She was able to wear it comfortably under her compression hosiery without any difficulty, pain or adverse effects.

OUTCOME

The patient reported she had found the dressing comfortable and soothing. She returned to the clinic three days later. The dressing was removed easily and in one piece. There was no evidence of maceration to the periwound area and symptoms of localised infection had subsided. The patient was pain-free, the eschar had softened and lifted, and the area was covered with 100% epithelialised tissue. One week later she was transferred to the well-leg clinic.

The first episode of care required several products and interventions. Using a dressing that has multiple modes of action led to rapid debridement and accelerated healing. Medihoney HCS was used successfully for wound bed preparation and the patient reported she was very satisfied with the treatment and the clinical outcome of care.

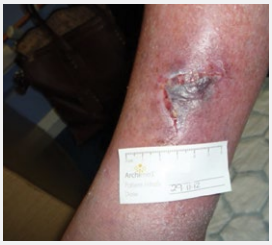

Figure 1: Wound on initial presentation before further breakdown

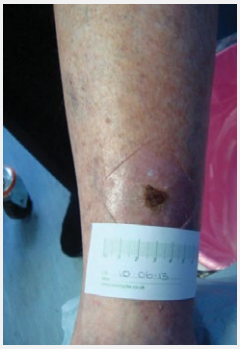

Figure 2: Patient re-presented to clinic shortly after healing

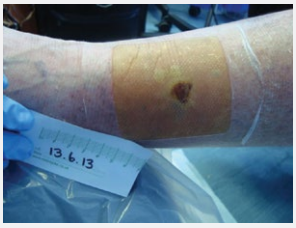

Figure 3: Medihoney HCS dressing in place

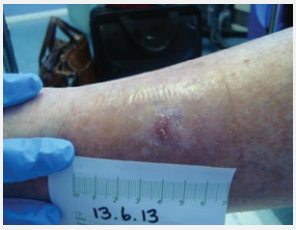

Figure 4: Epithelialising wound

CASE 2: LOWER LIMB ULCERATION

Lorraine Grothier, CNS, Tissue Viability, Provide, Essex

BACKGROUND

An 85-year-old gentleman presented to the clinic with ulceration to his right medial gaiter, extending on to the malleolus. The patient stated that the ulcer had developed following a fall while he was on holiday five weeks earlier. He was referred by the practice nurse for an assessment when the ulcer failed to heal. His medical history indicated that he had atrial fibrillation, chronic kidney disease, hyperthyroidism, hypertension and he had previously suffered two transient ischaemic attacks. A full holistic assessment was carried out including establishing his vascular status using a hand held Doppler. His ankle brachial pressure index (ABPI) was 1.1 to the right leg and 1.2 on the left leg.

On presentation the ulcer measured 55mm in length x 42mm wide; there was a 95% thin layer of yellow slough and devitalised dry scales to the periwound area. It had been previously treated with an absorbent dressing and modified compression 23mmHg using multilayer bandaging. He had also received previous courses of antibiotics for repeated wound infections. Moderate to heavy exudate and mild odour were present.

TREATMENT

Medihoney HCS was applied to absorb exudate, reduce bacterial bioburden and facilitate autolytic debridement. A skin protectant was applied to prevent maceration of the periwound skin. The patient was able to mobilise and could get to the GP practice independently, although he relied on his daughter to bring him to the clinic. The patient was previously in a modified compression bandaging system, but due to reports of pain at night and, as a precaution, the compression was reduced to Class 1 hosiery. The patient found this very comfortable and care could now be shared with his practice nurse. Dressings were changed twice weekly for four weeks.

OUTCOME

At review (two weeks) there was good evidence of debridement with a significant reduction in devitalised tissue. The wound had reduced in size to 53mm length x 35mm width. There was no odour present and exudate had reduced. The periwound area had slight maceration to the distal end of the wound, but was not extending. The nurses found the dressing easy to apply, conformable and exudate did not breach the dressing. The patient remained comfortable and did not express that he felt any pain during dressing change or between visits. Following four weeks' treatment with Medihoney HCS, bacterial bioburden was controlled and treatment was continued with a non-adherent absorbent dressing to prevent any damage to the periwound skin and manage exudate.

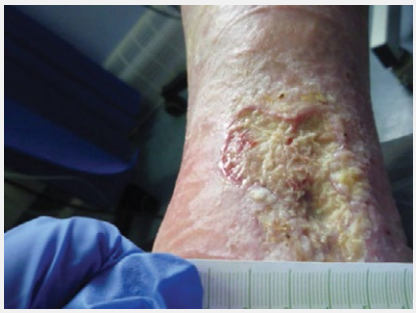

Figure 1: Wound at initial presentation

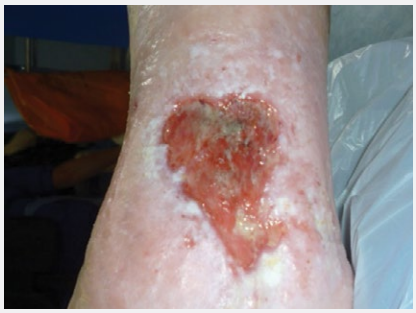

Figure 2: Two weeks after treatment with Medihoney HCS

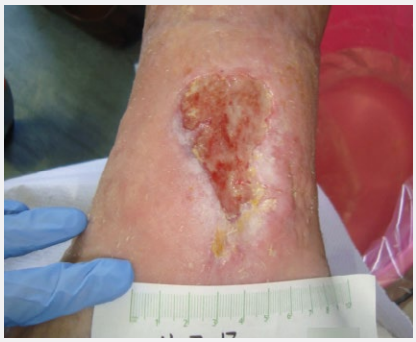

Figure 3: Four weeks after treatment with Medihoney HCS

CASE 3: RECURRENT LEG ULCERATION

Lorraine Grothier, CNS, Tissue Viability, Provide, Essex

BACKGROUND

An 81-year-old gentleman was admitted to the community hospital for bed rest in an attempt to improve persistent oedema and overall general health status. He had been known to the tissue viability service for the past two years with recurrent episodes of leg ulceration. His medical history included chronic stage 3 kidney disease, venous hypertension, leg ulceration and delusional disorder, which made concordance with treatment regimens difficult. More recently he had suffered two episodes of cellulitis within an eight-week period. The wound had been treated with a DACC-coated dressing due to recurrent infection and a modified compression bandage regimen (23mmHg at the ankle) to reduce oedema.

The patient was re-assessed on admission to the ward and his ankle brachial pressure indes (ABPI) was 1.0 with biphasic waveforms recorded. The wound on the posterior aspect of the gaiter region of his left leg measured 43mm in width and 20mm in length. The wound was assessed using the TIME framework. The wound bed contained 80% superficial devitalised tissue and 20% granulation tissue. The wound was extremely malodorous with moderate exudate levels. The surrounding skin was dry and flaking. He did not complain of any pain.

TREATMENT

Following a discussion with the patient and the nursing staff it was agreed that Medihoney HCS would be applied to debride the wound, absorb the exudate and reduce bacterial bioburden. The dressing was changed every third day and the leg was washed in warm water. The surrounding skin was treated with a moisturiser applied at regular intervals to help maintain skin integrity. While in hospital the compression regimen was changed to toe caps as he experienced persistent oedema in his toes; a hosiery garment was used to apply 25mmHg at the ankle. The patient remained comfortable and the ward nurses, who were not skilled in the application of compression bandaging, felt confident to manage the wound over the weekend periods when tissue viability input was unavailable.

OUTCOME

The staff reported that the dressing had remained in place and there had been no need for them to change this between the tissue viability nurse's visits. The hosiery was easy to remove and apply over the top without displacing the dressing. The exudate was contained and did not breach at any time throughout the wear time. After three days the odour had completely disappeared. This subsequently enhanced the patient's quality of life. The devitalised tissue was debrided 100% leaving a granulating wound bed. It was felt appropriate to continue with the treatment for a further 10 days to optimise the wound for healing. By the end of the two-week treatment period, the wound had decreased in size to 33mm width and 14mm length and epithelial tissue was present at the wound margins.

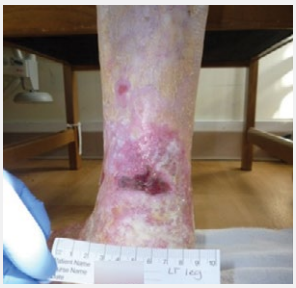

Figure 1: The wound on presentation

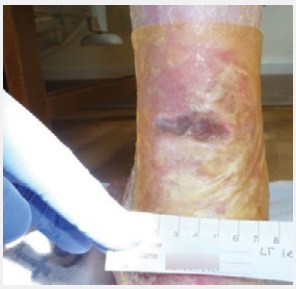

Figure 1: Medihoney HCS dressing in place

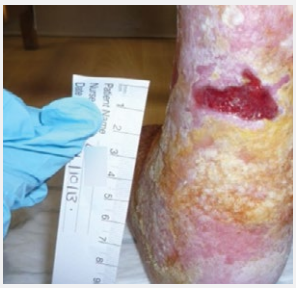

Figure 3: Review 3 days later

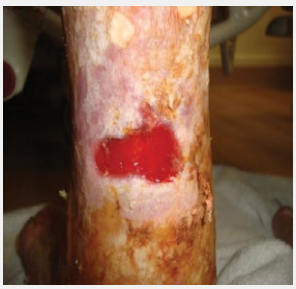

Figure 4: Progress at next dressing change (3 days later)

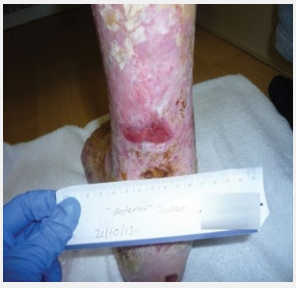

Figure 5: Two weeks after treatment with Medihoney HCS

CASE 4: TOE NECROSIS IN NEONATE

Rene Amaya, Paediatric Infectious Diseases Specialist, Houston, Texas, USA

BACKGROUND

A 23-week-old male neonate presented to the neonatal intensive care unit (NICU) with complications, including respiratory distress, acididosis, hypotension, which required support with dopamine and hydrocortisone. He'd had multiple episodes of sepsis, undergone bilateral hernia repair, and had multiple wounds. The patient developed dry, eschar necrosis of his left toes. Surgical consultation recommended toe amputation.

TREATMENT

Paediatric Wound Care was consulted on day of life (DOL) 21. Medihoney Wound Gel was applied to the distal toes and Medihoney HCS chosen for the forefoot area.

Medihoney was selected as the treatment of choice for this premature neonate due to its ability to provide a moist healing environment, which would encourage granulation tissue formation and epithelialisation. In addition, the osmotic potential of the dressing assisted in the removal of dead tissue, exudate and wound contaminants. By DOL 30, eschars from the left foot toe lesions had started to loosen and by the following day clear, pink new skin was apparent. By DOL 31, the toes were left open to the air with no additional Medihoney dressings needed. No negative side effects were noted in this premature neonate.

OUTCOME

The dry eschar was debrided within two weeks, avoiding the need to amputate the toes. All toes were viable.

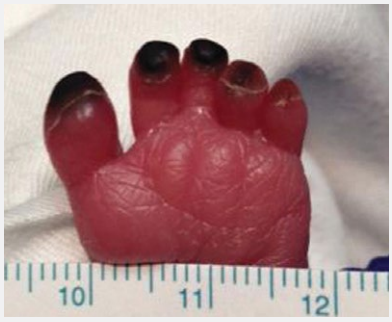

Figure 1: Distal toes are dry and necrotic (DOL 21)

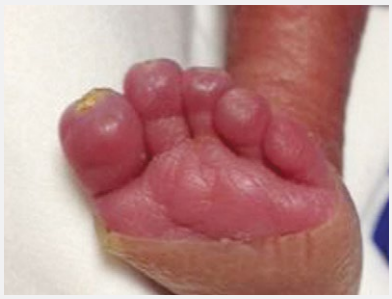

Figure 2: After two weeks of treatment with Medihoney Wound Gel to the toes. All eschar removed, revealing healthy, pink intact underlying skin (DOL 31)

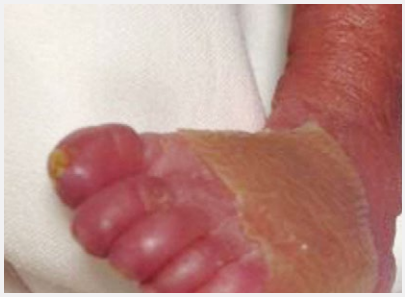

Figure 3: Medihoney HCS dressings were applied to the forefoot area (DOL 31)

CASE 5: PAEDIATRIC FACIAL LESIONS

Rene Amaya, Paediatric Infectious Diseases Specialist, Houston, Texas, USA

BACKGROUND

A 15-year-old female patient developed severe right-sided facial cellulitis with vesicular and ulcerative lesions measuring 8cm x 8cm with a depth ranging from 0.1cm to 0.3cm. The wound bed comprised 100% slough or hyperpigmented eschar. There were multiple full-thickness and partial-thickness open wounds scattered over the right side of face with oedema and erythema. Tests revealed no clear aetiology to explain the infection.

TREATMENT

Medihoney HCS was initiated on 8 November. The patient was allergic to the antibiotics given and it was felt that a topical antibacterial dressing would be beneficial. Medihoney HCS offered a pain-free application and removal and the patient and family were able to visualise the wound bed with the dressing in place.

OUTCOME

By 21 November all eschar was removed with 50% slough remaining in the wound bed. There was no residual crusting. There was evidence of healing with 50% granulation tissue. By 4 December (four weeks) there was no slough and the wounds were almost completely granulated. This patient was lost to further follow up.

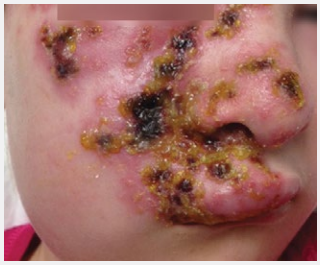

Figure 1: Before application

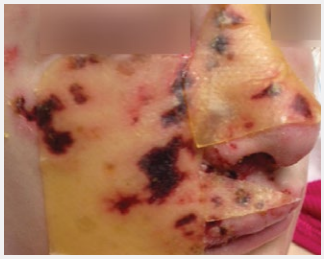

Figure 2: At start of therapy with Medihoney HCS

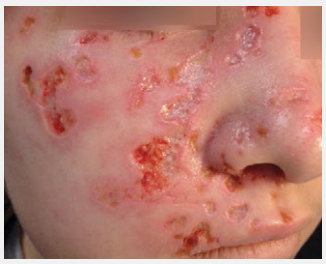

Figure 3: 4 days after the start of therapy. All eschar removed with 50% slough remaining and no residual crusting

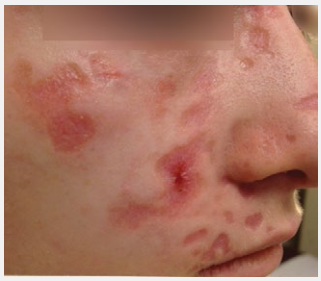

Figure 4: 4 weeks after start of therapy, all slough removed and the wounds were almost completely granulated or epithelialised

NOTES

MEDIHONEY®
Antibacterial Dressing

Description	Reference	Size	Unit/Box	PIP Code	NHS Code
Antibacterial Wound Gel	391	10 g	20/box	314-1207	ELZ013
	395	20 g	5/box	314-1215	ELZ507
Antibacterial Medical Honey	398	20 g	5/box	314-1223	ELZ508
	405	50 g	1/box	344-1490	ELY302
HCS *Non-Adhesive*	780	6 cm x 6 cm	10/box	382-2491	ELM200
	781	11 cm x 11 cm	10/box	382-2525	ELM201
	784	20 cm x 20 cm	5/box	401-5988	EKB089
	785	20 cm x 30 cm	2/box	401-5996	EKB090
HCS *Adhesive*	782	Inner: 7.2 cm x 7.2 cm Outer: 11 cm x 11 cm	10/box	382-2509	ELM202
	783	Inner: 11.5 cm x 11.5 cm Outer: 15 cm x 15 cm	10/box	382-2517	ELM203
HCS *Surgical* *(Adhesive)*	787	Inner: 4.5 cm x 16.5 cm Outer: 7.5 cm x 20 cm	10/box	403-1779	EKB094
Apinate™ *Rope*	793	1.9 cm x 30 cm	5/box	366-5429	EJE077
Apinate™ *Dressing*	794	5 cm x 5 cm	10/box	366-5411	EJE076
	795	10 cm x 10 cm	5/box	347-0929	EJE000
Antibacterial Tulle Dressing	796	3-Ply, 10 cm x 10 cm unfolds to 30 cm x 10 cm	5/box	346-3346	EJE067
	797	3-Ply, 5 cm x 5 cm unfolds to 5 cm x 15 cm	5/box	400-9346	EKB093
Gel Sheet Dressing	798	5 cm x 5 cm	10/box	340-3995	EJE065
	799	10 cm x 10 cm	10/box	340-4001	EJE064

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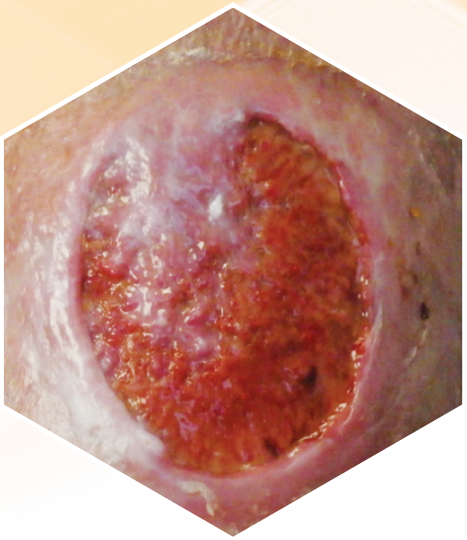
MEDIHONEY®
Antibacterial Dressing

PATIENTS WITH STALLED, NON-HEALING VENOUS LEG ULCERS?

Discover MediHoney dressings to help manage your Continuum of Care:

Aid and support autolytic debridement and a moist wound healing environment in chronic wounds and burns[3-7]

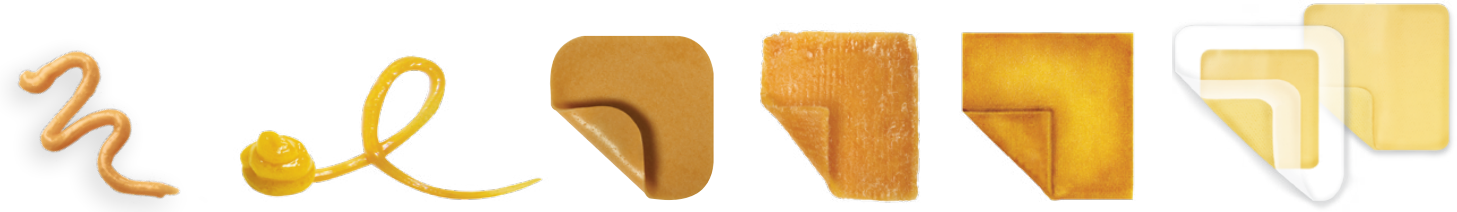


Provide broad spectrum antimicrobial activity[1,2]

Made with honey with low pH of 3.5-4.5[8] > Lowering pH has been associated with wound healing benefits[9]

Help reduce malodour[10]

Have been safely used on patients of all ages



Medical Honey | Wound Gel | Gel Sheet (Sodium Alginate) | Apinate (Calcium Alginate) | Tulle | HCS (Absorbent Hydrogel)

1. Molan, Bee World. 1992; 73, 5–28. 2. Blair S.E. et al. Eur J Clin Microbiol Infect Dis. 2009; 28, 1199–1208. 3. Regulski, M. A novel wound care dressing for chronic leg ulcerations. Podiatry Management. 2008: November: 235-246. p. 235-246. 4. Robson, V., Dodd, S and Thomas, S. Standardized antibacterial honey (MediHoney®) with standard therapy in wound care: randomized clinical trial. Journal of Advanced Nursing, 2009;565-575. 5. Bateman S, Graham T. The Use of MediHoney® Wound Gel on surgical wounds post-CABG. WOUNDS UK; 2007; (3);76-83. 6. Cadogan J. The Diabetic Foot Journal; 2008; (1);43-45. 7. Duncan CL, Enlow PT, Szabo MM, Tolchin E, Kelly RW, Castanon L, Aballay AM. Adv Skin Wound Care. 2016 Aug;29(8):349-55. doi: 10.1097/01.ASW.0000484666.83140.b0. 8. Boyar V. et al, Journal of Perinatology, 2014, 34, 161–163; doi:10.1038/jp.2013.158. 9. Grothier L., Cooper R., MediHoney Dressings made easy, Wounds UK, vol 6, issue 2, nov. 2011. 10. Robson V et al. The British J Oral & Maxillofacial Surgery. 2012;50(4):321-327.