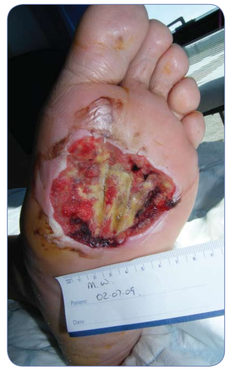
# The use of honey in diabetic foot ulcers - A retrospective view of our caseload

Pam Kirby, Andy Fisher, Elaine Emmerson, Jane Thompson, and Devaka Fernando, Sherwood Forest Hospitals Diabetic Foot Team (SFHDFT)



*02.07.09 - On discharge, and post Topical Negative Pressure Therapy. Commenced Algivon*

## Introduction

**Diabetic foot ulcers present many challenges, and may be acute, following surgical debridement, or chronic wounds but both types often expose deep structures such as tendon or bone in the base. This creates a high risk of infection that can easily spread due to the poor inflammatory response in a neuropathic foot, (Edmonds, Foster and Vowden, 2004).**

After becoming aware of the claims for the use of Manuka honey and evaluating its performance in a in a couple of typical foot ulcers, the Sherwood Forest Hospitals Diabetic Foot Team (SFHDFT), decided to explore the use of honey to demonstrate the most appropriate wound types for its application.

## Inter-professional approach to care

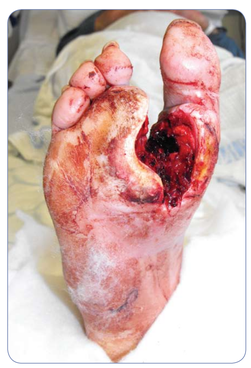
To ensure all aspects of care are covered, many professionals are involved in the diabetic foot team. Wound care is only one aspect of that input, but cannot succeed without addressing the other factors such as

- **Blood supply**
- **Pressure relief, redistribution**
- **Metabolic control**
- **Infection**
- **Patient education**

*Edmonds and Foster, (2000)*

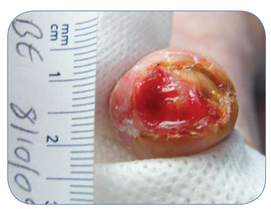
## Method

For this study, the team wanted to explore and streamline the dressing protocol. To do this the rationale was, honey for all wounds unless they were large and exuding, e.g. immediately following a ray amputation of a toe plus partial metatarsal, where there is a large granulating area.

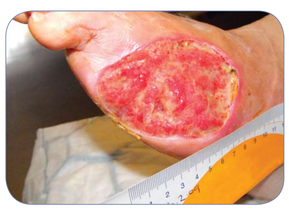


Topical Negative pressure or absorbent silver dressings were used in these cases.

Liquid honey was used for all small wounds or sinuses, and honey alginate for all others.



*Apex of the toe, where liquid honey is used*



*Wound for Honey alginate*

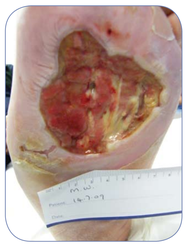
The selection of suitable secondary dressings helped to prevent maceration or desiccation, whilst allowing good contact with the wound bed, by moulding to the contours.

As we used more honey we adapted our practice to reflect the requirements described above by Molan, (2002)

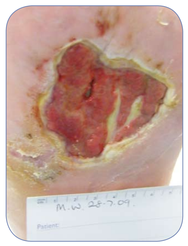
- the use of foam dressings with honey gel over small, less exuding areas, and alginate pads over honey alginate for larger and exuding wounds helped control the moisture balance

- removal of residue to reveal the true wound bed and type of edge, and surrounding skin

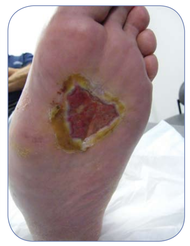
This applied theory to practice utilising the TIME principles for diabetic feet, (Edmonds, Foster, and Vowden, 2004).



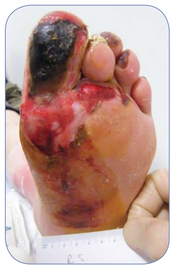
*14.07.09 Granulation forming and tendons beginning to cover*



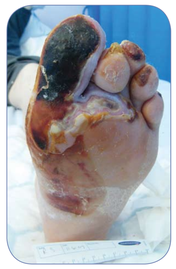
*28.07.09 Continued progress*



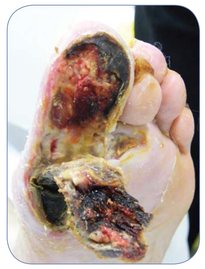
*25.08.09 Almost complete cover of tendons with honey residue in the margins*



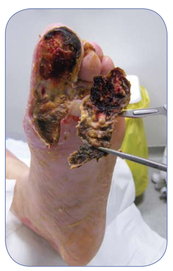
*03.06.09 Initial presentation*



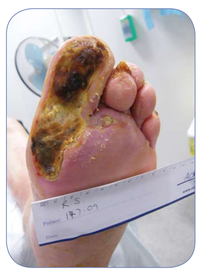
*11.06.09 1 week into treatment*



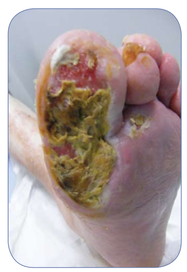
*07.07.09 during the debridement process*



*07.07.09 Piece of necrotic tissue removed due to ease of handling*



*14.07.09 1 week post debridement The honey has absorbed into the sloughy tissues and is holding them firmly once more, whilst the margins are separating*



*25.08.08 Further slough is removed and healthy granulation is appearing beneath*

## Results

SFHDFT were impressed with the performance of honey, wound healing progressed rapidly – which is anecdotal, but we began to notice:

- **Necrosis is rehydrated whilst not becoming wet and slippery**
- **Sloughy tissues acquire a degree of firmness allowing ease of sharp debridement**
- **As firm tissue was removed, the exposed wet layer beneath had become firm by the next appointment**
- **Granulation tissue looked healthy and epithelialisation was taking place**
- **Bones and tendon were covering with granulation tissue**
- **The reported pain by some patients was not a problem for this neuropathic group of patients**
- **Malodour is reduced**

Some explanations can be found in table 1, which also refers to the TIME principles of wound bed preparation.

| TIME principles | Wound requirements | Manuka Honey Characteristic |
|---|---|---|
| Tissue non-viable or deficient | Removal of dead tissue and debris from wound bed | Moist environment, plus low pH produce ideal conditions for auto-debridement and growth of new granulation tissue, (Gethin, Cowman and Conroy, 2008) |
| T | Staged sharp debridement of resistant slough and necrosis | Crystallisation of slippery tissues allows easy handling to grip slough |
| Infection or inflammation | Reduction of inflammation | Phytochemicals also provide antioxidant activity, allowing the wound to move to next stage of the healing process, (Molan, 2006) |
| I | Protection of exposed bone and tendon from bacteria | High osmolarity, slow release of hydrogen peroxide, low pH and phytochemicals, provide broad spectrum anti-microbial action, (Molan, 2006) |
| Moisture imbalance | Moist environment | Alginate sheet or Gel provides choice to balance absorption/ donation of fluid |
| M | Appropriate dressing regimen | By the application of sufficient honey and a suitable secondary dressing inflammation is reduced thereby reducing exudates levels, (Molan & Betts, 2008) |
| Edge of wound | Regular re-assessment of wound progress | Above features provide ideal conditions to control the wound environment |
| E | Inter-professional approach to fulfil TIME objectives | Cannot be achieved by a single dressing but needs to be accompanied with regular sharp debridement of callus, rapid response to infection and the establishment of blood supply, (Edmonds, Foster & Vowden,2004) |

## Discussion

There have been concerns regarding the topical use of glucose in diabetic patients though anecdotally we noticed no affect. However, this led us to another study into the effect of honey on blood sugar levels to be published in the New Year.

As the method of antibacterial protection includes a steep drop in pH, a recorded side effect is pain in the wound bed. Due to the fact that many diabetic foot ulcer patients are neuropathic, this consequence was generally not an issue for our caseload.

Sufficient honey is necessary to create anti-inflammatory properties which in turn will reduce exudate levels, (Molan & Betts 2004) and needs to be managed by the secondary dressing. Control of exudate is important, not only to maintain a moist environment, but 2 patients excluded themselves from the evaluation early because of the effects of maceration and subsequently would not try it again. Another issue for patients is that honey is messy and leaves residue in the margins, which needs cleaning to ensure the wound edge remains healthy. However many patients have read about the use of Manuka honey and are receptive to its use, viewing it as a "natural" product.

The claims for antibacterial protection were not specifically evaluated, as we have no control group for comparison, though, several serious wounds were treated with honey and did not become infected or require antibiotics e.g. patients MW and RS in the poster.

## Conclusion

The benefits of using Manuka honey in diabetic foot ulcers are that:

- **It has an adaptability to suit a variety of wound types, and meets the requirements for modern wound management, whilst fulfilling the TIME principles. This depends on the provision of a suitable secondary dressing to manage the exudate, without diluting the honey which alters its characteristics and can reduce its performance.**
- **Malodour is reduced which is associated with bacterial colonisation, and also helps to meet the psychological needs of our clients.**
- **Many patients with deep wounds and exposed bones and tendons did not develop infections**
- **There is crystallisation of stringy tissue which aids sharp debridement and was a benefit we had not expected and not seen reported elsewhere**

The team continue to use Manuka Honey products and will carry on evaluating its performance.

## References

*Edmonds, M., Foster, AVM, Vowden, P., (2004) Wound Bed Preparation for Diabetic Foot Ulcers, European Wound Management Association. Position Document: Wound Bed Preparation in Practice. London; MEP Ltd*

*Gethin, C.T. Cowman, S., Conroy, R.M. (2008) The impact of Manuka honey dressings on the surface pH on chronic wounds; International Wound Journal, June; volume 5, number 2.*

*Molan, P.C. (2006) Using Honey in Wound Care; International Journal of Clinical Aromatherapy, Volume 3: Issue 2*

*Molan, P.C. & Betts J.A. (2008) Using honey to heal diabetic foot ulcers Advances in Skin & Wound Care: July - Volume 21 - Issue 7 - pp 313-316*

*Molan, P.C. & Betts J.A. ( 2004) Clinical usage of honey as a wound dressing: an update. Journal of Wound Care: October, Volume 13. no.9*