Debrisoft: Revolutionising debridement

Preparation is everything

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The boundary between physical cleansing and debridement is difficult to define. The aim of both is to remove devitalised tissue, accumulated protein-rich adherent slough, particulate matter and foreign bodies from the wound and periwound area (Steed et al, 1996; Bale, 1997; Vowden and Vowden, 1999a) and both are integral to the management of the wound, the periwound skin and the control of bacterial load. It is widely accepted that periwound skin cleansing to manage accumulation of skin debris, accumulated skin care products such as emollients, wound dressing material and adhesives and wound debridement are essential components of good wound care. The role of cleansing to the wound bed itself has, however, been challenged by Lawrence (1997) who felt that such procedures simply redistributed rather than removed bacteria from the wound, favouring irrigation rather than physical cleansing as a management method.

Necrotic, devitalised tissue, which may re-accumulate continuously, is seen as a barrier to healing and a potential source of nutrients for bacteria as well as acting as a focus for continued sepsis and inflammation within a wound. Initial debridement, which is necessary to fully assess the extent of a wound, may be achieved through a number of techniques that range from surgical and sharp debridement, larval debridement to autolytic debridement (Vowden and Vowden, 1999a; b). The appropriate selection of a debridement technique may be limited by available skills and equipment and will depend on the wound status and the timeline for the debridement process (European Wound Management Association, 2004; Gray et al, 2011). Many of the more advanced debridement methods require access to specialist equipment and a high level of skill and may not be appropriate for the community nurse working in the patient’s home. The removal of necrotic tissue and slough is an ongoing process that needs to be integrated into the care of the wound throughout the healing process, a process often referred to as maintenance debridement (Falanga et al, 2008).

Increasing knowledge of the role of inflammation and infection as barriers to healing highlight the importance of effective management of re-accumulating debris in the wound. Biofilms and elevated proteases are now seen as targets for directed therapeutic interventions using a range of advanced wound care products (Becker et al, 2009; Harding et al, 2011). Such interventions are more likely to be effective if adequate attention is paid to managing the wound bed, and in particular accumulated slough, using maintenance debridement as an ongoing component of good wound care.

References
Introduction to Debrisoft®

Debrisoft® is a unique product designed to cleanse the wound and periwound skin and debride the wound by removing loose eschar and adherent slough. The product is provided with bound edges and a knitted outer surface coated with polyacrylate, and has a soft, fleecy appearance and feel. The contact layer consists solely of soft polyester fibres with angled tops and excellent flexibility that allow the contact layer of the Debrisoft to reach all areas of the wound bed even in an uneven wound; a 10 × 10 cm area of Debrisoft contains more than 18 million fibres. The fibres themselves, which are inert, are of a specific length, thickness and density that allows them to loosen necrotic tissue, keratoses and adherent exudate from the wound and surrounding skin, absorbing and binding the debris within the fibres. The pictures below demonstrate the appearance and structure of Debrisoft and show how slough, wound debris and bacteria are held within the unique fibre structure of the Debrisoft. The soft nature of the product allows relatively non-traumatic debridement and cleansing with minimal discomfort. Material testing has demonstrated that the Debrisoft does not shed fibres while in contact with the wound (Haemmerle et al, 2011).

Our experience with Debrisoft supports that reported in the case studies in this booklet and indicates that this method of cleansing and debriding would be suitable for use in a wide range of clinical situations, wound types and care facilities. It is not dependent on health professional skills and provides all staff with an easy-to-use, rapid and adaptable method to remove debris and biofilm from both the wound bed and the surrounding skin. To debride the wound, simply wet the Debrisoft with saline or an antimicrobial solution and wipe the wound using only light pressure for 2-4 minutes. When more adherent slough is encountered debridement can be continued for longer, or on more than one occasion, according to patient tolerance. The process is generally pain free and well tolerated without adverse events. Haemmerle et al (2011) reported that Debrisoft removed almost all debris while leaving healthy granulation tissue and islands of epithelial tissue intact.

We have found the product useful in patients with hyperkeratosis, venous leg ulceration, pressure ulceration and diabetic foot wounds. It has been well tolerated and, in the majority of cases, effective. Bahr et al (2011) on an extended case series conclude that: ‘this product could replace several modes of debridement based on its efficacy, short procedure, ease of use and patient comfort’.

We, however, also see this product as an adjuvant to existing methods, providing staff with a simple method of maintaining debridement in a variety of clinical situations. In so doing it could potentially prevent the need for repeated use of advanced wound care debridement products and techniques. These observations are, however, only based on isolated clinical observations and case studies and more data is required to establish the precise role of Debrisoft and its mode of action in terms of changes in the bacterial load and biochemistry of the wound bed and subsequent wound healing.

Our experience has been limited to the use of Debrisoft on chronic wounds; however, it may also prove to be a useful product for use in acute and traumatic wounds, where removal of dirt and other foreign material from the wound is an important element of care.

These initial reports suggest that Debrisoft is a unique, highly effective, simple-to-use, safe and well-tolerated debridement and cleansing agent that is applicable to a wide range of wound types and clinical situations, and that it is suitable for use both in hospital and community settings, including the patient’s own home.

Peter Vowden and Kathryn Vowden

References


Case study 1: Mrs B

Background
Mrs B is 80 years old with type 1 diabetes mellitus. She had been visited by the community nurses for the previous 12 months with chronic non-healing wounds on the upper shins of both legs. During this time she had also been attending both the dermatology and the vascular departments at the local hospital for advice on management. She lives with her daughter.

Vascular assessment both in the hospital and community had demonstrated that compression therapy was not appropriate. In addition, repeated infections, persistent inflammation and associated pain meant that treatment interventions were limited.

When referred to the tissue viability service she had bilateral ulceration. On her right leg there were over 12 cherry-like lesions that were very painful and bled easily. She was on antibiotic therapy for an episode of cellulitis in this leg. Her right leg had an area of approx 8 × 4 cm that was covered in dry skin with minimal exudate (Figure 1). Her analgesia for pain relief included Oramorph prior to dressing change. A diagnosis had not been confirmed but based on the clinical appearance of her right leg and medical history, a diagnosis of necrobiosis lipoidica had been made. On previous visits the nurses had attempted to lift the dry skin to the left leg but it had not been possible because of the pain and discomfort. If allowed to build up, this damaged the fragile epithelium underneath. Even with soaking when the nurses tried to lift the skin with forceps, the friable granulation tissue underneath would bleed. As a result she had become anxious, anticipating discomfort whenever the dressing was changed.

Treatment
To help to lift this tissue it was decided to use Debrisoft. This product is designed to remove wound debris, slough and hyperkeratotic tissue. This was moistened with water and the area was carefully washed using Debrisoft. Despite being anxious about the procedure, the patient did start to relax and said that there was less pain compared to when the procedure was carried out using forceps. Gradually the skin was lifted until the wound base was exposed.

During this procedure there was little pain or discomfort and there was no bleeding of the tissue underneath the dry skin. The granulation tissue underneath was intact without bleeding and there was epithelium around the wound edges.
**Conclusion**

I have used this product on a number of patients and have found that it provides rapid debridement without causing trauma to the wound. On this occasion it was the community nurses who were carrying out the procedure and despite initial concerns about causing trauma to the wound surface, they quickly became confident that they could use Debrisoft without causing discomfort to the patient or trauma resulting in bleeding.

This product did aid rapid debridement of the wound. It did not cause trauma and was less painful for the patient compared to previous attempts to remove any debris. Debridement was achieved in just 2 minutes without trauma to the wound or patient discomfort.

**Five minutes with Debbie**

**Q.** Why did you decide to start using Debrisoft?

**A.** I was intrigued by the company’s claims and had one to use. The same day I saw a patient who had had prolonged silver use and had a black leg with sloughy wounds. As the leg was washed using Debrisoft it was transformed to a healthy pink leg with a granulating wound that had epithelium around the edges.

**Q.** How does Debrisoft compare to other debridement techniques you have used? Does Debrisoft work?

**A.** It is so simple to use. The results are very quick and there is little trauma to the wound. I think the patients are a little nervous at first but since they see the results quickly with little pain they are pleased with the outcome as well.

**Q.** How easy is it to use Debrisoft?

**A.** It’s very easy. The nurses were initially concerned about wiping the Debrisoft over the wound but as they became used to it and saw the granulation tissue appearing so quickly without causing pain or bleeding, they became more confident using it and it was even more effective.

**Q.** Did your patients comment on the product?

**A.** They were very pleased with the results and that it didn’t cause any pain while being used, and were a little disappointed that it would probably only need using once or twice!

**Q.** Would you recommend it to other practitioners?

**A.** Yes! When used appropriately it was very effective on slough, thick exudate and hyperkeratosis.

‘The patients were a little disappointed that it would probably only need using once or twice!’
Case study 2: Mrs V

Background
Mrs V is an 81-year-old female with type 2 diabetes. She is house bound with poor mobility and has nephropathy, neuropathy and iron-deficiency anaemia. She presented with a right lateral mid-foot ulceration which started in November 2010. The suspected cause was pressure while Mrs V was in bed.

Treatment
The wound size was approximately 10 × 15 mm, shallow – moderate depth, predominantly sloughy base with some granulation tissue and moderate exudate levels of low viscosity. The treatment plan focused on autolytic debridement at this stage, using hydrogel. This changed to antimicrobial with antibiotic therapy when the ulcer deteriorated and with evidence of localised infection. Sharp debridement and pressure relief were used as appropriate. Larval therapy was considered but rejected because of the continued pressure issues at the site.

During the Christmas period the infection worsened and Mrs V was admitted for intravenous antibiotics. During her admission she had surgical debridement of the wound bed. During the admission a second ulceration had occurred on the plantar aspect of mid-foot, around the arch profile (Figure 3). Mrs V was discharged from hospital in February 2011.

This secondary ulcer was approximately 45 × 10 mm, moderate to deep, no bone was palpable but there was tendon evident. The wound base was predominantly sloughy, with moderate to high exudate levels. There was no cellulitis evident. The primary ulcer remained unchanged.

The objective of the treatment plan was to clean the wound bed and promote healing. Sharp debridement was not an option, because of the tendon issues.

Figure 3. Ulceration on right plantar mid-foot arch, pre-debridement

Figure 4. Ulceration on right plantar mid-foot arch, post-Debrisoft, approximately 3 minutes of use

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Patient Biography
81-year-old female, poor mobility, house bound

Medical History
Type 2 diabetes, Nephropathy, Neuropathy, Iron-deficiency anaemia
exposure; therefore Debrisoft was chosen to remove the non-adherent/light slough and clean the wound.

After use, the edge of the plantar wound was clearly defined and more granulation tissue evident. Although some slough remained it was more prominent and could be treated clinically with forceps and a scalpel. The tendon remained intact (Figure 4).

There was a marked improvement of the lateral foot ulcer evidenced by increased vascularity (Figure 5).

One week later both wounds had improved. Debrisoft was no longer required on the lateral mid-foot wound, as it had remained clean. The plantar foot ulcer had developed some slough which required further use of Debrisoft. Subsequently this improved the wound bed to an appropriate level. There were no adverse effects evident.

Between November and February the wounds continued to deteriorate. However, in February to June, following the use of Debrisoft, the lateral foot wound has healed completely. The plantar foot ulcer has continued to improve and now only a small superficial wound is evident (Figure 6 and Figure 7).

**Conclusion**

As advanced podiatrists with proficient levels of wound care, we see many ulcers that remain challenging. Debrisoft facilitates wound cleansing without compromising key features that would be a concern with sharp debridement, such as damage of underlying structures, pain and ischaemia. It also offers an advantage in time and application when compared to autolysis or larval therapy.

This patient has some hyper-sensitivity but when using Debrisoft Mrs V did not demonstrate any discomfort.

We have been pleasantly surprised at how quickly these ulcers have healed. One important difference in the management of these wounds was the ability to clean the wound bed and optimise the normal healing process, for which we believe Debrisoft may have played a key role.
Five minutes with Andrew and Michael

Q. Why did you decide to start using Debrisoft?

A. After meeting with the reps from Activa and reading the literature it was felt that Debrisoft would offer a viable alternative or an adjunct for those patients who were not able to receive sharp debridement, where autolytic debridement was taking too long to work or not working appropriately, and referral for surgical debridement was not indicated.

Q. How does Debrisoft compare to other debridement techniques you have used? Does Debrisoft work?

A. Debrisoft compares well to other debridement techniques. As with any management planning, the elective use of Debrisoft will be optimised by ensuring the appropriate choice of wound. Dry necrotic or heavily sloughy wounds aren’t appropriate but it was found to work well on lightly sloughy wounds and wounds that have foreign matter in and around them. We have used it with success for wound bed preparation prior to further debridement.

This is not to say that it replaces all other debridement techniques, but it complements those currently used, especially debridement itself.

Q. How easy is it to use Debrisoft?

A. Debrisoft is easy to use and it’s easier than saline and gauze aseptic techniques.

Q. Did your patients comment on the product?

A. It was found that apprehensive patients with painful ischaemic foot ulcers or amputation sites were the most surprised at how relatively painless the treatment was. Others found it pain free but didn’t necessarily comment as they were not expecting pain.

Q. Would you recommend it to other practitioners?

A. Yes, we already have done. Debrisoft has helped in a number of cases with different types of wounds; most commonly we are dealing with ischaemic and neuropathic ulcers and we’ve been pleased with its use. For this reason we are always happy to share good practice, especially if it benefits the patients.

‘We have used it with success for wound bed preparation prior to further debridement’
Case study 3: Mrs K

Background
Mrs K is a 92-year-old West Indian lady living in a nursing home. She was referred to podiatry with a pressure ulcer on the posterior aspect of her left heel. Her medical history includes being a type 2 diabetic for 27 years, knee pain and is registered blind.

Treatment
The wound on referral to the podiatry service (June 2011) had macerated wound edges and the base was 80% thick yellow slough. The wound had been present for 4 months prior. The dressing was changed every 2 days with the honey dressing Activon Tulle (Advancis) and the foam dressing Tegaderm (3M) with a Tubifast (Mölndlycke) covering. The pressure on the heel is being offloaded in a foam heel protector. One more visit was made to Mrs K for sharp debridement and dressing changes with only a slight decrease in slough and size of the wound.

On the third visit it was felt that Debrisoft would be useful in this case as the wound was static. Figure 8 and Figure 9 show the wound prior to the use of Debrisoft and Figure 10 shows the wound after Debrisoft was used. Debrisoft was moistened using warmed saline and cleaned over the wound for 4 minutes. Mrs K reported no pain during the procedure although she had felt some discomfort with sharp debridement on previous visits. The wound bled slightly but was soon stopped using digital pressure. The honey and foam were then applied. The area was dressed every other day and 1-week review was carried out by the podiatrist.

One week after Debrisoft was first used Mrs K reported no pain when the dressing was removed and after Debrisoft was used. As the wound base was very vascular (bleeding on removal of the dressing) it was decided that Debrisoft would not be used at this time. The same dressing regime was continued.

Figure 11 shows the ulcer 2 weeks after Debrisoft was used. The base of the wound is much improved now with only 10% slough and a granulating base. Due to the presence of so little slough it was felt that Debrisoft was not needed at this time; the honey and foam dressing was continued. Weekly podiatry reviews will be carried out until resolution of the ulcer.

Conclusion
Even though the wound is not resolved, I think Debrisoft has made a significant improvement in the wound base of the ulcer and will ultimately increase the speed with which the ulcer heals. More importantly, it provided a fast and easy-to-use debridement of the wound on an area that is hard to reach, especially in a home visit environment where it is much harder to elevate the limb.
Q. Why did you decide to start using Debrisoft?

A. I decided to use it on Mrs K as the slough is very thick and glue-like. Because of the location of the wound and Mrs K’s age it was difficult to elevate it to a desired height to debride it. Prior to using Debrisoft I was lying on the floor to look up to debride the area. Also, following two episodes of sharp debridement, the wound was progressing slowly. I wanted to see if Debrisoft could kickstart the healing process.

Q. How does Debrisoft compare to other debridement techniques you have used? Does Debrisoft work?

A. Having 17 years experience I have used four other techniques of debridement:
  - Varidase injected into the area: this was a poor technique and any improvement we did see was often very slow
  - Larval therapy: this is very effective; however, it needs coordination and lots of explaining to the patient and getting them over the ‘yuk’ factor
  - Dressings: various ones to hydrate slough and speed up autolysis. Dressings do work but it is a slow process which can sometimes over-hydrate a wound

Q. How easy is it to use Debrisoft?

A. The use of Debrisoft could not be easier; wet it and then rub it over the wound. The debrided fluid and skin is then locked up in the product and it does not leak.

Q. Did your patients comment on the product?

A. My patient said they didn’t feel anything when using Debrisoft even though they had experienced some discomfort with sharp debridement.

Q. Would you recommend it to other practitioners?

A. I would have no hesitation to recommend this to other practitioners. It is a very useful addition to wound care but it still needs to be used in collaboration with the other aspects of wound healing; suitable dressings, suitable footwear, offloading of pressure, and nutrition.

‘Debrisoft offers a fast, easy-to-use technique with no specialist training required’
Case study 4: Mr J

Background
Mr J is a 48-year-old male with x-linked hypophosphatemic rickets affecting both lower limbs, bilateral full leg chronic lymphoedema (stage 3), obesity (BMI = 55.26), arthritis, bilateral hearing aids and hypertension. Mr J presented with marked bilateral hyperkeratosis in the gaiter region, skin nodules, discoloration, fungal infection between the toes, bilateral skin folds around the distal gaiter region and bilateral positive Stemmer's sign (Figure 12). Both legs presented with fibrosed subcutaneous tissue which was distorted in shape and had a limb volume 40% greater than normal. There was no wound on assessment.

Treatment
No previous treatment was given at this clinic, but Mr J was treated at another centre with long-stretch bandages which he was unable to tolerate.

The objectives of the treatments were to de-bulk tissue volume, reverse skin changes and reduce the amount of hyperkeratosis, eradicate the toe fungal infection, educate Mr J on skin care and self-management and ultimately reduce the number of cellulitis attacks, reducing hospital admission.

Debrisoft was used once on each leg for a duration of 10 minutes at the beginning of a 2-week intensive therapy course for lymphoedema management using LymphAssist (Haddenham Healthcare) and multi-layer lymphoedema bandaging (Actico (Activa) cohesive short stretch bandage).

I saw spectacular results within 10 minutes of using Debrisoft – all hyperkeratosis was diminished, the patient described a comfortable feeling and relief from his normal ‘itching’ (Figure 13). As the results were so good Debrisoft did not need repeating, therefore just general showering of limbs on every bandage re-application was needed, using a lanolin-free ointment, cutting down therapy time. There were no adverse effects.

Figure 12. Mr J on presentation, before use of Debrisoft and intensive lymphoedema therapy

Figure 13. During Debrisoft treatment (left leg only due to mobility)
Conclusion

Mr J and his relative were very impressed with the first treatment which had a dramatic effect on the results of the overall lymphoedema management treatment block. Compression garments were tolerated for the first time as the skin was not itching and uncomfortable. Mr J is now willing to try to self-manage.

I first approached the product with scepticism, I thought it looked like a car buffer polish cloth! Although it felt very soft I found it hard to believe it would do a better job than an ordinary face cloth when used for the same amount of time. The difference when I used it was obvious; a face cloth, when used vigorously for a length of time, could cause skin damage therefore not achieving the desired results, but the Debrisoft achieved a better-than-expected outcome in a shorter time period, i.e. the first day of intensive treatment rather than after several sessions.

In terms of chronic oedema management, the product is probably of most benefit when the skin is indurated with hyperkeratosis and hard dry plaques of skin. The results were excellent as they achieved the desired results in 10 minutes rather than 2 weeks of bandaging. The 2 weeks of bandaging is still necessary with this group of patients to reduce the tissue volume and also reverse other skin changes, gain shape and stimulate the lymphatic system. However, Debrisoft cut down therapy time at each session by about 10 minutes and reduced the need to prescribe other lotions and ointments to do this job over time.

Five minutes with Justine

Q. Why did you decide to start using Debrisoft?
A. Through discussion with the company whose bandages I use about expediting some areas of care and treatment.

Q. How does Debrisoft compare to other debridement techniques you have used? Does Debrisoft work?
A. When managing chronic oedema we very rarely have the need to debride as we do not often have wound challenges; however, when managing hyperkeratosis removal this is often achieved over a long period of time through a strict skin hygiene regimen and bandaging. Having the ability to expedite this, i.e. in 10 minutes, is revolutionary.

Q. Did your patients comment on the product?
A. Yes in that it felt very ‘relieving’ of the constant itching of the skin in that area.

Q. Would you recommend it to other practitioners?
A. Yes, when faced with specific types of skin condition as aforementioned.

‘Using Debrisoft is exceptionally easy’
Case study 5: Mrs W

Figure 14. Before Debrisoft was used

Figure 15. After Debrisoft was used

Background
Mrs W is a 76-year-old lady with bilateral leg lymphoedema secondary to lymphostasis and recurrent cellulitis which had previously required hospital admission to treat. She has chronic kidney disease stage 3, hypertension, ischeamic heart disease and diabetes. On examination there were large areas of long-standing hyperkeratosis covering the patient’s feet and lower legs. The patient states her swelling began in 2006. On examination the patient’s skin was intact, but at high risk of infection owing to dry, scaly areas which are prone to cracks and breaks where infection could enter.

Treatment
Previously, Mrs W’s hyperkeratosis was treated with greasy emollients to soften and rehydrate the affected area. The aim of using Debrisoft was to quickly debride the hyperkeratosis, to reveal healthy skin beneath, which could be softened, rehydrated and maintained with emollients.

Just one treatment with Debrisoft was required to gain the desired effect. The hyperkeratosis lifted easily with gentle circular motions and very light pressure applied. The patient was comfortable throughout. There was no trauma caused to the healthy skin below and there were no adverse effects. The treatment time took approximately 12 minutes in total to remove the established hyperkeratosis from one foot. Debrisoft was very easy to use with warm tap water. A second treatment was not required. Mrs. W was surprised at how quick the treatment was, and she was very pleased with the outcome.

Conclusion
I found Debrisoft very effective, and although I thought initially at least two treatments would be needed, in practice just one treatment was adequate. I had previously used Debrisoft on another patient with hyperkeratosis where two treatments were required.

I was particularly pleased with the outcome following the use of Debrisoft. In lymphoedema, skin care is vital to keep tissues soft to aid drainage of the lymphatics and skin intact to reduce the risk of infection. Patients with lymphoedema are particularly prone to developing cellulitis. Each episode of cellulitis a patient experiences causes their lymphoedema to worsen. I will certainly use Debrisoft for my patients in the future.

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Patient Biography
76-year-old female

Medical History
Chronic kidney disease
Ischeamic heart disease
Diabetes
Five minutes with Jan

Q. Why did you decide to start using Debrisoft?

A. I was shown a sample of Debrisoft by my Activa lymphoedema representative. She explained its use and the intended benefits.

Q. How does Debrisoft compare to other debridement techniques you have used? Does Debrisoft work?

A. I tend to see established hyperkeratosis in patients with long-standing lymphoedema who have not had access to a lymphoedema specialist.

Before I was introduced to Debrisoft, treatments to remove hyperkeratosis were limited, usually using greasy emollients as a soap substitute with gauze in warm water and moisturiser to rehydrate and soften the areas. This process was slow and not particularly effective. I decided to evaluate its use in the debridement of hyperkeratosis.

Q. How easy is it to use Debrisoft?

A. Debrisoft is easy to use and provides fast, effective results. Lymphoedema outcomes can be improved through simple skin care strategies. Patients are encouraged and motivated when they see such good outcomes in such a short time.

Q. Did your patients comment on the product?

A. The two patients that I have used Debrisoft on both found the treatment comfortable and were amazed and pleased with the results.

Q. Would you recommend it to other practitioners?

A. I would recommend Debrisoft to other lymphoedema practitioners, and also to tissue viability nurses as patients with leg ulcers are also prone to developing hyperkeratosis.

’I would recommend Debrisoft to other lymphoedema practitioners, and also to tissue viability nurses’