USING CUTIMED[®] SORBACT[®] Hydroactive on chronic infected wounds

The ineffective management of chronic wounds can lead to psychological stress for the patient and is costly for healthcare services. For the evaluation, the author assesses the effectiveness of Cutimed[®] Sorbact[®] Hydroactive dressings in managing symptoms associated with chronic wounds with minimal trauma to the wound bed. The author also looks at the dressing's ease of application and removal.

linicians who care for patients with chronic wounds are faced with the challenge of ensuring they understand how different dressings can be used to manage infection and exudate with minimal trauma to the wound bed.

Posnett and Franks (2008) stated that a high percentage of chronic wounds remain unhealed for long periods unnecessarily. Such ineffective management can result in increased psychological stress and anxiety for all involved and can create a considerable financial burden for healthcare services.

The management of wounds should focus on identifying problems early on and using appropriate strategies and interventions to facilitate healing and avoid complications (World Union of Wound Healing Societies [WUWHS], 2007). The challenge for clinicians is, therefore, to recognise and take appropriate measures to simplify the complexity of the wound so it can heal in the shortest time without negatively impacting on the patient's quality of life (Moffatt, 2004).

There are several national guidelines and frameworks in place dealing with wound management, produced by the Department of Health. These include:

NHS National Service FrameworksNational Institute of Health and

Clinical Excellence guidance (NICE, 2003; 2008; 2011)

 Scottish Intercollegiate Guidelines Network (SIGN, 2010).

Nevertheless, for some wound types these frameworks do not always give clinicians clear expectations in relation to the necessary standards of knowledge, and how to assess and treat (Wounds UK, 2008).

Clinicians may need to look for alternative treatment strategies and, in some circumstances, the goal of treatment may change from healing to effective symptom control to ensure the patient has the best possible quality of life (Fletcher, 2007). However, access to some wound therapies is restricted depending on where patients live and which clinician is caring for them (Gray, 2005).

The professional clinician needs to address the needs of the patient to carry out therapeutic strategies in a timely and cost-effective way, such as:

- ▶ Poor nutrition
- ► Illness
- Patient-related physical factors, including co-morbidity; allergy; medication; psychosocial state; pain; concordance
- Wound-related factors, including duration; size of area and depth; ischaemia; inflammation; infection; anatomical site; wound bed condition and treatment response.

'As the dressings do not donate any chemicals into the wound, they can be safely used for longer than the two-week period advocated for conventional antimicrobials'

KEY WORDS

Antimicrobial Cutimed[®] Sorbact[®] Hydroactive Infection management Exudate management Pain relief Safety

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KEY POINTS

- Clinicians should aim to take appropriate measures to simplify the complexity of the wound so it can heal in the shortest time without negatively affecting quality of life.
- As the dressings do not donate any chemicals into the wound, they can be safely used for longer than the twoweek period advocated for conventional antimicrobial dressings.



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Figure 1: A Cutimed[®] Sorbact[®] Hydroactive dressing.

A dressing that can effectively manage the symptoms associated with chronic wounds — such as infection, exudate and pain — with minimal trauma to the wound bed could, therefore, be useful to clinicians.

AIMS

The main aim of this evaluation was to determine the efficacy of Cutimed[®] Sorbact[®] Hydroactive dressings to reduce signs of infection, manage exudate and promote wound healing in a variety of chronic wounds. This was measured by assessing the reduction in:

- ▶ Erythema
- ▶ Heat
- ▶ Oedema
- 🕨 Pain
- ▶ Odour
- Exudate

 Increased presence of granulation and epithelial tissue.

A secondary aim was to assess the dressings' performance in terms of ease of application and removal, and pain levels during and between dressing changes.

MODE OF ACTION

Cutimed Sorbact Hydroactive, part of the Cutimed Sorbact range of antimicrobial dressings, represents an important paradigm shift in antimicrobial management (Butcher, 2011). The dressings are coated in dialkylcarbamoyl chloride (DACC), a hydrophobic fatty acid, which has the ability to reduce the microbial load in a wound without using a chemically active agent (Ljungh, 2006).

Table 1

Dressing properties of Cutimed® Sorbact® Hydroactive

In the presence of moisture, bacteria are irreversibly bound to the dressings, providing effective antimicrobial control combined with a low risk if bacterial spread at dressing change. There is no upper binding capacity

There are no contraindications and the dressing can be used safely during pregnancy, breastfeeding and on children

The dressing binds bacterial toxins reducing damage to the wound bed

No development of microbial resistance

No risk of allergies or systemic absorption (Denyer, 2009), so suitable for all patients with sensitivities or who are unable to tolerate other antimicrobial agents

As no chemicals are released into the wound bed, treatment can continue for extended periods of time compared to traditional topical antimicrobials

Cutimed® Sorbact®

Due to a unique physical process called hydrophobic interaction, when the dressings come into contact with moisture they irreversibly bind pathogenic bacteria and fungi present in infected wounds to the dressing fibres. These include:

- ✤ Staphylococcus aureus
- Methicillin-resistant Staphylococcus aureus (MRSA)
- >> Pseudomonas aeruginosa
- Enterococcus faecalis
- >> Candida albicans.

Once bound to the dressing, bacteria and fungi are rendered inert and are prevented from proliferating or releasing harmful exotoxins and endotoxins (Hardy, 2010). At each dressing change, micro-organisms are, therefore, removed from the wound bed along with the dressing, thereby constantly reducing the microbial load.

As there is no release of chemicals onto the wound bed, the dressings can be used safely on all patients regardless of age and underlying medical conditions (Haycocks and Chadwick, 2011). The dressings can also be used prophylatically on wounds at risk of infection (Derbyshire, 2010).

The properties and benefits of these dressings are highlighted in *Table 1*.

CUTIMED SORBACT HYDROACTIVE DRESSINGS

The range comprises a Cutimed Sorbact wound contact layer combined with an absorbent, actively responsive hydropolymer matrix.

The dressings are comprised of three layers as illustrated in *Figure 1*. Layer 1 is a Cutimed Sorbact wound contact layer which provides the dressings with effective antimicrobial properties.

Layer 2 is an absorbent hydropolymer gel matrix which vertically absorbs and locks-in wound exudate. This layer also helps to maintain a moist wound bed by donating moisture as required to drier wounds.

Layer 3 is a semi-permeable polyurethane film which is permeable to water vapour and provides the dressings with a bacterial barrier.



Wound bacteria and fungi Staph. aureus (yellow), Pseudomonas (purple) and Klebsiella (green) bound to Cutimed Sorbact. (Magnification x4000)

DACC antimicrobial dressings

Safe'. Innovative. No contra-indications^{*}.

CUTIMED SORBACT is the only range of dressings coated with DACC that can reduce the microbial load. In a moist environment, bacteria and fungi will bind to the dressing helping to kick start the healing process.^{3,4}

To strengthen your formulary in line with the growing list of Cutimed Sorbact users across the UK, contact us at:

www.cutimed.com or advancedwoundcare.uk@bsnmedical.com

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Figure 2: Progression towards healing.

INDICATIONS

The dressings are indicated for shallow, contaminated, colonised or infected wounds with low-to-moderate exudate levels including:

- ▶ Arterial, venous, pressure and diabetic foot ulcers
- Post-operative, dehisced wounds •
- Traumatic wounds.

This article will now describe the findings of an evaluation of Cutimed Sorbact Hydroactive dressings (Table 2) carried out on 13 patients with several different types of wounds.

METHODOLOGY

This was a multi-centre study conducted during 2010/2011. Six centres across the UK and Ireland participated in the evaluation. The following four were community based:

- ▶ Barnsley PCT, South Yorkshire
- Bristol PCT

Table 2

Dressing size

7 x 8.5cm

14 x 14cm

19 x 19cm

24 x 24cm

14 x 24cm

- >> St Charles' Centre for Health and Wellbeing, London
- >> Feidhmeannacht na Seirbhíse Sláinte (Health Service Executive), Dublin.

Cutimed[®] Sorbact[®] Hydroactive Range

The following two centres were acute hospitals:

- ▶ University Hospital South Manchester Royal Victoria Infirmary, Newcastle. •

All clinicians involved in the study were briefed on the correct use of Cutimed Sorbact Hydroactive dressings and data was collected using a standard set of evaluation forms. Reduction in the level of bioburden was determined by subjectively assessing the following parameters that indicate the presence of infection at each dressing change:

- ▶ Erythema
- Heat •
- Oedema
- Pain •

Wound pad

5 x 6cm

10 x 10cm

15 x 15cm

20 x 20cm

10 x 20cm

- Odour •
- ▶ Level of exudate
- ▶ Increase in the amount of granulation and epithelial tissue.

Clinicians were encouraged to use the dressings for a 28-day period or until signs of infection had reduced. As the dressings do not donate any chemicals into the wound, they can be safely used for longer than the two-week period advocated for conventional antimicrobials (Wounds UK, 2010). If signs of infection diminished before 28 days, use of the dressings stopped. On average, the dressings were

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applied for a period of eight weeks, the period ranging from two to 12 weeks.

Dressings were changed as necessary but were kept on for no more than four days. Clinicians were able to choose the most appropriate fixation for the dressing including retention, tubular and compression bandages.

PATIENT AND WOUND PROFILE

Out of 13 patients included in the study, seven were male and six were female. There were 14 wounds assessed in total. The mean age was 70 years, ranging from 52–87 years. All wounds, apart from one, were deemed to be chronic — defined as a wound which has remained unhealed for longer than six weeks (Cutting and Tong, 2003).

Prior to treatment with Cutimed Sorbact Hydroactive, the average wound age was 12 months, ranging from two weeks to 33 months. All patients provided their consent.

Cutimed Sorbact Hydroactive dressings were used on wounds with varying aetiologies. These included:

- ▶ Venous leg ulcers (n=9)
- ▶ Traumatic wounds (n=4)
- ▶ Mixed arterial ulcer (n=1).

For those patients with venous leg ulcers, compression therapy was applied. All patients were assessed for other risk factors which may also delay wound healing (see *Table 3*).

RESULTS

Progression towards healing

Over the course of the evaluation there was a decrease in the number of wounds with signs of inflammation (79% at the start of treatment reducing to 29%).

The number of wounds with granulation tissue also increased, as did the epithelial

Table 3 Risk factors that can delay wound healing			
Risk factor	Yes	No	
Smoking	3	10	
Alcohol	4	9	
Obesity	1	12	
Diabetes	4	9	
Hypertension	8	5	
Circulatory disorders	7	6	
Allergies that may affect wound healing	0	13	
Cancer	0	13	

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tissue — from three to eight wounds. (*Figure 2*). As 13 out of 14 wounds were considered chronic at the start of treatment this demonstrated the effectiveness of the dressings in kick-starting healing. This phenomenon was also documented by Hampton (2007).

Infection management

At the start of the evaluation, 100% of the wounds showed signs of infection. At the end of treatment only two wounds (14%) were still classed as infected. These patients received the shortest treatment periods with Cutimed Sorbact Hydroactive, lasting two weeks and four weeks, respectively, compared with the mean period of eight weeks. Nevertheless, some signs of infection — erythema, heat, pain and odour — had reduced during this period (see *Figure 3*).

For all other wounds, erythema and heat were eliminated. There was also a reduction in oedema (88%; n=7), pain (83%; n=10), odour (73%; n=8) and exudate levels (29%; n=4).

Reduction in wound size

The progression towards wound healing was also supported by a reduction in the size of 79% (n=11) of the wounds. There was a 75% reduction in size in 43% (n=6) of wounds during the evaluation





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Figure 6: Peri-wound skin status before and after treatment.

period, with a further 7% (n=1) reducing between 25–49%.

Exudate management

High levels of exudate are associated with infected wounds. At the start of treatment, 93% (n=13) of wounds had 'copious' or 'moderate' levels of exudate (see *Figure 4*). This reduced to 36% (n=5) by the end of the study with 29% (n=4) having no exudate.

One hundred per cent of clinicians found the dressings to have an 'acceptable' speed of absorption, with 93% 'happy' with the absorption capacity of the dressings. Sixty nine per cent also felt it was easy to visibly detect when the dressings were saturated and required changing with the average dressing change taking place every two to three days.

Pain

Pain was measured subjectively, with 11 patients experiencing pain at the start of the evaluation, decreasing to two (18%) patients presenting with pain at the end. Clinicians commented that the hydropolymer gel sheet was cooling and provided some pain relief for most patients.

ODOUR

All wounds had some level of odour at the start of the treatment with 86% (n=12) either 'significantly' or 'moderately' malodorous (see *Figure 5*). At the end of treatment 79% (n=11) had either 'light' or 'no' odour. Clinicians commented on the ability to control odour between dressing changes.

Peri-wound skin

Only two of the 14 wounds had healthy peri-wound skin at the start of treatment with the most common problems being maceration and redness (*Figure 6*). Over the course of the evaluation the number of wounds with healthy skin increased from two to seven due to the ability of the dressing to vertically absorb and lock-in wound exudate.

Patient and clinicians assessment

One hundred per cent of clinicians found the dressings easy to apply and either 'very good' (31%; n=4) or 'good' (69%; n=9) for ease of removal. The pain associated with the application and removal of the dressing was subjectively assessed, with 92% (n=12) of patients not experiencing any pain while the dressing was being applied and 15% (n=2) stating 'bearable' pain while it was being removed.

Patients who were also receiving compression therapy were asked to rate the comfort of the dressings under compression. This was rated as a score from one to 10 with one meaning 'not satisfied' and 10 meaning 'satisfied'.

The mean patient score was nine ranging from six to 10. Overall, the clinicians rated the dressings either 'very good' (62%; n=8) or 'good' (38%; n=5).



Figure 7: At first review, this venous leg ulcer wound measured 6.5 x 5cm and had high exudate levels.



Figure 8: After 28 days the wound had reduced in size to 5 x 3cm and exudate levels had decreased.



Figure 9 After 63 days exudate levels were slight and the patient experienced no pain when dressings were changed.



Figure 10: After 14 weeks of treatment the wound was nearly healed.



Figure 11: At first review, the wounds were covered in 50% slough.

CASE STUDIES

Case 1: Treatment of a venous leg ulcer in an intravenous drug user

MR is a 37-year-old male with a history of IV drug abuse, alcohol abuse, pulmonary embolism, septicaemia and phlebitis. Upon presentation (*Figure 7*) he had a wound of six months' duration measuring 6.5 x 5cm and with high exudate levels. Fifty per cent of the wound bed was covered in slough and the patient was experiencing high levels of pain.

Cutimed Sorbact Hydroactive dressing and compression therapy was initiated and changed twice a week. To aid healing, a nutritional supplement drink was introduced.

The wound had reduced in size 28 days later (*Figure 8*) and measured 5 x 3cm with 100% of the wound bed covered in granulation



Figure 12: After 39 days the Cutimed

dressings were discontinued.

By day 63 (*Figure 9*) the wound had further reduced in size and now measured 4 x 3cm. Eighty per cent of the wound bed was covered with epithelial tissue; exudate levels were slight and no pain was experienced. During this period, the dressings were changed twice per week. After 14 weeks (*Figure 10*) the wound was nearly healed.

Case 2: Treatment of a leg ulcer as a result of a trauma injury

NO is a 79-year-old, wheelchair-bound male who developed two wounds after knocking his leg on his chair. He had previously suffered a cerebrovascular accident. The wounds had previously been treated with silver hydrofiber dressings, foams, iodine based dressings and hydrogels. The initial measurements were 2.5 x 2.5cm (a) and 2.75



Figure 14: Infection was eliminated after one month of treatment.



Figure 15 This venous leg ulcer wound had been present for 26 months.



Figure 16 By the end of the evaluation the wound had reduced in size and there were no signs of infection.



Figure 13: This patient presented with a chronic lymphovenous leg ulceration.



Figure 17: This arterial ulcer followed a failed iliac artery stent insertion.



Figure 18: Following six weeks' use of Cutimed Sorbact Hydroactive the wound was no longer infected.

x 3cm (b). Both wounds were 50% covered with slough and the surrounding skin was macerated (*Figure 11*). Cutimed Sorbact Hydroactive was applied to the wounds, changed three times per week and held in place with Tubifast[®] (Mölnlycke). After 39 days (*Figure 12*) both wounds had reduced in size. They measured 1 x 1cm (a) and 0.5 x 05cm (b) and had no exudate. Wound a was now 100% covered in granulation tissue. At this point, the use of Cutimed Sorbact Hydroactive was discontinued as the signs of infection had reduced.

Case 3: Chronic lymphovenous leg ulceration

DJ is a 52-year-old female with type 2 diabetes who presented with a chronic lymphovenous leg ulceration of 12 months' duration (*Figure 13*). Initially, the wound measured 11 x 12cm and showed several signs of infection, including erythema, heat, oedema, pain and odour. The wound bed was covered in 75% slough and exudate levels were high.

This patient was allergic to other forms of topical antimicrobials, such as silver, honey and iodine. Cutimed Sorbact Hydroactive dressings were applied as an alternative topical antimicrobial, in conjunction with made-to-measure compression hosiery. Dressings were changed on average every two to three days during an eight-week period.

After one month (*Figure 14*), signs of infection had been eliminated. Exudate levels had reduced with the wound reducing 20% in size to 11 x 9.5cm. Slough was still present on the wound bed but now only on 50% of it. The clinician found the dressing easy to apply with an overall assessment of 'good' The patient appeared happy as this was the first time in a year that she had not experienced pain when having her dressing changed.

The patient also reported the dressings were comfortable under the compression hosiery. Even though the wound was infection-free, the dressings were used for a further month due to the pain relief experienced by the patient and the healing encouraged by the dressings.

Case 4: Treatment of a venous leg ulcer SF is a 78-year-old female who has suffered from obesity and circulatory disorders. Present for 26 months, her ulcer measured 4.4 x 2.5cm upon assessment, was painful and had signs of infection (erythema, odour) (*Figure 15*). There were moderate levels of exudate, some odour and macerated periwound edges. Slough covered 20% of the wound bed in addition to some granulation and epithelial tissue.

A range of dressings had previously been used including silver and iodine dressings with limited results.

Cutimed Sorbact Hydroactive dressings were applied in conjunction with compression bandages and changed every two to three days.

By the end of the evaluation the wound had reduced to 3.2 x 3.4cm with no signs of infection (*Figure 16*). Exudate levels remained moderate but, since the level of bioburden had been reduced — which is the primary aim of Cutimed Sorbact Hydroactive dressings and not achieved with other antimicrobial dressings in this case — it was appropriate to switch to a dressing with exudate management properties only.

The patient found the dressings to be moderately comfortable under compression bandages with bearable levels of pain at dressing change. Overall, the clinician found the dressings to have good infection and exudate management properties with an overall assessment of 'very good'.

Case 5: Traumatic wound following attempted iliac stenting

Patient SMW is a 66-year-old female who developed an arterial ulcer following a failed iliac artery stent insertion (*Figure* 17). The patient is a diabetic and also has hypertension and circulatory disease.

The wound had been present for two years, previously being treated with Aquacel[®] (ConvaTec), Versiva[®] (ConvaTec) and alpinate honey. It measured 8.x 4.5cm and showed signs of infection, including erythema, heat, oedema and pain.

There were also high levels of exudate and a significant odour. The peri-wound skin was macerated.

Cutimed Sorbact Hydroactive was applied to the wound and held in place with a

retention bandage. The dressings were changed every two to three days.

Signs of infection were no longer present after 28 days and there was a reduction in the amount of odour. Exudate levels remained high, however, and the periwound skin was still macerated.

The patient found the dressings to be comfortable and experienced no pain during or between dressing changes. Cutimed Sorbact was continued for a further three weeks, with the wound virtually healed at the end of this period (*Figure 18*).

DISCUSSION

Since this was a simple case series evaluation no firm conclusions can be drawn. That said, similar results were seen from six separate centres.

The initial results show Cutimed Sorbact Hydroactive dressings had a positive impact on infection and exudate reduction. In addition, patient feedback indicates that the dressings can provide pain relief.

As an overview, the use of Cutimed Sorbact Hydroactive dressings demonstrated:

- ➤ A 50% reduction in signs of inflammation
- ➤ An 86% reduction in the number of wounds displaying two or more signs of infection
- ➤ A reduction in the level of exudate in 71% of wounds
- One hundred per cent of clinicians stated the dressing had an acceptable speed of absorption with 93% happy with the capacity
- ➤ Of the patients experiencing pain at the start of the evaluation, 83% were pain-free at the end
- Odour levels reduced in all patients
- ✤ Over the course of the treatment, 86% of wounds reduced in size.

CONCLUSION

This evaluation has shown Cutimed Sorbact Hydroactive to be effective in the management of infection in a variety of chronic wounds. In addition, patient feedback has indicated the dressings can provide pain relief, thus improving quality of life. Due to the DACC coating, the dressings are unique in so far as they can safely provide infection management without donating chemicals to the wound bed.

This is an opportunity to incorporate a new method of bacterial control, which has proven to be safe, efficient and cost-effective, even for long periods.

Cutimed Sorbact Hydroactive has provided benefits to both patients and clinicians by offering an alternative dressing to manage bacterial burden within the wound bed.

Moffatt and Vowden (2008) suggest that the healing process is a result of a complex interaction between patient and wound-related factors, the treatment used and the knowledge of healthcare professionals.

Not addressing these issues will result in escalating cost and a failure to meet government targets and will risk demoralising staff and patients. Every patient has a right to high-quality care, where possible, to achieve wound healing.

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