

Chronic oedema and associated complications

Chronic oedema is classified as a swelling that does not respond to elevation or diuretics and which has been present for three months or more. Managing chronic oedema complicated with ulceration, lymphorrhoea or infection can prove a challenge. Moreover, it is costly to the health service in terms of time, resources and staffing, and has an impact on patient quality of life. However, with appropriate management strategies, these factors can be reduced. The case reports in this paper demonstrate oedema reduction techniques alongside Cutimed® Sorbact® swabs and pads, Cutimed® Siltec and Cutisorb® Ultra dressings (BSN medical).

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KEY WORDS

Cutimed® Sorbact®
Cutimed® Siltec
Cutisorb® Ultra
Chronic oedema
Quality of life

The World Health Organization document (WHO, 2010), *Wound and Lymphoedema Management*, stresses the need to integrate lymphoedema, chronic oedema and wound care (Bolton, 2010). Due to skin changes that occur in patients with chronic oedema, there is the potential for venous ulceration to occur (Hampton, 2010). Thus, dressings are required to manage infection and exudate. Conditions such as lymphorrhoea also require dressings that have good absorbent capacity.

Cutimed® Sorbact® for topical antimicrobial management and Cutimed® Siltec and Cutisorb® Ultra dressings for exudate/fluid management from BSN medical can help to manage such conditions in conjunction with appropriate decongestive lymphatic therapy (DLT).

Cutimed Sorbact wound dressings represent a shift in topical infection management and have no chemically active agent (Derbyshire, 2010). The dressings use the principle of hydrophobic interaction to irreversibly bind pathogenic bacteria and fungi present in infected wounds to the dressing without a chemically active agent (Ljungh et al, 2006). The dressings are coated with dialkylcarbamoylechloride

(DACC), a natural fatty acid derivative that gives the dressings hydrophobic properties (Skinner and Hampton, 2010). In a moist environment and with direct contact to the wound bed, pathogens such as *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella* and *Candida albicans*, (which also display hydrophobic properties), are attracted to the surface of the dressings (Powell, 2009) and are irreversibly bound.

Once irreversibly bound to the dressings, microbes are inactivated and their metabolism slowed down. As a result, cell replication and the formation of bacterial toxins that also impair wound healing are minimised (Ljungh et al, 2006). Consequently, pathogens are 'trapped' but not killed and so there

Table 1

Cutimed Sorbact dressing properties (Ljungh et al, 2006)

- ▶▶ Bacteria are irreversibly bound to the dressings, providing effective antimicrobial control combined with a low risk of bacterial spread at dressing change
- ▶▶ No contraindications and can be used safely during pregnancy, breastfeeding and on children
- ▶▶ Binds bacterial toxins reducing damage to the wound bed
- ▶▶ No development of microbial resistance
- ▶▶ No risk of allergies, so especially suitable for all patients with sensitivities or who are unable to tolerate other antimicrobial agents

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is no endotoxin release into the wound bed, thus further improving conditions for wound healing. The benefits of such a mode of action to clinicians can be found in *Table 1*.

The Cutimed Sorbact range comprises a wound contact layer (swabs) for either packing deep wounds or lining shallow wounds, ribbon for use in cavity wounds or for wrapping around digits, round swabs for small cavity wounds, and absorbent pads. A new hydrogel sheet version, Cutimed® Sorbact® Hydroactive, is suitable for use where higher levels of exudate need to be managed. The swabs are particularly versatile as, while they are sold by their folded dressing size, they can be used unfolded (which is actually three times larger), thus making them cost-effective (Derbyshire, 2010).

Cutimed Siltec combines a gentle silicone wound contact layer with super-absorbent particles above the foam core, plus a permeable top film. This combination maintains a moist wound environment while providing fluid-handling properties, resulting in less frequent dressing changes (Norris, 2010). The addition of super-absorbers helps to lock exudate above the foam core reducing the risk of maceration (Stephen-Haynes et al, 2010), particularly under compression (Norris, 2010).

As maintaining healthy skin is a key requirement for the successful management of chronic oedema (Wingfield, 2009), the minimal risk of maceration is a key feature of the Cutimed Siltec range. Stephen-Haynes et al (2010) also found that the dressings had vertical absorption with minimal lateral spread; fluid was absorbed directly into the dressing at the point of contact, keeping the surrounding skin dry.

The silicone wound contact layer also provides further protection to fragile tissues and skin, with atraumatic and pain-free removal (Stephen-Haynes, 2010).

The range is available as non-bordered dressings (Cutimed Siltec), bordered dressings (Cutimed® Siltec B) and in a thinner version (Cutimed® Siltec L), depending upon exudate levels.

For wounds with copious levels of exudate, Cutisorb Ultra has been specifically designed. The dressing has a super-absorbent core which absorbs and retains large volumes of fluid with minimal risk of maceration or leakage. This makes the dressing suitable for the management of lymphorrhoea and very wet chronic wounds.

Cutisorb Ultra dressings have the added benefit of helping the body to modulate proteases required for wound healing (Norris, 2010).

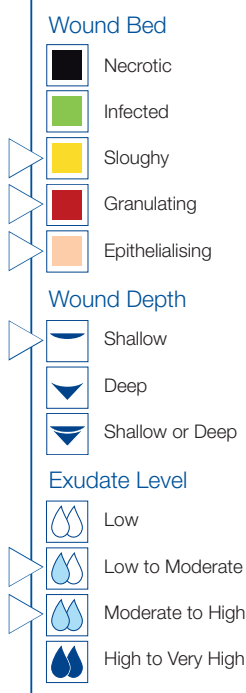
Kendal Lymphology Centre (KLC) is an independent facility set up to address the needs of patients suffering from chronic oedema or lymphoedema associated with both cancer or non-cancer related aetiologies. Many patients referred have had swelling for many months or sometimes years, and if left untreated, these patients go on to develop wet, soggy, leaking legs, providing a medium for infection.



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- Excellent exudate management²
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Further excoriation causes severe patient distress both physically and psychologically (Keeley, 2009).

Due to lack of appropriate education and training in the author's local area, the community teams struggle to effectively manage the problem and, despite introducing elevation, diuretics and bandaging with crepe or sometimes four-layer bandaging (and/or a variety of dressings and topical preparations), the oedema often regresses even further:

KLC incorporates an initial assessment to establish the underlying cause and any comorbidities which can be effectively treated (e.g. cardiac or renal insufficiency, anaemia, etc), but also to ensure that there are no underlying contraindications to treatment (Beldon, 2009). A comprehensive package of care usually incorporating three weeks of decongestive lymphatic treatment (DLT) is implemented, involving skin and general health care (including wound management as necessary with as simple a dressing as possible), multi-layer lymphoedema bandaging (MLLB), exercise, manual lymphatic drainage (MLD – a specialist form of massage), and/or intermittent pneumatic compression therapy (IPC) and Kinesio taping.

Case report one: chronic oedema with leg ulceration and lymphorrhoea

Mrs AB is a 74-year-old female who was referred to the lymphoedema clinic by her GP after the community team requested help in dealing with her right leg oedema and very large, almost circumferential, ulceration. The oedema became troublesome following a knee replacement in 2007, and, although elevation and diuretics were instigated, chronic oedema ensued. This is a common scenario after such procedures (Moffatt et al, 2003) and the author frequently sees such patients referred to clinic with longstanding (chronic) oedema following hip and knee replacements, as well as venous grafting for heart bypass operations and similar conditions. Chronic oedema can be defined as swelling which has been present for more than three months and is not relieved by elevation or diuretics



Figure 1. Mrs AB's ulcer at presentation to the author's clinic.



Figure 2. Cutimed Sorbact swabs in situ.

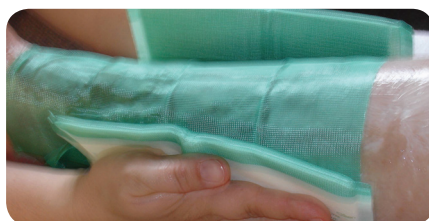


Figure 3. Dressings covered with Cutimed Sorbact pads to absorb exudate and prevent leakage through the dressings and bandages.

(Lymphoedema Framework, 2006). Two episodes of infection (cellulitis) requiring hospital admission for intravenous (IV) antibiotics caused the oedema to worsen and the tissues began to break down. The presence of bacteria in the tissues of a chronic wound may act as a major factor in delaying healing by stimulating chronic inflammation (Moffatt and Vowden, 2008). This, in turn, causes further deterioration of the tissues.

Vascular studies were performed which demonstrated no significant problems and apart from some anaemia (treated with iron) and hypertension, there were no other medical problems to note. Past medical history was insignificant.

The leg deteriorated quickly despite frequent (often twice-daily) visits by the district nurses to try and stem the extensive lymphorrhoea. A basic estimate of the cost of treatment up to the point of referral to the

lymphoedema clinic was £32,320 (incorporating daily visits from district nurses for 18 months at £55 per visit, and two hospital admissions estimated at £2,300 each time). This does not consider the cost of dressings (estimated wound costs to the NHS are between £2–£3 billion per annum, which are not included in Government targets) (Posnett and Franks, 2008), drugs or cost to the patient with regard to quality of life.

On assessment at KLC, the leg demonstrated moderate oedema, extending from the toes (which showed a positive Stemmer's sign confirming lymphostatic disease) through the ulcerated calf, past the knee and into the thigh. The ulceration was severe — almost circumferential around the calf and the area was extremely inflamed and wet due to profuse leaking (Figure 1). It was also extremely painful and malodorous, often causing nausea and further psychological distress and embarrassment.

Overall, the patient's quality of life was poor. Function and mobility was restricted (despite the knee replacement, her gait was severely affected; there was a noticeable limp and the leg was very stiff, particularly at the knee and ankle), and AB relied on a stick for support. Clothing and footwear proved difficult — being soaked within minutes — and AB was very frustrated and depressed about her general condition that had been so troublesome for almost three years (18 months of that involved 1–2 visits per day from the community teams).

Such wounds are commonly infected and the first priority was to address this. A course of antibiotics was initiated following the British Lymphology Society/Lymphoedema Support Network guidelines (BLS/LSN, 2009).

Pain control was also urgently addressed and Fentanyl patches were introduced with co-adjuvant medication to ensure comfort, particularly at dressing changes. Entonox[®] was also mooted. However, AB was stoical and reluctant to take medication and, despite

the team's best efforts, she refused to continue with the medication, mainly because she felt she 'lost control' — the one thing at least, she could do something about.

Skin hygiene for lymphoedema patients is essential to prevent infection and, as this had proved to be a problem in the past, it was crucial in this case. Due to the intense pain, the wounds were gently irrigated at every visit, and the surrounding, healthier skin washed with a soap-less cleanser and carefully patted dry. Washing the limb had not been part of her care up to clinic involvement, and the author's experience is that this is a common occurrence in the local community setting. Due to staffing issues plus lack of time and resources, such a skin care routine is often omitted from patient care which can prove detrimental and cause further problems for patients in this arena (Moffatt, 2007).

A bland emollient was used on the healthy tissues to hydrate and prevent further maceration and tissue breakdown, especially between the digits to help prevent further bacterial and fungal infections.

Up until her visit to clinic, many different dressings had been tried by the community teams, to which most AB had proved sensitive, causing further skin fragility and breakdown. Although worried about using a new product and fearful of causing further problems, AB was finally persuaded to try the Cutimed Sorbact range, especially as the products contain no chemicals. Though presented folded, Cutimed Sorbact swabs are versatile in use and can be used unfolded to cover larger wounds (Figure 2). This is particularly useful on circumferential ulcers such as AB's. The dressings were placed directly onto the wounds and left in place for several days, as the wounds were so painful at dressing change. As the level of lymphorrhoea was so extensive, they were covered with Cutimed Sorbact pads (for comfort) (Figure 3), plus Cutisorb Ultra due to its high absorbency to ensure that the extensive exudate did not leak through the dressings and bandages. The latter dressings were changed at every visit until leakage reduced and then a Cutimed Sorbact pad was used alone as a secondary dressing over the Cutimed Sorbact swab.

MLLB is commonly applied to such patients with chronic oedema and lymphorrhoea (Lymphoedema Framework, 2006), and this case was no exception. As the digits were swollen, toe bandaging (Easifix®, BSN medical) was implemented, with the usual wadding applied to ensure a conical shape was achieved. This provided a graduated profile for which to apply short-stretch (Comprilan®, BSN medical) bandages. These were applied with an even tension and overlap, thereby encouraging fluid away from the congested areas.

Although initially extremely painful, the dressing changes soon became easier, particularly as the team were able to leave the Cutimed Sorbact swabs as the primary dressing in place for several days. Gradually the lymphorrhoea reduced.

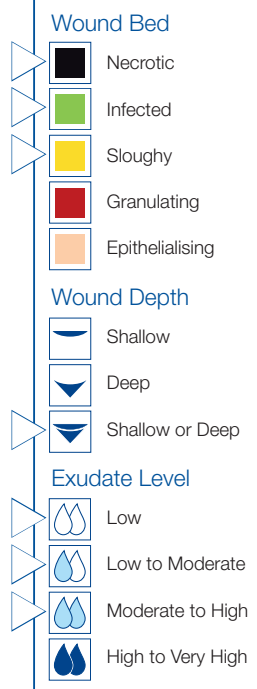
Exercise is another component of managing chronic



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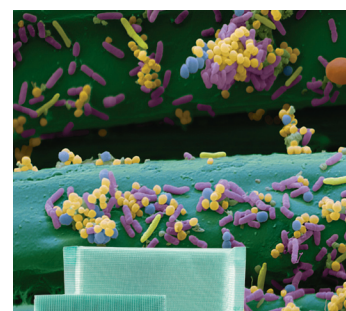
CUTIMED SORBACT is the only range of dressings coated with DACC that can reduce the bacterial load.

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Figures 4 and 5. Lessening of lymphorrhoea could be seen after two (Figure 4, top) and three weeks (Figure 5, bottom) of treatment with the Cutimed range.

oedema and ankle joint movement is a vital mechanical element of the functioning calf pump (Davies et al, 2008). This promotes venous and lymphatic return and helps to address ankle and knee stiffness and poor mobility. A sheet of exercises was given and AB was encouraged to perform them three times every hour throughout the day. Elevation at rest was also encouraged and AB was persuaded to sleep in bed, rather than in her chair. A foam support was loaned to help support the knee and prevent pressure on the calf, and a bed cradle also prevented the weight of the bedding pressing on the legs.

Although swelling was evident in the knee and thigh, the main priority (and goal of treatment) was to manage the leg wounds. Manual lymphatic drainage (MLD) and a simplified version of this technique, simple lymphatic drainage (SLD) is often used to help manage chronic oedema/lymphoedema (Bellhouse, 2000). To prevent further exacerbation of oedema proximal to the bandaging, AB was taught simple SLD techniques in her thigh. Kinesio taping is another way of facilitating drainage (Kase et al, 2006) and this, too, was utilised after patch testing for allergy to the product. This enabled the author's team to omit the thigh

bandage that would have proven traumatic and more restrictive for this patient at this time.

Dressing changes were performed daily for four days and, as the lymphorrhoea lessened, extended to three times a week for three weeks (Figures 4 and 5). Appointments have now reduced to twice a week with the Cutisorb Ultra dressings being changed at every visit, while the Cutimed Sorbact pads remain in place for seven days.

Just two months (21 visits) after her initial consultation, AB is almost pain-free (even at dressing changes), the leg is healing well, there is obvious granulation tissue and the healthy tissues are extending around and into the wound. Limb movement and general function/mobility is also much improved. The odour, so prominent before treatment, has now completely resolved due to the effective reduction in bacterial load by the Cutimed Sorbact dressings (along with the nausea). The lymphorrhoea, although still evident, is well contained between clinic visits.

There is also a notable difference in AB's psychological status. She is smiling and chatting and feels more confident that a successful outcome will be achieved in the not too distant future.

The cost of treatment so far (excluding dressings and bandages) is £1,428, a huge saving in cost to the health service. The use of Cutimed Sorbact and Cutisorb Ultra dressings has contributed to this saving in terms of reduced number of dressings used and thus less nursing time needed. In addition, there has also been a great improvement to the patient's quality of life.

Case report two: chronic oedema with varicose eczema and lymphorrhoea

Mr CD was seen in the lymphoedema clinic following referral from the district nursing sister for management of his chronic oedema relating to joint replacement (left hip), venous insufficiency (previous deep vein thrombosis [DVT]), and increasing dependency (due to increasing weight of the swollen limb).

The leg oedema (although slight in both legs before surgery due to venous insufficiency and post-phlebotic syndrome) became more troublesome in the left leg following the hip replacement (January 2010), and soon began to further restrict limb function and mobility. Further DVT was excluded, but despite continued use of a thrombo-embolic deterrent (TED) stocking and elevation (advice given by the hospital team), the swelling soon escalated out of control (Figure 6).

As a result, CD was unable to wear shoes and clothing became difficult as the lymphorrhoea constantly soaked his trousers. He was also unable to work (as a school caretaker) and was on extended sick leave. The cost to patients can be immense and it has been demonstrated that up to 80% of sufferers within one catchment area had to be off work, 9% had to change their employment status, 2% had to swap jobs, and 8% had to give up work entirely (Moffatt et al, 2003). Chronic oedema has a strong psychosocial implication and can be a financial burden to the NHS. Like many other chronic disorders, it also requires lifelong care and attention along with psychosocial support.

Normally an active gentleman, the reduced mobility was extremely frustrating to CD. Although his painful hip had improved due to the replacement, all benefits were lost as the leg was uncomfortably swollen and he was unable to ride his bike (his only mode of transport). Not only did he become isolated in his rural home, he also began to put on weight, which in turn worsened the oedema and reduced the amount of exercise he could do. As reduction in the range of movement at the ankle leads to reduced calf muscle pump efficiency (Kugler et al, 2001), venous hypertension is generated leading to exacerbation of oedema.

Varicose eczema (due to venous stasis) (Figure 7) began to complicate the picture. As the skin was itchy, CD scratched, causing trauma to the tissues and lymphorrhoea ensued. The open areas provided an ideal medium



Figure 6. Mr CD's swelling continued despite continued use of TED stocking and elevation.



Figure 7. Development of varicose eczema.



Figure 8. Application of Cutimed Sorbact ribbon.



Figure 9. Easifix bandage *in situ* to secure ribbon and increase tissue resistance.

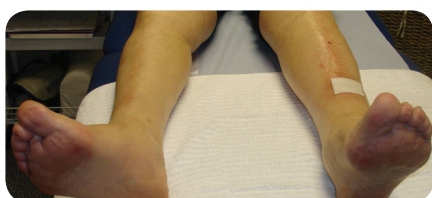


Figure 10. After one week of treatment a reduction in the eczema and inflammation could be seen.

for infection, and cellulitis developed requiring hospital admission for IV antibiotics.

Upon discharge, the community team became involved and daily visits were instigated over four weeks to try and control the exudate. However, the varicose eczema became particularly troublesome around the forefoot and toes. As the district nursing team were not skilled in MLLB, CD was referred to the KLC.

Following a full assessment to ascertain the nature of the swelling and to rule out contraindications for treatment, e.g. cellulitis, arterial incompetence, the usual cornerstones of DLT plus appropriate wound care were implemented.

Digit swelling responds well to toe bandaging (McCann, 2008). However, in this case, the toes and forefoot were severely macerated and although the district nurses had implemented the usual topical steroids, there had been little response. Indeed, CD appeared to be sensitive to the products resulting in a worsening of his skin condition.

Applying appropriate dressings to swollen digits can prove challenging. However, using Cutimed Sorbact ribbon (Figure 8) not only helped to reduce the bacterial load and therefore treat the eczema, but also addressed fungal infection so often present in such cases. Used in the same way as usual toe bandages, the ribbon was secured in place by a conforming bandage (Easifix[®], BSN medical) to gently increase the tissue resistance (Figure 9). Cutimed Sorbact pads were added to the dorsum of the foot and retained in place under the conforming bandage. The lymphorrhoea was contained well within the pads and no strikethrough was reported at any time.

The usual skin care techniques were introduced before dressing changes (careful washing and drying of the feet, especially between the toes), and the skin was moisturised with a bland cream. All other topical steroids were discontinued.

The MLLB system using wadding and short-stretch bandages offered appropriate support to the foot and limb and, by the second dressing change, the limb was almost dry and the skin condition vastly improved. The itching and skin eczema were better, and the inflammation substantially reduced (Figure 10).

Leg exercises were introduced from the onset — specific ankle, foot and calf movements encouraged regularly throughout the day. By the end of the first week, CD was back on his bike (with bandages *in situ*) and was feeling much better physically and psychologically.

The overall leg swelling was controlled within two weeks. By the end of week three (ninth appointment), CD was in compression garments (Jobst[®] Elvarex[®] Custom-fit, BSN medical), made-to-measure, flat-knit, CCL2 to maintain and optimise his condition (Hardy, 2006). He was able to wear normal shoes once again and by week four was ready to go back to work.

This case report again highlights the cost-saving benefits of proactively managing chronic oedema. CD's experience was lengthy (over three months before referral to lymphoedema was made), and probably unnecessary if appropriate treatment could have been implemented sooner. Cellulitis is considered to be the fourth most common admission to hospital at the present time (Mortimer, 2009). At a cost of around £2,300 for each admission, if just 2–3% of patients admitted to hospital with cellulitis could be reduced, thousands of pounds would be saved (Hampton, 2010).

With appropriate education for these groups of patients (as well as education for healthcare professionals on targeting those patients at risk and early intervention strategies), such cases could be more effectively managed, sometimes prevented, and substantial savings made to the health service and patient quality of life.

Case report three: longstanding lymphoedema with chronic wounds

Mrs EF, a 59-year-old female who had longstanding gravitational lymphoedema of both legs related to cerebral palsy, obesity and little mobility. The right limb developed a wound after catching the leg of her wheelchair, some eight months before referral to the clinic. During this time, the district nursing team had been visiting daily (at an average of £55, the cost amounted to £12,320 excluding dressings, drugs, ointments or bandages). The wound was excoriated, leaking, uncomfortable and malodorous (Figure 11). There had been two acute attacks of cellulitis, one requiring hospital admission (estimated at £2,300), that subsequently caused the wounds and the swelling to worsen.

Due to this patient's body weight and lack of mobility, home visits were required and following a full holistic assessment, DLT was suggested involving the usual cornerstones of treatment.

Up to this point, MLLB had not been implemented (due to lack of lymphoedema education in the area) and a variety of different primary dressings had been used without success, including honey, silver and a variety of topical creams and steroids under wadding and crepe bandages. EF had suffered many reactions to some of these products and was nervous about trying something different. The wounds were also extremely uncomfortable and itching was a particular problem that was difficult to control.

In light of the recurrent infections, (two or more infections in 12 months), the patient was put on prophylactic antibiotics following the BLS/LSN guidelines (2009). Daily skin care and hygiene were incorporated and initially simple NA and absorbent dressings were applied. Although some success was achieved in reducing the swelling, the wounds did not improve and after discussions with the team and family, Cutimed Siltec foam dressings were introduced beneath the bandage system.



Figure 11. Excoriated, leaking and malodorous wound at presentation.

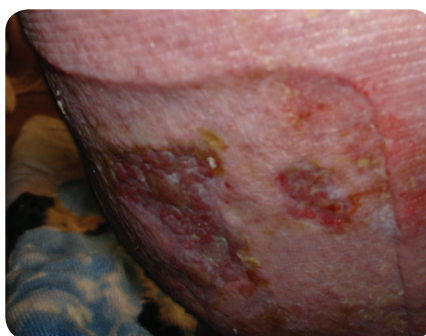


Figure 12. After three weeks' treatment, the wound had almost healed.

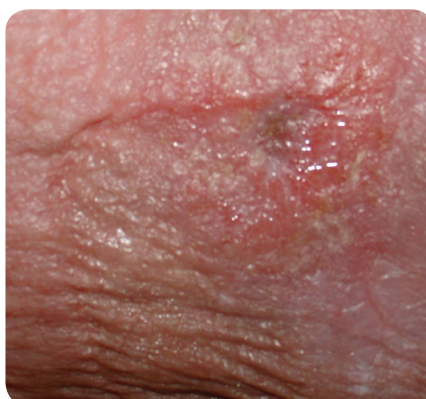


Figure 13. Wound completely healed with the skin in good condition.

These were successful in absorbing exudate due to the layer of 'super-absorbers' that help retain exudate under compression. More importantly, they proved comfortable and because of the silicone wound contact layer, were atraumatic at dressing changes. Interestingly, the intense itching became much less of a problem.

Exercise is another feature of DLT that helps to promote lymphatic drainage. Due to the limb paralysis, active exercise was not possible. However, Mrs EF's husband was shown how to perform passive leg movements whenever he could (at least every hour).

After three weeks (nine visits) during which time dressings were changed three times per week, the wound had almost healed (Figure 12). However, the skin remained fragile. To protect this, underneath the compression garments required to maintain and optimise the oedema reduction, Cutimed Siltec L dressings were applied with good effect. These dressings help to protect fragile skin due to their silicone wound contact layer, which also maintains a moist wound environment promoting wound healing. The wound has now completely healed (Figure 13) and the skin is in excellent condition. The lymphoedema is well controlled with Jobst Elvarex Soft Custom-fit (BSN medical) CCL2 worn from morning until bedtime. Skin care is a daily component of care and passive movements have continued.

EF's lymphoedema is a long-term condition that is unlikely to resolve due to lack of mobility related to her cerebral palsy. Patient education and self-management is therefore paramount to ensure that further complications are avoided. These are not possible unless patients have a good understanding of their condition and are empowered to respond to problems as they arise (Jenns, 2000).

EF was therefore informed of the importance of the continued use of compression garments not only to

Key points

- ▶▶ Chronic oedema is classified as a swelling that does not respond to elevation or diuretics and which has been present for three months or more.
- ▶▶ Cutimed® Sorbact® for topical antimicrobial management and Cutimed® Siltec and Cutisorb® Ultra dressings for exudate/fluid management from BSN medical can help to manage such conditions in conjunction with appropriate decongestive lymphatic therapy (DLT).
- ▶▶ Atraumatic dressings will help to reduce the adherence of the product both to the wound bed and the surrounding skin.
- ▶▶ With support, education and guidance, the methods used by lymphoedema specialists can easily be incorporated into community nurses' practice (Todd et al, 2008).

promote lymphatic drainage, but also to offer further protection to her vulnerable legs. By minimising trauma and injury, further infections will be reduced (as will the cost to the health service).

Conclusion

If left untreated, chronic oedema will gradually worsen with an increased risk of developing injury, ulceration and infection, often with profuse lymphorrhoea which can cause severe patient distress both physically and psychologically. These are problems that will potentially further damage or obstruct lymphatic drainage and oedema will deteriorate further.

Such patients are placing ever-increasing demands on community nurses' time and resources. However, with support, education and guidance,

the methods used by lymphoedema specialists can easily be incorporated into community nurses' practice (Todd et al, 2008).

Utilising the BSN Cutimed Sorbact, Cutimed Siltec and Cutisorb Ultra dressing ranges into an integrated therapy approach with toe bandaging and MLLB to improve shape and volume, the condition of the skin can be improved. Moreover, as shown by these case reports, the results are quick, cost-effective and have a positive impact on patient quality of life, especially when they are involved in their care planning from the outset. **WUK**

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