A chronic wound is defined as one that does not heal in an orderly sequence or predictable timeframe and fails to progress along the wound-healing continuum. In the UK alone, there were recently estimated to be 1.3 million chronic wounds, of which 153,000 were pressure ulcers, 253,000 dehisced surgical wounds, 169,000 diabetic foot ulcers and 730,000 leg ulcers (Guest et al, 2015). A leg ulcer is defined as a wound between the knee and the ankle that takes more than two weeks to heal (National Institute for Health and Care Excellence [NICE], 2016).

The biggest burden of chronic wounds, however, falls on patients and families. As mentioned above, increases in exudate production and bacterial burden can lead to pain, discomfort and anxiety due to increased dressing changes (Edwards, 2013).

Similarly, patients often experience psychosocial problems such as embarrassment and a loss of dignity when a chronic wound leaks exudate and becomes malodorous (Faucher et al, 2012). As well as the emotional impact, a chronic wound will also frequently involve the patient having to wear oversized clothes/footwear to accommodate wound dressings and disguise any exudate leakage, which can impact on mobility (Persoon et al, 2004). Leakage may also impact upon the patient’s everyday household duties as it can increase the amount of laundry and personal hygiene needs, which may be physically challenging for some patients (Tickle, 2016).

The burden of chronic wound management can also put enormous pressure on clinicians, particularly community nurses. Chronic wounds are associated with increased exudate levels, which if not managed properly can lead to a greater risk of wound infection, skin maceration and delayed healing (Tickle, 2016). For the community nurse, wound chronicity leads to more patient appointments and an increased use of resources and wound dressings, with 61-64% of the cost associated with the management of venous leg ulcers, for example, related to community nursing visits (Guest et al, 2015).

Joy Tickle, tissue viability nurse specialist; clinical lead, Shropshire Community NHS Trust

Clark et al, 2012 outlined plans to introduce cost savings to close a funding gap of £30 billion by 2020/21.

The burden of chronic wound management can also put enormous pressure on clinicians, particularly community nurses. Chronic wounds are associated with increased exudate levels, which if not managed properly can lead to a greater risk of wound infection, skin maceration and delayed healing (Tickle, 2016). For the community nurse, wound chronicity leads to more patient appointments and an increased use of resources and wound dressings, with 61-64% of the cost associated with the management of venous leg ulcers, for example, related to community nursing visits (Guest et al, 2015).

Joy Tickle, tissue viability nurse specialist; clinical lead, Shropshire Community NHS Trust

The cost of wound management to healthcare providers in the UK is estimated to be between £4.5–5.1 billion per year, two-thirds of which is incurred in the community setting. In hospitals it is estimated that between 25–40% of beds are occupied by patients with wounds (Posnett et al, 2009). This financial burden can only have a negative impact on the already over-stretched NHS budget, particularly as NHS England’s Five Year Forward View (NHS England, 2014) outlined plans to introduce cost savings to close a funding gap of £30 billion by 2020/21.

It is important that community nurses remember that wound exudate is a natural and vital component of the wound-healing process, which is generated as a part of the natural wound inflammatory response and proliferative phase and, in the author’s experience, is essential for the reparative process. When a wound becomes chronic, however, this can involve changes in the volume and viscosity of wound exudate, resulting in significant clinical challenges for the patient and the community nurse.

Bacterial load

Increased exudate is associated with the presence of biofilms, surface-attached communities of microorganisms that are encased in a
impaired venous return/lymphatic drainage. This, in turn, can lead to non-healing ulceration, ‘weeping’ oedema, skin excoriation/maceration and increased risk of wound/skin infection (NICE, 2016).

Compression therapy is the ‘gold standard’ treatment for venous leg ulceration and is also effective in the management of lower limb oedema. It is therefore imperative that community nurses implement an effective wound assessment and management plan alongside compression therapy.

WOUND MANAGEMENT

To effectively assess and manage wounds it is essential that community nurses first address all the factors that might act as a barrier to wound healing. The TIME acronym may assist clinicians when considering these barriers (Figure 1), including the presence of non-viable tissue; inflammation and infection; impaired extracellular matrix formed of carbohydrates, proteins and/or DNA. Biofilms form an extremely effective protective barrier against antibodies, antibiotics and antimicrobial agents (Schultz and Dowsett, 2012), and mature biofilm colonies can form in 2–4 days, perpetuating the inflammatory response and resulting in increased exudate and slough (masses of dead cells that collect in the exudate) and wound degeneration.

This increased exudate and slough escalates the bacterial burden, which increases the risk of critical colonisation and or wound infection (Vowden et al, 2015).

Another consequence of increased exudate and slough is more frequent dressing changes due to exudate strikethrough and leakage, as well as subsequent periwound maceration caused by the enzymes contained within the exudate. Frequent dressing changes can lead to skin stripping (Drewery, 2015), and these types of periwound skin damage can increase pain and discomfort for the patient (Vowden et al, 2015).

Leg ulceration

The location of the wound may also influence the level of exudate, for example, venous leg ulcers and lower limb oedema involve high fluid volumes due to underlying strikethrough, which would contribute to improving the patient’s quality of life. The author also began to apply inelastic compression bandaging (Actico®; Activa Healthcare/L&R) to help manage the exudate levels. The conformable properties of the Flivasorb dressing ensured that it was comfortable underneath the compression therapy and did not affect the sub-bandage pressures exerted by the compression.

Within two weeks, the wound showed reduced exudate levels, increased granulation tissue and improved periwound skin condition, while the patient commented that the dressing increased her comfort levels (Figure B). The reduction in exudate levels and management of the patient’s distorted limb shape meant that the compression bandaging could then be changed to a compression hosiery kit (Leg Ulcer Hosiery Kit®; Activa Healthcare/L&R).

This case shows that a reduction in exudate levels when managing leg ulcers can trigger a review not only of the type of dressing selected, but also the type of compression. This can bring about reductions in clinicians’ time and improve quality of life for the patient.

Figure 1.
The TIME acronym indicates potential barriers to wound healing.

Figure A

WOUND CARE

Case Study

Ms L is a 70-year-old woman with chronic leukaemia who presented to the tissue viability service with a 12-month history of chronic lower limb ulceration. On presentation the wound bed consisted of a combination of sloughy and necrotic tissue with high levels of exudate and malodour, while the limb itself was distorted in shape. Debridement of the wound was difficult due to pain and discomfort experienced by the patient (Figure A). Following assessment, a treatment plan was implemented using a Monofilament Fibre debridement pad (Debrisoft®; Activa Healthcare/L&R) to debride the wound bed with minimal discomfort to the patient. This allowed speedy removal of the devitalised tissue and assisted in reducing bacterial burden.

The author decided to use a superabsorbent dressing (Flivasorb®; Activa Healthcare/L&R), mainly to allow the effective management of the high levels of exudate being produced by the wound and to reduce the amount of dressing strikethrough, which would contribute to improving the patient’s quality of life. The author also began to apply inelastic compression bandaging (Actico®; Activa Healthcare/L&R) to help manage the exudate levels. The conformable properties of the Flivasorb dressing ensured that it was comfortable underneath the compression therapy and did not affect the sub-bandage pressures exerted by the compression.

Within two weeks, the wound showed reduced exudate levels, increased granulation tissue and improved periwound skin condition, while the patient commented that the dressing increased her comfort levels (Figure B). The reduction in exudate levels and management of the patient’s distorted limb shape meant that the compression bandaging could then be changed to a compression hosiery kit (Leg Ulcer Hosiery Kit®; Activa Healthcare/L&R).

This case shows that a reduction in exudate levels when managing leg ulcers can trigger a review not only of the type of dressing selected, but also the type of compression. This can bring about reductions in clinicians’ time and improve quality of life for the patient.
uncontrolled moisture balance (too much or too little moisture in the wound); and any changes in the wound edges or surrounding skin.

Debridement
Devitalised tissue must be effectively debrided to assist tissue repair (Strohal et al, 2013); not only does this optimise wound healing, but it also allows the clinician to have a clearer picture of the wound and surrounding skin (Stephen-Haynes and Callaghan, 2012). Devitalised tissue (including necrosis and slough) may lead to increased bacterial bio burden/ infection, malodour and increased pain and distress for patients, all of which impede wound healing.

Once the wound has been successfully debrided, the community nurse is able to:
- Assess the tissue type(s) within the wound
- Record the wound size and depth
- Assess the condition of the periwound skin/tissue.

By obtaining a clearer picture of the wound’s status, an appropriate and timely treatment regimen can be implemented. When considering which method of debridement to use, e.g. mechanical, sharp or autolytic, it is important that the community nurse chooses one that is effective, safe, and acceptable to the patient.

Newer mechanical debridement tools use Monofilament Fibre Technology® (Debrisoft®; Debrisoft® Lolly; Activa Healthcare/L&R) to effectively remove dead tissue, slough and hyperkeratosis, facilitating gentle debridement within minutes. From the author’s clinical experience, all staff (and carers/patients) can successfully debride wounds/skin using monofilament fibre pads due to their simplicity. As well as the clinical benefits, using monofilament fibre pads can reduce nursing time and promote increased skill-mix within the clinical team as different levels of staff are able to use them (NICE, 2014; Tickle, 2016).

Early and regular wound debridement is likely to accelerate wound healing and is associated with reductions in odour, bacterial burden, slough and exudate as a result of biofilm disruption (Vowden and Vowden, 2011).

In a recent survey of 475 clinicians, 87% reported that exudate production reduced in a very short period of time following a two-week biofilm pathway incorporating Debrisoft. This is most likely because the biofilm had been managed (Morris et al, 2016).

Skin care
Maintaining healthy skin is also extremely important. Patients with lower limb conditions such as oedema, or underlying venous or lymphatic complications may present with skin changes such as hyperkeratosis (dry scaly areas of skin), dermatitis and cellulitis, which, if not managed effectively can lead to leaking ‘weepy’ limbs and chronic ulceration. These symptoms can be managed with regular cleansing and debridement, lower limb elevation, and compression therapy (Scottish Intercollegiate Guidelines Network [SIGN], 2010).

Compression therapy
Compression therapy using either bandages or hosiery is designed to support the veins in the lower limb and increase circulation in the legs. Compression is fundamental to controlling lower limb oedema, managing venous ulceration and skin changes, and reducing exudate. Compression also improves limb shape and reduces wound size.

Before beginning compression, however, it is imperative that the community nurse undertakes a robust assessment of the patient and their wound/skin, as well as performing a vascular assessment to make sure there are no contraindications, such as arterial disease.

The choice of compression therapy will depend upon the outcomes of the assessment, the clinician’s knowledge and skills, the available resources and patient choice. For example, assessment may indicate that a patient with a heavily exuding wound initially requires compression bandaging; whereas lower exudate levels may be more suited to a hosiery kit.

In cases of lower limb oedema, particularly where exudate or leaking is a challenge, cohesive inelastic bandages are recommended as they reduce oedema more quickly than elastic bandages, therefore having a positive impact on exudate reduction (Atkin and Tickle, 2016). This is due to the higher standing and working pressure and lower resting pressure of inelastic systems (e.g. Actico®, Activa Healthcare/L&R), which improves patient comfort at the same time as increasing the effectiveness of the calf muscle pump (where the muscles in the calf help to return blood to the heart during walking) (Wounds UK, 2014).

Hosiery kits
When limb distortion and exudate volumes have been successfully reduced with compression bandaging, the patient can be stepped across to an effective alternative such as a leg ulcer hosiery kit. The use of hosiery kits has been endorsed by a recent randomised control trial, the Venus IV trial, which highlighted that the use of active compression hosiery kits are a viable and cost-effective alternative to graduated compression bandages, with the added benefit of reducing recurrence rates, an effect believed to be related to the promotion of patient self-care (Ashby et al, 2014).

Dressing selection
Moist wound healing is essential and requires a balance between excessive moisture and the wound bed becoming too dry (White and Cutting, 2006). Effective dressing selection is an important component in achieving this balance.

It is essential that the community nurse fully understands that dressing selection should be tailored to the condition of the wound and the type and amount of exudate being produced (Dowsett, 2012); furthermore, they should understand the composition and mode of action of dressings that have been designed to manage exudate so that they can select the most appropriate dressing and apply it effectively and efficiently. For example, while foam dressings are commonly used to control exudate, their fluid-handling capacity may be inadequate, which can mean the
nurse needs to perform more frequent dressing changes; also, foam dressings may struggle to contain fluid under pressure, eg under compression bandaging (Jones, 2016).

Wound dressings vary in the way they absorb and retain exudate, for example, simple absorptive dressing materials take up fluid into spaces in their structure by wicking the exudate laterally, across the dressing (or in some cases vertically into the dressing) and are aided by moisture vapour transmission (a type of evaporation). However, to help solve the problem of fluid retention within the dressing, other products form a gel or use fibres/particles to trap or ‘lock-in’ exudate and its components (e.g. bacteria and proteases), helping to influence the composition of exudate in the wound (World Union of Wound Healing Societies [WUWHS], 2007).

Often, dressing products combine different materials, and techniques resulting in a wide range of products that vary considerably in their fluid-handling characteristics and abilities (Romanelli et al, 2010). It is particularly important that community nurses consider a dressing that retains fluid effectively when it is used under compression. If not, the pressure may cause fluid to leak from any dressing used, causing the harmful exudate to make contact with the wound/skin.

An effective absorbent dressing selection will make a real contribution to the healing progress of the wound and, most importantly, the comfort, and quality of life for the patient (Stephen-Haynes, 2011). The crucial attributes of an effective absorbent dressing are shown in Figure 2.

**FLIVASORB®**

The Flivasorb® (Activa Healthcare/L&R) range of dressings offers the community nurse the choice of a conformable superabsorbent dressing that acts as a primary dressing for the management of moderately-to-heavily exuding superficial wounds. Flivasorb is indicated for use in the following wound types:
- Pressure ulcers
- Arterial ulcers
- Venous leg ulcers
- Leaky legs
- Diabetic ulcers
- Postoperative wounds which heal

**KEY POINTS**

Community nurses should consider the following when providing exudate management:

- **Assess:** undertake a robust and holistic assessment, considering any factors which act as a barrier to wound healing (TIME is a useful acronym to remember in this.) Debridement aids wound assessment, and regular use is likely to accelerate wound healing and is associated with reductions in odour, bacterial burden, slough and exudate. Debrisoft® is a safe, fast and effective option for debridement.

- **Dress:** moist wound healing is essential and requires a balance between excessive moisture and the wound bed becoming too dry – effective dressing selection is an important component in achieving this. An effective absorbent dressing should: support moist wound healing, absorb and retain exudate, reduce bioburden, prevent skin maceration/excoriation, facilitate patient comfort and improved quality of life, assist in optimising healthcare resources, and work effectively under compression. Flivasorb® is shown to deliver these benefits.

- **Compress:** compression is fundamental to controlling lower limb oedema, managing venous ulceration and reducing exudate. Where exudate is a challenge, cohesive inelastic bandages such as Actico® are recommended.

When limb distortion and exudate volumes have been successfully reduced, leg ulcer hosiery kits, such as Activa® or ActiLymph® Hosiery Kits, are an effective solution for continuing care.

**Figure 2.**

*Main attributes of an effective absorbent dressing.*
by secondary intention
- Fistula exit sites.

The dressing’s polyethylene wound contact layer helps to prevent adhesion to the wound bed and periwound skin (meaning an additional primary wound contact layer is not required under Flivasorb), while the superabsorbent cellulose core successfully absorbs and locks-in exudate (Figure 3). This results in less risk of leakage, and maceration/excoriation to the periwound skin and increased comfort and confidence for the patient. This capturing of exudate also locks away protease enzymes that can delay wound healing (Wiegand et al, 2009a;b). Flivasorb’s outer layer protects the patient’s clothes from leaking exudate.

Specific benefits of Flivasorb include (Wiegand et al, 2013):
- Ability to absorb and retain of large amounts of exudate
- Low rewet
- Prevention of maceration and excoriation
- Reduction of bioburden
- Effective underneath compression.

For the clinician, these properties result in reduced dressing changes and less clinician time as well as improved patient quality of life (see case study). The main benefits of Flivasorb are shown in Table 1.

Flivasorb is also available as an adhesive dressing (Flivasorb® Adhesive; Activa Healthcare/L&R), which combines the tried-and-tested benefits of Flivasorb, with the convenience and comfort of a skin-friendly, flexible adhesive membrane. This is ideal for pressure ulcers, cavity/sinus wounds and dehisced surgical wounds.

### Evidence

Various case studies have demonstrated the efficacy of Flivasorb in practice. Faucher et al (2012) investigated the use of Flivasorb in 15 patients with highly exuding wounds, finding a reduction in periwound maceration and reduced dressing change; while Verrall et al (2010) looked at 16 patients with highly exuding wounds and also found that using Flivasorb resulted in reduced dressing change frequency, which, in turn, reduced the cost of treatment for each patient. Verall et al (2010) also highlighted the dressing’s effectiveness under compression and positive impact on healing progression.

### CONCLUSION

Wounds with high levels of exudate can seriously impact the patient’s quality of life, with problems including strikethrough, odour and...
periwound skin maceration. This also involves increasing costs for community nurses, both in terms of their own clinical time and wider healthcare resources.

It is important to heal these wounds as quickly as possible and the community nurse needs to understand how to perform a holistic wound assessment before implementing an evidence-based management plan, including wound debridement and the use of an effective absorbent dressing and, where appropriate, compression therapy to manage exudate (see key points box).

This author has examined the development of chronic wounds and the problem of excess exudate production specifically, before looking at the benefits of the superabsorbent dressing Flivasorb, which has been shown to demonstrate enhanced exudate control, reduced nursing time and periwound skin maintenance. JCN

**REFERENCES**


