

# Exsudex™: another means of managing exudate

Heavily exuding wounds can cause discomfort to the patient as well as inhibiting healing and causing peri-wound maceration. The cost implications of managing heavily exuding wounds create concerns for both clinicians and budget managers. The clinician must examine both clinical and cost-effective means of exudate management. The Exsudex™ wound drainage device offers an alternative to the many absorbent dressings on the market for managing heavily exuding wounds by using topical negative pressure to encourage healing. This article discusses its effectiveness using case studies to illustrate its use.

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## KEY WORDS

Exudate management  
Wound drainage  
Topical negative pressure

The management of heavily exuding wounds and the dangers of peri-wound maceration are well documented (Hampton and Stephen-Haynes, 2005; White and Cutting, 2006). The assessment and management of exudate is a vital component of wound management both to ensure the patient's comfort and to enable more effective healing.

Assessment of the patient and their wound should include consideration of the concerns of the patient and their carers regarding leakage, odour, discomfort, pain, sleep disturbance and emotional distress (WUWHS, 2007). In addition, the performance of their current dressing should be assessed with regards to fluid handling and retention, number of dressings

required, frequency of dressings, sequestration of exudate components (Newman et al, 2006), conformability and how it is applied to the patient. The production of exudate is considered beneficial when treating an acute wound as it prevents the wound bed from desiccating, aiding the migration of tissue-repairing cells, provision of nutrients, enabling the diffusion of growth factors and the rehydration of necrotic tissue also enabling autolytic debridement (WUWHS, 2007). However, the patient sees only that their wound produces fluid which can cause them distress and inconvenience, so it remains vital that the practitioner's goals in exudate management coordinate with the needs of the patient.

### Causes of excessive exudate production

The practitioner should determine why the patient is producing large volumes of exudate. The causes may be related to wound aetiology (for example, a large cavity pressure ulcer). Jones and Fennie (2007) performed a multi-site, retrospective analysis of patient charts and concluded that healing rates of large, exuding, pressure ulcers could be improved if practitioners were able to better match the characteristics of the wound with the selection of a wound dressing. This highlights the need for all wound care practitioners to ensure their knowledge is regularly updated and that they have the capability to

both assess and manage patients with highly exuding wounds.

Schofield et al (2000) interviewed by questionnaire practice nurses working at 143 different practices about their training and compression therapy management of patients with venous leg ulcers. The results were disturbing, highlighting that most practice nurses had minimal training in venous leg ulcer management and due to lack of confidence and proven competence were not applying therapeutic compression bandaging. As a consequence patients under the care of under-qualified and inexperienced nurses do not receive therapeutic treatment and are in danger of peri-ulcer maceration (Feben, 2003). This illustrates the need for appropriate and adequate training together with supervision for inexperienced nurses to ensure a therapy is used to prevent damage to skin and tissue integrity by poorly controlled exudate in patients with venous leg ulcers.

Hypoalbuminaemia and its effects on osmotic and hydrostatic pressure lead to an imbalance between fluid within the tissues of the body and fluid in the blood capillaries (WUWHS, 2007). Abnormally low levels of plasma protein lead to excessive amounts of fluid within tissues and if a wound is present the body uses this as a safety valve, vastly increasing

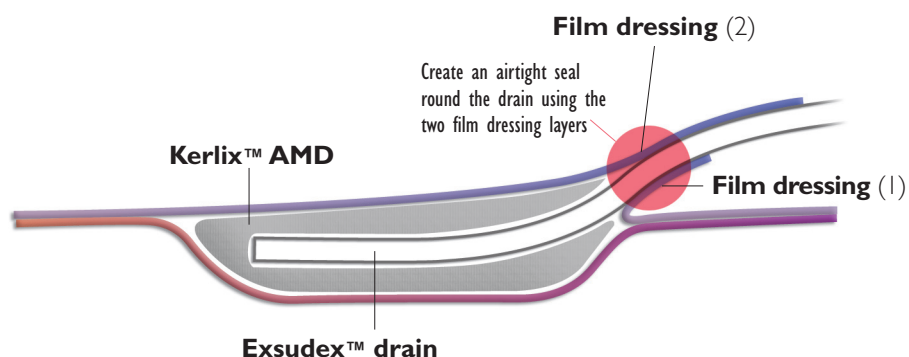


Figure 1. The wound before connection to the pump with the film dressing acting as a seal.

exudate levels. This may be the cause of wound dehiscence in the extremely malnourished patient. Conversely, patients with dehisced surgical wounds of another cause, such as haematoma, often produce large volumes of exudate, leading to hypoalbuminaemia.

Common causes of hypoalbuminaemia include:

- ▶▶ Malnutrition — either in obese or debilitated patients (Armstrong, 1998)
- ▶▶ Prolonged starvation preoperatively (Goode et al, 1992)
- ▶▶ Intransigent *Clostridium Difficile* infection, leading to poor nutrient absorption
- ▶▶ Large, heavily exuding wounds (Lewis, 1996).

As a consequence of the difficulties in managing heavily exuding wounds, practitioners view with interest any product or device that will improve wound management, particularly when it exhibits the potential for protecting the surrounding skin. Tissue viability nurses and wound care specialists have both clinical and organisational responsibilities and therefore need to be highly critical of wound dressings and perform stringent evaluations to ensure such dressings are fit for purpose and will provide the desirable clinical and cost-effective outcomes. In 2000 the prescription cost analysis for wound management and other dressings was in excess of £69m (DoH, 2001), by 2001 it had risen to almost £77m (DoH, 2007). Highly exuding wounds are expensive to manage and the time and frequency of dressing change required for such wounds is

often a hidden cost. McGuckin et al (2000) estimated the cost of a single district nurse visit providing treatment of a venous leg ulcer to be £136. In 1997 Robinson stated: 'Dressing changes are the major component of the cost of wound care, exudate is probably the primary reason why dressings are changed'.

#### Wound drainage

Wound drainage devices have existed for many years (Maitland and Maitland, 1970) and the natural progression from wound drainage is topical negative pressure for which there are several devices available (Fleischman et al, 1995; Morykwas et al, 1997; Miller and McDaniel, 2006). Closed surgical wound drainage has been in practice for many years (Bean 1983). While it aims to remove accumulating wound fluid or blood and helps to reduce the dead space created by the surgically induced wound (Banwell et al, 2005), its drawback is that it can only do so in the closed surgical wound. Closed surgical wound drainage is placed in situ at the time of surgery, while topical negative pressure may be applied at the time of surgery, post surgery if the wound dehisces or even in the community setting and is used as an active wound closure device.

However, there is still a place for a device which allows infrequent dressing and wound drainage with the option for topical negative pressure. There are open wounds for which topical negative pressure is contraindicated, but which still produce large volumes of exudate (Table 1) and would benefit from a wound drainage device.

Table 1

#### Indications for wound drainage device

- ▶▶ Fungating cavity wounds.
- ▶▶ Dehisced wounds with fistulae to an organ
- ▶▶ Open wounds with multiple bowel fistulae
- ▶▶ Patients with cavity wounds who cannot tolerate therapeutic topical negative pressure

The use of a drainage device enables the patient to retain dignity and feel their wound is being managed appropriately, while the practitioner can be satisfied that a clinically and cost-effective device is being used to manage wound exudate and maintain the integrity of the peri-wound skin.

#### Exsudex™ wound drainage device

The Exsudex™ wound drainage device (Synergy Healthcare, Derby) continues to provide a moist healing environment while removing excess exudate, thus preventing damage to the peri-wound skin. The device is lightweight and can be easily carried by the patient/carer or healthcare professional.

The dressing consists of Kerlix™ (Tyco Healthcare, Hampshire) which is moistened with sterile saline or water before application to the clean wound bed. This dressing conforms well to wound crevices allowing even distribution of negative pressure to



Figure 2. The Exsudex pump.



**Figure 3. Patient one: before the application of Exsudex™.**



**Figure 4. Patient one: following one week's application of Exsudex™.**



**Figure 5. Patient 2: pressure ulcer midway between scapula and thoracic vertebrae.**



**Figure 6. Patient 2: pressure ulcer before the application of Exsudex™ dressing.**

the wound area. The flat drain is then placed on top of the Kerlix™ dressing and moved into the optimal position for wound drainage. Another Kerlix™ dressing is then applied which is either moistened or dry depending on the exudate level of the wound. A film dressing is then applied to seal the wound area (Figure 1). The wound area is then connected to the Exsudex™ pump (Figure 2) via tubing to allow application of a negative pressure as either a drainage device or therapeutic topical negative pressure dressing.

### Case reports

#### Patient 1

The patient was male with multiple comorbidities, type 1 diabetes and multi-organ failure secondary to septicaemia who was seen following a seemingly innocuous injury to the dorsum of his left foot. The wound was debrided using larvae therapy. Once cleansed of the bulk of sloughy tissue an Exsudex™ wound drainage dressing was applied to promote angiogenesis and the growth of granulation tissue. Figure 3 shows the wound before application of the Exsudex™ drainage system. The wound was approximately 1cm deep with the wound bed being 90% clean with 10% superficial slough present. The foot was also oedematous secondary to hypoproteinaemia. One week later the foot was less oedematous due to a combination of elevation and the Exsudex™ drainage device (Figure 4). The wound bed was completely clean and consisted of healthy granulation tissue. Despite this positive outcome, the patient died suddenly following the rapid development of pericardial oedema.

#### Patient 2

The patient was a 72-year-old man who was admitted in a state of collapse following a cerebrovascular accident. He had fallen against a wall and developed a pressure ulcer in an unusual site, midway between his right scapula and thoracic spine. The patient was alcohol-dependant and was malnourished. The pressure ulcer was surgically debrided (Figures 5 and 6) and an Exsudex™ drainage dressing applied to the wound which



**Figure 7. Patient 2 following 2 weeks of topical negative pressure via Exsudex™ drainage device resulting in a healthy granulating wound bed.**

measured about 15cm in diameter and 2cm deep. Two weeks later, the wound was approximately 13cm in diameter and 1cm deep with noticeable healthy granulation tissue evident (Figure 7) at which point the Exsudex™ dressing was stopped and the patient discharged to community care. Before using Exsudex™, patient 2's wound required four large (15x15cm) hydrofibre dressings which needed to be changed twice daily in order to avoid maceration of the peri-wound skin. However, the Kerlix™ dressing required a twice-weekly change, saving valuable nursing time in addition to the more obvious cost savings (Table 2).

#### Patient 3

The patient was obese and his wounds had dehisced at the medial and lateral suture line following an emergency nephrectomy (Figure 8). Surgeons were concerned that due to the patient's malnourished state (total protein level albumin = 24g/dl) the wound would develop fistulae. They stated that topical negative pressure dressings were not to be used. This posed a conundrum, since the lateral wound was very heavily exuding and required dressing changes three times per day of three hydrofibre



**Figure 8. Patient 3 showing wounds that have dehisced at the medial and lateral suture line following an emergency nephrectomy.**



Table 2

Cost benefits for replacing a hydrofibre dressing with Kerlix dressings in conjunction with Exsudex

	Dressing	Cost per unit	Number used per week	Frequency	Total Cost
Patient 2	Hydrofibre 15x15cm	£4.87	56	Twice daily	£273.168
	Kerlix™ Large	£34.45	2	Twice weekly	£68.91
Patient 3	Hydrofibre 10x10cm	£2.58	63	Three times daily	£163.10
	Kerlix™ Large	£34.45	2	Twice weekly	£68.91

dressings in addition to saturating overlying surgical pads.

A discussion with the surgical team revealed that they were unaware that drainage devices could be used to manage exudate, consequently a large Kerlix™ dressing was used twice weekly to manage the exudate drainage, dramatically reducing the cost in dressings, piece for piece, from 63 hydrofibre (10x10cm) per week to just two Kerlix™ dressings per week. This patient's wound took three weeks to begin to show an improvement. Once the exudate level had fallen dramatically the Kerlix™ dressings were discontinued to allow the patient to be discharged to the care of community nurses.

#### Use of Exsudex™ in palliative wound care

The four most common symptoms associated with fungating wounds are pain, malodour, bleeding and exudate (Hampton, 2004). The effective management of exudate from a



Figure 9. Heavily exuding fungating breast wound.

fungating wound often requires very frequent dressing changes to avoid maceration of the surrounding skin, saturation of dressings and staining of bedclothes and clothing. It is thought that fungating wounds produce such copious amounts of exudate due to vascular permeability factor released by the tumour cells causing increased permeability of blood vessels within the tumour (Haisfield-Wolfe and Rund, 1997).

Such wounds cause extreme distress to both patient and carers. Naylor (2002) describes the psychosocial impact of such wounds on the patient leading to fear, embarrassment, denial, depression, revulsion, disgust and social isolation. Innovative use of wound drainage devices may enable better exudate management and reduce the frequency of dressing changes with obvious benefits to patient, carers and practitioners. While the use of topical negative pressure dressings is contraindicated in the presence of a malignant wound, when it is necessary to provide palliative management the practitioner needs to be creative.

Application of a Kerlix™ dressing and use of the Exsudex™ pump at low negative pressure would enable wound drainage of excessive exudate to be achieved for a dying patient whose profusely exuding and malodorous wound would otherwise cause great distress and inhibit

### Key Points

- ▶ Heavily exuding wounds cause discomfort and inhibit healing and are often difficult to manage.
- ▶ Exsudex™ is a wound drainage device which removes excess exudate but maintains a moist wound healing environment.
- ▶ It uses topical negative pressure as either a drainage device or as a therapeutic dressing.
- ▶ The case studies show the effectiveness of the device and the cost savings that can be made by using it.

communication between the patient and their family (Figure 9).

### Conclusion

Heavily exuding wounds of any aetiology cause consternation to the practitioner and distress to the patient. Thorough assessment of the patient by a sufficiently knowledgeable practitioner is essential to ensure that all underlying causes, such as malnutrition, are identified and addressed. In addition, the practitioner should be able to apply a wide range of dressing materials including a wound drainage device where applicable. This necessitates the practitioner being able to identify the cost benefits of such devices and including them within business cases to budget managers. **WUK**

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