

Managing exudate and the key requirements of absorbent dressings

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A degree of moisture is essential for moist wound healing (Winter, 1963) but the ideal level of exudate necessary for healthy uncomplicated healing is not known (Vuolo, 2004). When a wound develops the dermis is disrupted resulting in tissue fluid flowing from an area of high pressure in the tissues to an area of low pressure in the wound and until wound closure there will be a variable flow of exudate from the wound (Vowden and Vowden, 2004). Exudate is a normal component of a wound and should appear as a serous (clear straw coloured) or serous-sanguinous (clear pink) fluid in the wound bed keeping the wound moist and promoting healing (White and Cutting, 2006). The production of wound exudate occurs as a result of vasodilatation during the early inflammatory stage of healing and its production in the acute wound is a normal process of wound healing (White and Cutting, 2006).

Exudate is fluid that filters from the circulatory system into areas of the body that are inflamed and, because exudate is present on the wound surface, it promotes moist wound healing by stimulating growth factor production, matrix metalloproteinases and, macrophages while allowing the migration of fibroblasts (Cutting, 2003).

Normally, the amount of wound exudate decreases over time (Ratdiff, 2009) and an increase should lead the clinician to consider inflammation, infection and limb dependency. However, in chronicity, exudate can also increase over time. In chronic wounds exudate contains a high level of matrix metallo-proteases (MMPs) which can be a significant fac-

tor in delaying wound healing (World Union of Wound Healing Societies (WUWHS), 2007).

A low level of exudate flow can result in drying of the wound and can inhibit the healing process (Dowsett and Newton, 2005) but an unmanaged high level of exudate can cause peri-wound damage (Bishop et al, 2003). Maceration is a white discolouration caused by surface keratocytes becoming over-hydrated (Figure 1). Macerated skin is weaker than non-macerated skin and can become damaged by physical trauma and eroded by proteolytic enzymes in the exudate (Young, 2000; Fletcher, 2002). Skin protectors such as 50:50 ointment, Vaseline or barrier films and creams may be used to prevent this occurring.

Wound exudate poses a significant challenge for clinicians. It is often perceived as undesirable but exudate assists healing (WUWHS, 2007) by:

- ♦ Preventing the wound from drying out
- ♦ Aiding the migration of tissue-repairing cells
- ♦ Providing the essential nutrients for cell metabolism
- ♦ Enabling the diffusion of immune and growth factors
- ♦ Assisting the separation of dead or damaged tissue- autolysis.

It is important to consider the cause of the exudates as this is a significant indicator of how to manage it, i.e. if it is caused by oedema or infection then this needs to be corrected. Exudate is a problem when:

- ♦ The dressing leaks or high frequency of dressing change
- ♦ There are Peri-wound changes such as maceration or skin stripping
- ♦ There is delayed healing
- ♦ There is discomfort or pain
- ♦ There is fluid and electrolyte imbalance owing to protein loss.

Importantly, the effect of exudates on psycho-social issues is recognized (Romanelli et al, 2009). The principles of effective exudates management are:

- ♦ Treat the underlying cause
- ♦ Assess local, systemic, psycho-social and wound-related factors
- ♦ Optimise wound bed by maintaining appropriate moisture
- ♦ Prevent and treat exudate-related problems.

The use of absorbent dressings

There are many factors that influence dressing selection, which should be based upon holistic assessment, physical examination of the patient, past medical history and

ABSTRACT

Tissue viability is a challenging area of care and relates to prevention, healing or managing symptom in a variety of wounds. The annual expenditure on wound care in the NHS is estimated at £2.3–£3.1bn per year, accounting for 3% of NHS spend (Drew et al, 2007). From the initial concept of moist wound healing the application of dressings has been influenced by the level of exudates within a wound. While the production of exudate is a normal part of moist wound healing it is often viewed as undesirable as it can prove difficult to manage for the clinician. This article considers the use of the super-absorbent dressing DryMax Extra. Managing exudates and the key performance requirements of absorbent dressings are considered with an analysis made of the clinical data relating to DryMax Extra.

KEY WORDS

- ♦ Wound healing ♦ Wound bed preparation ♦ Debridement

Figure 1. Maceration caused by overhydrated keratocytes



wound history. The diagnostic process will determine the cause of the wound, identify factors that may delay healing, assess the status of the wound and help to develop the management plan (European Wound Management Association (EWMA), 2008).

Successful wound management requires a flexible approach to the selection and use of products based upon an understanding of the healing process and knowledge of the properties of the various dressings available. Thomas (2008) advocates the requirements of an ideal dressing with several issues of particular clinical significance. The requirements of an absorbent dressing are:

- ♦ Maintain the wound and the surrounding skin in an optimum state of hydration
- ♦ Effectively contain exudate or cellular debris to prevent the transmission of micro-organisms into or out of the wound
- ♦ Maintain the wound at the optimum temperature and

pH

- ♦ Easy to apply and remove
- ♦ Provides bacterial protection
- ♦ Does not release particles or non-biodegradable fibres into the wound
- ♦ Provides protection to the peri-wound skin from potentially irritant wound exudate and excess moisture
- ♦ Is non-toxic
- ♦ Requires minimal disturbance or replacement
- ♦ Secondary requirements of the 'ideal dressing'– specific wounds
- ♦ Managing exudate allows for the management of MMPs.

Factors to consider in relation to dressing

The following points must be taken into consideration when selecting a dressing:

- ♦ Is the dressing conformable and comfortable?
- ♦ Is it suitable to be left in place for a long duration?
- ♦ Will the dressing prevent leakage between dressing change?
- ♦ Does the peri-wound area need a preventative skin protector?
- ♦ Is it easy to remove?
- ♦ Is it easy to use?
- ♦ Is it cost effective?

DryMax Extra

The British National Formulary (BNF, 2010) identifies three types of dressings that may be used to manage exudates and is according to the level of exudates:

- ♦ For lightly exuding wounds
- ♦ For moderately to heavily exuding wounds
- ♦ For heavily exuding wounds.

DryMax Extra is an absorbent cellulose and polymer dressing and is recommended for heavily exuding wounds. The simple absorptive dressings hold fluid in the dressing until pressure is applied, when they release the fluid which may lead to maceration and poor fluid handling. As with other dressings in this category they should not be applied to lightly exuding wounds as they may cause the wound to become too dry

Several dressings are classified as super-absorbent cellulose and polymer dressing (BNF, 2010) which varies

Table 1. DryMax Extra is available in the following sizes on Logistics and FP10

Description	Size	Product code	Pack	PIP Code	Cost
Super absorbent cellulose and polymer dressing	10cm x 10cm	EME039	10	346 7057	£1.80
Super absorbent cellulose and polymer dressing	20cm x 20cm	EME031	10	346 6968	£4.20
Super absorbent cellulose and polymer dressing	10cm x 20cm	EME030	10	346 6935	£2.38
Super absorbent cellulose and polymer dressing	20cm x 30cm	EME032	10	346 6992	£4.80

significantly in structure and function as well as cost. DryMax Extra (see *Table 1*) is a low profile (slim) dressing that is based on superabsorbent polymers contained inside a propylene cover. The superabsorbent polymers can absorb up to 20 times as much fluid which is several times their own weight. When the wound fluid comes in contact with the superabsorbent polymers it will attach to the polymer chains and form a complex network structure, resulting in visible swelling and gelling. By this process and by its unique construction, DryMax Extra absorbs and retains exudate taken up through the dressing in a vertical wicking process that minimizes the risk of maceration of the peri-wound area. This allows for appropriate management of exudate, the extension of wear time and reduces the need for dressing change. The low adherent contact layer aids the conformability and helps prevent sticking to the wound.

Importantly, the specific design of the DryMax Extra offers excellent absorption capability and combined with retention properties offers a dressing that manages exudate and protects the peri-wound area. Hindhede (2009), and Meuleniére (2009; 2010) state that it can be used under compression. However, caution must be taken to ensure the maximum benefit is derived from the compression. The presence of excessive exudate should remind the clinician to ensure accurate assessment and differential diagnosis with the exclusion of infection, rather than only managing the exudate.

DryMax Extra is available from Aspen Medical Europe in the sizes on Logistics and FP10 listed in *Table 1*.

Absorbency data

Absorbency test data provided by an independent Swedish laboratory indicates that absorption capacity is similar to the market leader and fluid retention and absorption under pressure is superior. The data also indicates DryMax Extra will potentially keep the peri-wound area dryer than the market leader, although less absorbent dressings with different wound contact layers achieve this more effectively. The data is listed in *Table 2*.

DryMax Extra should be used on exuding wounds where there is a need for high absorption and fewer dressing changes and may be used as both a primary and secondary dressing. The dressing will absorb from either side thereby eliminating the possibility of applying the wrong side to the patient. Care should be taken not to reach saturation as this may lead to damage of the peri-wound area and may lead to the development of maceration.

Dressing selection should give consideration to the sizes available and an appropriate size selected and the dressing must not be cut and should not be used on dry or low exuding wounds, eyes, mucous membranes, tendons or in wound cavities as the dressing swells during absorption.

The dressing should not be used on anyone with a known sensitivity to the dressing or its components. Clinical use of DryMax Extra is in all heavily exuding wounds including leg ulcers, decubitus ulcers and the

Table 2. Test undertaken on a Dry Max Extra 20cm x 30cm

Test	Result
The absorbent capacity under pressure	g/cm ² =1.3
Fluid retention	g/cm ² =1.6
Rewet- liquid spreading (measures the moisture on the surface of the dressing)	1.0g

diabetic foot. Further information can be found on the manufacturers' (website www.absorbtest.se).

DryMax Extra literature review

Meuleniére (2009) reports 15 clinical case studies including pressure ulceration (n=3), skin tear (n=2), venous ulcer (n=9), mixed aetiology leg ulcer, stagnant wound following skin transplant, skin transplant to circumferential ulcer, traumatic wound, dehiscent wound, arterial ulceration (n=3) lymphatic ulcer, ulcer caused by herpes zoster, post vascular surgery wound, post-injection abscess site wound, trauma leading to lymphorrhoea, chronic wound after open ankle fracture, and a patient with haematoma (n=2). Meuleniére (2009) reports successful exudate management and that this contributed to a reduction in infection. Also reported is the ability to manage MMPs, protection of the peri-wound area, the prevention of over-granulation, conformability, reduction in dressing changes, pain control, protection of skin tear, protection of epithelial tissue, reduction of the dressing's ability not to adhere to the wound.

Meuleniére (2010) reported a 92-patient study at EWMA 2010 which included patients with acute traumatic, post-operative wounds and chronic wounds including leg ulcers and pressure ulcers. Analysis including exudates management, the development of granulation and epithelial tissue, peri-wound protection, wearer comfort and pain level. The absorption capacity is noted and also the reduction in wound oedema and hypergranulation.

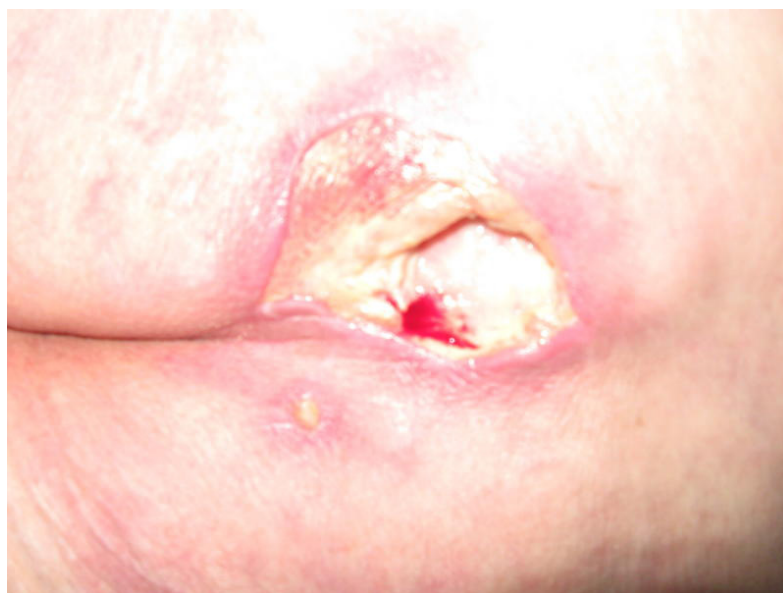


Figure 2: Case Study 1

Figure 3. Case Study 3



Figure 4. Case Study 3



Key points

- ♦ The assessment and classification of stage of wound healing is important and influences appropriate dressing selection.
- ♦ DryMax Extra is a sterile super-absorbent dressing for use on exuding wounds.
- ♦ Exudate has the potential to damage the peri-wound area and requires active management.
- ♦ The super-absorbent properties of DryMax Extra allows the health professional the potential to extend periods between dressing changes on patients with a moderate to heavily exuding wound.
- ♦ DryMax Extra has been used on a variety of acute and chronic wounds including traumatic wounds and meets the remit of many key performance requirements of dressings.
- ♦ DryMax Extra offers the clinician a clinically and cost-effective option and is listed in many wound management formularies in the UK.

Case study 1: grade 3 pressure ulcer

A female aged 79 years with a grade 3 pressure ulcer on the Liverpool care pathway. Area on sacrum previously requiring twice daily dressing change and some leaking. DryMax Extra applied and dressing lasted for over 24 hours, with dressings applied over the next four days until the patient passed away.

Case study 2: post-surgical abdominal wound

A male aged 64 with a post-surgical abdominal wound being cared for in primary care which requires re-hospitalization for further investigation. Wound leaking a very high level of exudates and necessitated three visits daily from community staff. The DryMax Extra was applied and lasted for 24 hours between dressing changes until the patient was re-admitted 6 days later.

Case study 3

Mrs Jones age 72 years has mixed aetiology ulceration, unsuitable for compression therapy because of other co-morbidities. DryMax extra applied for 3 days when improvement noted. Image shows the value of exudates management with reduced wound size, protection of the peri-wound area and overall improvement of skin.

Summary

The management of exudates poses the clinician with a challenge and there are a number of highly absorbent dressings available within the BNF category of highly-absorbent dressing (BNF, 2009). It is essential for the health professionals to select appropriately with consideration to the desired clinical outcome of exudate management, protection of the peri-wound area and reducing frequency of dressing changes. The high absorption capacity allows the clinician to maximize wear time and to reduce the need for dressing changes, thereby reducing the number of times the wound is disturbed, while protecting the peri-wound area.

Successful exudate management can reduce time to healing, prevent exudate-related issues, increase the patients' quality of life and improve health-care efficiency. Appropriate use of this dressing will allow for a greater spend when this is necessary. Several factors influence inclusion in a wound management formulary and the inclusion of a highly absorbent dressing that can be utilised to assist the clinician in managing exudates and offers the health professional a dressing that is clinically and cost effective.

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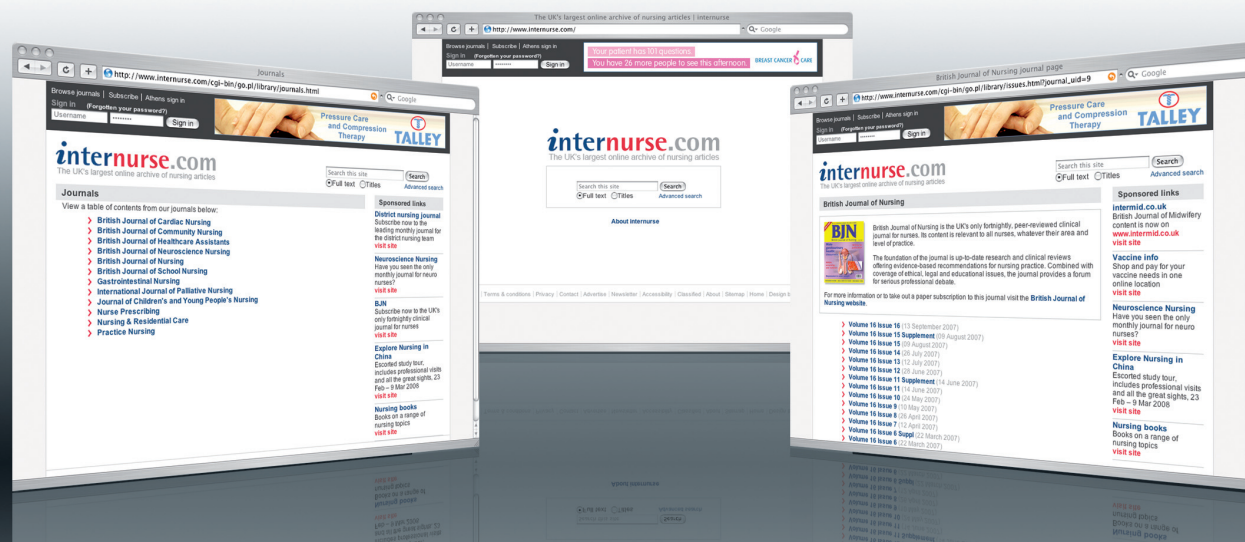
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