

Barrier products: Effective use of a barrier cream and film

KEY WORDS

- ▶ Barrier cream
- ▶ Barrier film
- ▶ Derma-S

There are various threats to the skin's integrity with the most damaging being exudate, faecal or urinary incontinence, and the removal of adhesive dressings from friable skin. This article presents six case studies that highlight the importance of selecting the correct barrier product as part of a co-ordinated treatment plan, in order to effectively manage erythema, excoriation, maceration, and pain in vulnerable patients.

Maintaining patients' skin integrity is one of the essential roles of a nurse. The main atraumatic threats to the skin's integrity include prolonged exposure to exudate from chronic wounds; faecal or urinary incontinence; and the impact of the removal of adhesive dressings from friable skin. Skin barrier products have been developed to minimise damage to the skin by protecting it from bodily fluids (Coutts et al, 2001). In this article the factors associated with moisture-related skin damage and strategies to protect the integrity of the skin will be discussed, and a case series using Derma-S barrier products will be presented.

WOUND EXUDATE

Exudate, particularly from chronic wounds, contains not only water, but often cellular debris and enzymes (Chen and Rogers, 1992). This combination can be corrosive to the intact skin surrounding the wound (Coutts et al, 2001). Several studies have examined the impact of chronic wound fluid on the wound environment.

Phillips et al (1998) used cultured fibroblasts from human neonate foreskins in a plated laboratory model and treated them with either chronic wound fluid or a control fluid (bovine serum albumin). The researchers found that chronic wound fluid dramatically inhibited the growth of fibroblasts, suggesting that the wound microenvironment can have a negative effect on healing and itself lead to further tissue breakdown.

Trengrove et al (1999) found differences in the levels of matrix metalloproteases (MMPs) in chronic wounds as compared with acute wounds. In a further study, Trengrove et al (2000) identified that chronic wound fluid also

contained higher levels of pro-inflammatory cytokines, free oxygen radicals, and proteases, such as MMPs and elastase.

Exposure to MMPs can cause the breakdown of the extracellular matrix and the periwound area as proteins enveloping the corneocytes are destroyed, thus damaging epidermal barrier function (Langoen and Bianchi, 2012). Additionally, pro-inflammatory cytokines in chronic wound fluid damage the stratum corneum, further compromising the skin as a barrier (Wolcott et al, 2008).

DRESSING ADHERENCE

Adherence of dressing materials to the wound bed and periwound skin can damage newly forming cells, and cause the patient pain and distress, during dressing changes. Dykes and Heggie (2003) found that repeated application and removal of adhesive dressings can strip the stratum corneum, initiating inflammation, oedema, and pain (Langoen and Lawton, 2009). Although this type of damage can occur at any age, skin loses most of its resilience as it ages (Cooper et al, 2008), placing older people at increased risk of skin damage (Bianchi and Gray, 2011). Pre-term infants also have fragile skin, which is susceptible to trauma, has poor barrier properties, and is vulnerable to infection (Van Onselen, 2001). Other variables include skin pathology, properties of the adhesive used, and frequency of tape or dressing removal (Fluhr et al, 2002).

INCONTINENCE

Faecal incontinence is a common and debilitating condition with prevalence varying between

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care settings. The reported prevalence of faecal incontinence is 18% to 33% in patients in acute/critical care settings (Bliss et al, 2005; Junkin et al, 2005). In a long-term care hospital, the prevalence of faecal incontinence was reported to be 46% (Borrie and Davidson, 1992), and between 40% and 75% in residential and nursing homes (Bale et al, 2004; Bliss et al, 2005).

Moisture lesions, moisture ulcers, perineal dermatitis, diaper dermatitis, and incontinence-associated dermatitis all refer to skin damage caused by excessive moisture exposure (Ousey, 2012) and are potential consequences of faecal incontinence. Nix (2002) suggested that incontinence-associated dermatitis develops in one-third of those who are faecally incontinent. Furthermore, faecal incontinence can cause the rapid deterioration of exposed skin, with Bliss et al (2006) reporting onset of incontinence-associated dermatitis at between 6 and 42 days (median, 13 days) after the onset of faecal incontinence.

SKIN INTEGRITY: CURRENT TREATMENT STRATEGIES

Early identification of tissue damage is essential to avoid further deterioration and poor outcomes. Clinicians need to have a good understanding of the causes of, and appropriate treatments for, skin damage, or seek referral to appropriate services (Bianchi, 2012).

Periwound damage due to wound exudate

If the wound is producing high levels of exudate, several factors should be taken into consideration. These include:

- *Infection.* A high, or increased, level of exudate may indicate wound infection. The exudate may be malodorous and can be the first indication of infection, thus assessment for local and systemic signs of infections should be undertaken (Dealey, 2006). Where a clinical diagnosis of infection has been made, antibiotic therapy and antiseptic dressings should be initiated
- *Oedema.* Venous disease, lymphoedema, cardiac failure, and prolonged immobility can lead to oedema, particularly in the lower leg (Williams and Moritmer, 2007).

Patients with oedema and wounds may experience increased wound exudate levels due to fluid overload. Compression is an effective method of controlling wound exudate in patients with venous disease as it reduces venous hypertension (SIGN, 2010). Patients with lymphoedema will also benefit from compression therapy (Lymphoedema Framework, 2006).

Treatment strategies for patients with incontinence

Fluids associated with urinary and faecal incontinence place the exposed skin at risk of damage. The strategies suggested for the management of patients with incontinence include:

- *Regular skin inspection.* All areas susceptible to urine and faeces should be inspected, with particular attention paid to the perineal area, the anal cleft, between the thighs, any skin folds, and the buttocks (Bianchi, 2012a)
- *Use of appropriate skin cleansers.* Skin cleansers with an acidic pH that do not need to be rinsed off the skin will help to maintain the skin's acid mantle and help prevent skin damage (Cooper et al, 2008). Thus traditional soap and water should be avoided due to its alkalinity (Bianchi, 2012a)
- *Avoid rubbing and friction during drying.* Air drying of the skin is preferable (Farage et al, 2007)
- *Use of barrier creams and films.* Barrier creams and films form a layer that protect the skin during episodes of incontinence (Beldon, 2008)
- *Use of incontinence pads.* Super-absorbent, breathable pads should be used to draw moisture away from the skin (Farage et al, 2007). Faecal management systems may also be considered (Bianchi, 2012b).

THE DERMA-S RANGE OF BARRIER PRODUCTS

A new range of barrier products has been developed to prevent skin damage. The Derma-S (Medicareplus International) products include a barrier cream and a barrier film.

Dykes et al (2012) evaluated the durability and effectiveness of Derma-S Barrier Film and

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Figure 1. Ms S' Category III sacral pressure ulcer (a) at presentation, and (b) following 2 days of treatment.

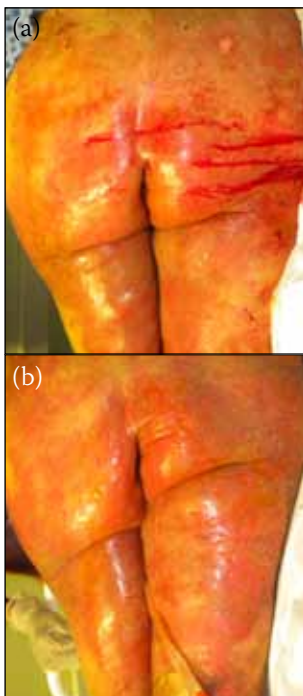


Figure 2. Mrs B's skin (a) at presentation, and (b) following 2 days of treatment including Derma-S Barrier Film.

Cavilon™ Durable Barrier Film (3M). The study involved 11 healthy volunteers who had a film dressing applied to their lower back, which had been pre-stained with water-soluble red dye. The volunteers also had a control area where the dye was applied without the film dressing. The disappearance of red dye from the skin was taken as an indication of the protective effect of the barrier product. The skin was examined using a chromameter 20 minutes after application on days 1–7, inclusive. At each reading, the barrier films had higher readings (more dye remaining) than the control area. The researchers concluded that both film products had a protective effect on delaying the removal of the stratum corneum.

Derma-S Barrier Cream can be applied to damaged skin to form a protective, transparent coating. It does not affect the adhesion of dressings. Only a small amount should be applied to the affected area of skin. It quickly absorbs into the skin with gentle massage. Both 2-g sachets and 90-g tubes are available.

Derma-S Barrier Film was developed to protect skin from harmful bodily fluids and adhesives. This product can also be applied to damaged skin and is quick drying. It is available in different formats, including aerosol, wipes, and applicators.

CLINICAL EVALUATIONS

In addition to scientific experiments, clinical evaluations are of value in that they provide clinicians with practical information on patients who may present with similar health issues to those encountered in everyday clinical practice. The following series of case studies demonstrate how the use of the Derma-S range of skin barrier products can quickly improve the condition of skin exposed to incontinence, and prevent further skin breakdown.

Case 1

Ms S, a 48-year-old woman, was admitted to hospital with urosepsis. She was obese, had poorly controlled type 2 diabetes, and spina bifida. Due to her spina bifida, Ms S was faecally incontinent and had a Category III pressure ulcer on the sacrum. The periwound skin was extremely friable following long-term use of

adhesive dressings that were causing bleeding following removal (*Figure 1a*).

Antibiotic therapy was commenced to treat the urosepsis. A Waterlow risk assessment was undertaken (score, 28) and indicated that Ms S was at risk of developing further pressure ulcers. Prevention strategies were implemented, including the use of a pressure-redistributing mattress and a 2–3 hourly repositioning regimen.

Moist wound dressings were used to manage the existing pressure ulcer, and Derma-S Barrier Film was initiated for the protection of Ms S' surrounding skin. The treatment plan was to wash and dry Ms S' sacrum, apply Derma-S Barrier Film, and then apply the adhesive dressings to the wound.

The periwound skin was assessed 2 days later (*Figure 1b*) and the condition of the skin was found to have greatly improved. Additionally, there was no further bleeding on dressing removal and the patient did not experience pain on dressing removal.

The nurses treating Ms S reported that the Derma-S Barrier Film was easy to use, quick drying, and improved adhesion of the dressing. Due to the early positive results, the treatment plan for the periwound skin was maintained.

Case 2

Mrs B, a 78-year-old woman, was admitted to hospital with acute renal failure. She had a long-standing history of rheumatoid arthritis. She had both faecal (3–4 times a day) and urinary (5–6 times a day) incontinence. A urinary catheter was placed, but loss of sphincter tone made a faecal management system inappropriate.

Mrs B had experienced an adverse reaction to antibiotic therapy resulting in generalised desquamation. A Category III pressure ulcer to her right heel, as well as severe and extensive maceration, erythema, and bleeding in the sacral and posterior thigh area (*Figure 2a*) were present at admission. No pressure ulcer had developed, but a Waterlow risk assessment generated a score of 27, indicating high risk of pressure ulcer development.

The treatment plan included the introduction of a pressure-redistributing mattress, frequent repositioning, a high-protein diet, and wound



Figure 3. Mrs H's sacral skin (a) at presentation, and (b) following 4 weeks of treatment.



Figure 4. Mrs N's dehiscent surgical wound (a) at presentation, and (b) following 4 weeks of treatment.

management for her heel ulcer. The sacral maceration was to be gently washed using warm water and an emollient and Derma-S Barrier Cream to be applied.

When reviewed 2 days later, Mrs B's sacral skin was somewhat improved; the erythema was settling, and bleeding areas reduced. A final assessment was carried out 4 days later (*Figure 2b*) revealed continued improvement with no further bleeding.

Mrs B was comfortable on application of Derma-S Barrier Cream and did not experience any stinging. The nurses treating Mrs B reported that Derma-S Barrier Cream was easy to use and dried quickly after application.

Case 3

Mrs H, a 72-year-old woman residing in a care home, had a history of arthritis resulting in poor mobility. A prior stroke had left her with no apparent bilateral weakness, but she was incontinent of urine several times a day and faeces approximately once a day. Catheterisation was recommended, but the patient declined. Her diet was poor. Her sitting balance was also poor and, as a result, she was only able to sit up for around 45 minutes before tiring. A Waterlow risk assessment indicated she was at high risk of developing a pressure ulcer.

Mrs H was reviewed by the tissue viability specialist due to skin damage to the sacral area. The skin was erythematous, excoriating, and painful, with evidence of skin stripping (*Figure 3a*). A treatment plan was developed that included cleansing and rinsing the skin after each episode of incontinence, followed by the application of Derma-S Barrier Cream to protect the sacral area and prevent further skin stripping.

At 1-week follow-up, Mrs H's sacral skin was less inflamed. She also reported that she found Derma-S Cream to be soothing on application. The patient's sacral area continued to improve during weeks 2 and 3.

On the final assessment at week 4, Mrs H reported that the discomfort in her sacral area had gone. Her skin was much improved, with no sign of excoriation, and erythema gradually subsiding (*Figure 3b*).

Throughout the 4-week period, the nurses treating Mrs H reported that they found the Derma-S Barrier Cream easy to use, and acceptable in terms of drying time. One nurse commented that "a little [Derma-S Barrier Cream] goes a long way".

Case 4

Mrs N, a 69-year-old woman with diverticular disease, was being cared for in a rehabilitation unit following bowel resection surgery to remove a cancerous growth. Following surgery, her wound dehisced and topical negative wound therapy was used to close the wound, but the periwound skin had become excoriating with evidence of skin stripping (*Figure 4a*).

The tissue viability specialist recommended gentle cleansing, followed by application of Derma-S Barrier Film to the periwound skin to protect it from further damage. The wound was then dressed with a hydrofibre dressing with a foam secondary dressing with an adhesive border.

On examination a week after commencement of this regimen, the periwound area was less erythematous. The patient did not have any pain on application of Derma-S Barrier Film and the nurses reported that the adhesive dressing stayed in place.

During weeks 2 and 3 the positive response continued and, due to the enhanced adhesion of the secondary dressing, Mrs N's rehabilitation went well and she felt confident enough to mobilise in preparation for her return to her own home.

By week 4, the wound was continuing to heal, and the periwound skin was intact with no signs of erythema (*Figure 4b*).

Throughout the assessment period, the nurses reported the Derma-S Barrier Film was easy to use, drying time was acceptable, and adhesion of dressings was enhanced.

Case 5

Mrs B, a 72-year-old woman who was resident in a nursing home, was admitted following a stroke. Mrs B had a necrotic pressure ulcer (ungradable due to necrotic tissue) to the sacral area (*Figure 5a*). She was immobile, incontinent of urine several times a day, and faeces

approximately once daily, and her nutritional status was poor. A Waterlow assessment revealed she was at high risk of further pressure ulcer development (score, 38).

On examination of the sacral area the periwound skin was erythematous, excoriated, and painful. The treatment plan developed included gentle cleansing of the wound area, the application of Derma-S Barrier Film to the periwound skin, and a dressing regimen to encourage debridement of necrotic tissue.

She was also assessed and fitted with correct incontinence pads.

Following a week of treatment, Mrs B's periwound skin was less inflamed and the patient found the area to be less painful. Improvement continued in weeks 2 and 3.

At the final assessment (week 4) the periwound skin remained intact (*Figure 5b*) and Mrs B's clinicians commented that Derma-S Barrier Film was easy to use and that improvement of the periwound skin was rapid and sustained.

Case 6

Mrs R, an 84-year-old woman with osteoarthritis and type 2 diabetes, sustained a fracture to the vertebrae. She had been fitted with a collar to stabilise the fracture but, due to immobility, a pressure ulcer had developed at the back of her head (*Figure 6a*), which was not detected immediately as it was hidden under the patient's hair line.

While the periwound skin was intact, the treatment regimen for the pressure ulcer included a pressure-relieving cushion and application of a hydrogel dressing to keep the exposed bone moist. As this treatment donates fluid, a management goal was to protect the periwound skin from over-exposure to moisture.

The tissue viability specialist considered use of Derma-S Barrier Film to the area of concern but, due to hair growth, felt a film would be impractical and instead recommended the use of Derma-S Barrier Cream at each dressing change.

The periwound skin remained intact

throughout the 4-week assessment period and the dressings stayed in place well. The nurses were pleased with the performance of the product throughout the course of the treatment, noting it was the first time they had used a cream instead of a film when treating this type of wound and found it easy to apply in an area of heavy hair growth.

SUMMARY

In this case series, the use of a barrier product in two formulations reduced erythema, excoriation, maceration, and pain in a range of cases of skin damage or wounding. Case 6 also demonstrates effective use of the barrier product to avoid periwound breakdown. In all six cases, clinicians rated the Derma-S products as either as good as or better than the products they usually used.

CONCLUSION

Many patients are vulnerable to skin damage. Careful inspection of the skin and early intervention of prevention strategies are essential to protect intact but at-risk skin from further breakdown and poor outcomes. Barrier creams and films form an important element of the clinicians toolkit for the protection of skin at risk from exposure to incontinence, wound fluids, and adhesive dressing removal. **WUK**

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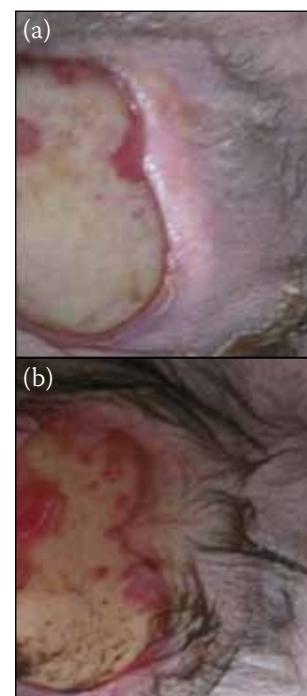


Figure 6. Mrs R's scalp pressure ulcer (a) at presentation, and (b) following 4 weeks of treatment.



Figure 5. Mrs B's necrotic pressure ulcer (a) at presentation, and (b) following 4 weeks of treatment.

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