

Preventing skin breakdown with barrier films and creams

The skin provides a barrier that protects the body from damage from the outside world, be it from bacteria, corrosive elements or foreign bodies. Skin barrier films and creams are widely used to protect the skin from maceration or mechanical damage. This study followed 92 patients with vulnerable skin through a maximum of five days' consecutive treatment with either a no-sting barrier film (n=74) or a barrier cream (n=18). The results demonstrated positive changes in the appearance of the protected areas of skin. This article also provides practice guidance for the use of barrier films and creams.

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KEY WORDS

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One of the key functions of the skin is to act as a physical barrier that prevents fluid, bacteria and other foreign bodies from entering the deeper tissues of the body. Evidence has demonstrated how this physical barrier can be compromised in a variety of ways (Black, 2007), ranging from changes in the strength of the skin over time, mechanical abrasion and contact with body fluids. These body fluids, including wound exudate, urine and faeces, can corrode or macerate the stratum corneum, the outer layer of the epidermis.

Where maceration of intact or periwound skin is a possibility, an appropriate barrier product may be required (European Pressure Ulcer Advisory Panel [EPUAP]/National Pressure Ulcer Advisory Panel [NPUAP], 2009).

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This article examines the impact of skin changes over time and the outcomes of prolonged contact between the skin and corrosive body fluids. The ideal properties of skin barrier products are also highlighted.

Background

The mechanical ability of the skin to withstand tearing and other damage varies between individuals (Beldon, 2006). For example, the skin of people

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who have been taking systemic or topical corticosteroids for extended periods can become thinner and the dermal/epidermal junction weaker. This can cause the epidermis to separate from the dermis (Radley and Shaw, 2008), resulting in the skin tears that are prevalent in this patient population (Lloyd-Jones, 2009).

The skin also weakens naturally as it ages (Cooper et al, 2006). Therefore, the elderly are susceptible to wounds resulting from external trauma such as abrasion or direct pressure and shear. For example, pressure ulcers located on the heel are often caused by friction

between the skin and support surfaces, and similar damage is often seen in the contralateral limb of amputees (Springett and White, 2003).

Acute wound exudate contains growth factors which induce cell proliferation and are viewed as an essential ingredient of the healing process (Adderley, 2010). However, chronic wound exudate contains elevated levels of pro-inflammatory cytokines and matrix metalloproteinases (MMPs) that are destructive and can delay the healing process (Thomas, 2010). Where chronic wound exudate comes into contact with the periwound skin, it can corrode the stratum corneum. Once breached, the skin provides a portal of entry for bacteria, especially the commensal species such as *Staphylococcus aureus* that typically live on intact skin.

Maceration can be painful and if the source remains in contact with the skin, for example where a saturated dressing is left unchanged, the pain can develop into a constant burning sensation (World Union of Wound Healing Societies [WUWHS], 2007). Containment of wound exudate is, therefore, a priority and is often achieved through the use of an adhesive dressing, which seals the wound and contains the exudate, preventing the wound bed from drying out. However, adhesives can



Figure 1. Incontinence-associated dermatitis (IAD).

compromise already fragile skin and cause skin stripping on removal (Cutting, 2008). The use of adhesives represent a risk/benefit decision, with the benefit of exudate containment being weighed against the potential damage caused on removal.

However, in clinical practice this type of skin trauma is not solely wound-related — leakage from fistulae, sinuses and stomas (including ileostomies, jejunostomies, urostomies, tracheostomies and percutaneous endoscopic gastrostomy [PEG] tubes) can cause similar damage. It is essential, therefore, to provide a barrier between the adhesive dressing or leakage and the vulnerable epidermis. The barrier must not contain any alcohol, which itself may cause pain when applied to broken skin. In extreme cases, frequent applications of the barrier product may be necessary, therefore, cost is an important consideration.

Exudate is not the only substance produced by the body that can damage intact skin — urine is also capable of causing maceration when left in prolonged contact with skin, for example, on the area surrounding a suprapubic catheter entry site. This type of damage can be confused with pressure ulcers and in the past moisture lesions have even been listed as category 2 pressure ulcers (Beeckman et al, 2009).

The term incontinence-associated dermatitis (IAD) is now used for any skin damage caused by urine (Beeckman et al, 2009) (Figure 1). IAD is a painful condition that can be exacerbated by the friction experienced when the skin is being cleansed of urine and faeces (Bale,

2006). A barrier that prevents urine coming into direct contact with the skin is an essential element of skin care for these individuals.

Certain wound types are typically very painful, for example, dry or wet desquamation, especially during radiotherapy treatment where the skin is subject to injury from the X-rays (previously this type of skin damage was called a radiotherapy burn, however, they are now known as radiotherapy reactions). Even the slightest touch can cause pain, therefore, a barrier product that can be sprayed onto the skin may be beneficial.

Superficial wounds that only result in loss of the epidermis require a covering to allow for re-epithelialisation. In these cases, the use of a wound dressing may be inappropriate when all that is required is a light covering such as that provided by a barrier preparation. A similar situation may arise in surgical wounds that are being left to heal by primary intention. These wounds produce little or no exudate, but do require protection from contamination and mechanical damage, especially during bathing and showering where a waterproof skin barrier may be helpful. It is also important to use a transparent barrier during the first 48 hours postoperatively to enable the healthcare professional to monitor changes in the wound, such as inflammation. If the inflammation does not start to subside after 48 hours or begins to extend, this may indicate the presence of bacteria, which can prolong the inflammatory phase. A flexible barrier product may be of advantage given the swelling within the skin around the surgical wound that may occur in the first 48 hours postoperatively.

Skin barrier products

Skin barrier products are manufactured as films or creams and the appropriate use of both is highlighted in Table 1. Table 2 highlights one manufacturer's (Aspen Medical Europe) recommended use of barrier films and creams. When considering barrier products,

the duration of their barrier effect is important — ideally, one application should protect the skin for over 24 hours to prevent the need for frequent application (Zeher et al, 2004).

Skin barrier films

Deakin et al (2010) describe the use of one barrier film, Sorbaderm No-Sting Barrier Film (Aspen Medical Europe) in the care of 13 patients with *Clostridium difficile* or norovirus. At the outset of the five-day evaluation, eight of the patients had inflamed skin, four had evidence of maceration and one had broken skin. At the end of the evaluation, changes in the appearance of the patients' skin were noted in the areas covered with barrier film, and, although three patients' skin remained inflamed and one still showed maceration, the other nine all presented with healthy skin.

Deakin et al (2010) outline the three formats in which Sorbaderm No-Sting Barrier Film is available (a 28ml spray and a 1ml and 3ml applicator), as well as highlighting its indications for use and application. Deakin et al (2010) note the following properties of Sorbaderm No-Sting Barrier Film:

- ▶▶ Provides up to 72 hours of skin protection
- ▶▶ Transparent
- ▶▶ Does not contain alcohol
- ▶▶ Contains an acrylate copolymer to enhance the flexibility of the film
- ▶▶ Non-cytotoxic (does not cause cell death or reductions in cell viability)
- ▶▶ Waterproof
- ▶▶ High moisture vapour transmission rate.

The use of an acrylate copolymer to provide flexibility is worthy of note as it negates the need for an additional component, known as a plasticiser, often used to help 'soften' films and plastics (i.e. polyvinyl chloride). In this regard, Sorbaderm No-Sting Barrier Film provides a unique and modern chemical composition.

While there may be differences in the interpretation of clinical evaluations, for example, some observers might not agree on the definitions of 'healthy',

'inflamed', 'macerated' and 'broken' skin, they can provide initial support for the role of a product in clinical practice. This evaluation has been extended across a number of acute care locations to develop a larger sample of patients receiving Sorbaderm No-Sting Barrier Film while also introducing a skin barrier cream.

Extended evaluation

Between 13 April and 26 July, 2010, the author's team collected data on 74 patients using Sorbaderm No-Sting Barrier Film either as a 28ml spray (n=35), 1ml applicator (n=16) or 3ml applicator (n=2) (in the remaining 21 cases the application format was unreported, illustrating the challenge for researchers in gathering complete data when dependent only upon the goodwill of NHS staff).

Each patient was followed for five consecutive days. The appearance of the skin where the Sorbaderm No-Sting Barrier Film had been applied was recorded. Sorbaderm No-Sting Barrier Film was primarily applied to the sacrum (n=21), buttocks (n=16), or groin and peri-anal area (n=10), but in single cases was also applied under the breasts, lower leg, inner thigh, hand and behind the ear.

At the outset of the evaluations, 14 of the patients had healthy skin, eight macerated skin, 32 inflamed skin and 21 broken skin. In 14 cases the skin was reported to be dry and nine cases had unspecified manifestations of skin damage. Many subjects experienced multiple presentations, for example broken and inflamed areas of skin.

Of the 74 patients, 33 were treated with Sorbaderm No-Sting Barrier Film for three or fewer days, 25 were treated for four days and 16 completed all five days (in this article, only data from patients who completed four or more days use of the barrier film have been reported). By day four, five subjects were reported to have healthy skin, 10 broken skin, 16 were still inflamed and only three macerated. Eleven people were reported to have either dry or unspecified skin changes

Table 1

Appropriate use of skin barrier films and creams

Skin barrier film

- | | |
|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ▶▶ Protection of peri-ulcer skin from exudate | ▶▶ Protection of vulnerable skin from skin stripping from tape and adhesive dressings |
| ▶▶ Protection of peristomy skin from digestive juices and urine | ▶▶ Protection of vulnerable skin from skin tears |
| ▶▶ Protection of peri-tracheotomy skin from saliva | ▶▶ Covering of closed surgical incisions |
| ▶▶ Protection of peri-PEG tube skin from digestive juices | ▶▶ Covering of moist desquamation |
| ▶▶ Protection of buttocks, perineum and inner thighs from urine and associated-incontinence dermatitis | ▶▶ Protection of buttocks and perineum from faeces |
| ▶▶ Protection of buttocks and perineum from faeces | ▶▶ Covering of wounds with loss of epidermis only |
| ▶▶ Protection of skin folds from perspiration | |

Skin barrier cream

- | | |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| ▶▶ Moisturising, and protection of dry skin | ▶▶ Moisturising, and protection of dry desquamation |
| ▶▶ Moisturising, and protection of varicose eczema and eczema craquele | ▶▶ Moisturising, and protection of skin that is subsequently covered with an adhesive dressing |

respectively (once again, many subjects were reported to have experienced multiple skin changes in the area protected by Sorbaderm No-Sting Barrier Film). There was also a reduced number of people reported to have broken or inflamed skin under the barrier film.

As part of the evaluation, clinicians reported their opinions of Sorbaderm No-Sting Barrier Film compared with alternative barrier products. Sorbaderm No-Sting Barrier Film reportedly achieved better or similar improvements in skin appearance in 55/56 completed cases, better or similar comfort to the patient in 53/55 cases, and the ease of application was considered to be better or similar in 51/56 cases. Pain on application was rarely reported (5/44 completed forms noted pain on application), while 38/41 clinicians would use Sorbaderm No-Sting Barrier Film again.

Skin barrier creams

Skin barrier creams are a concentrated medium that protect dry, chafed, red or irritated skin (*Figure 2*) by providing moisture and a long-lasting barrier. Sorbaderm Barrier Cream (Aspen Medical Europe) does not prevent adhesive products from sticking to the skin and is supplied as a 2g sachet and a 92g flip-top tube. Sorbaderm Barrier Cream has the following benefits:

- ▶▶ Prevents skin damage associated with incontinence
- ▶▶ Moisturises the skin
- ▶▶ Provides an efficient barrier against bodily fluids
- ▶▶ Does not impede wound dressing adhesion after application
- ▶▶ Is pH balanced
- ▶▶ Is highly concentrated
- ▶▶ Stays in place and is not easily washed off
- ▶▶ Does not clog underwear or nappies
- ▶▶ Does not contain petrolatum

Table 2

Barrier film and cream application guide

Skin condition	Risk factors	Primary treatment focus	Secondary treatment focus	Treatment choice
Normal intact skin	Dry skin Elderly skin Oedema Faecal and or urinary incontinence Peristomal and periwound care	Preventing moisture	Protection from risk factors	Barrier cream
Erythema or moderate dermatitis with no broken skin	Dry skin Elderly skin Oedema Faecal and or urinary incontinence Peristomal and periwound care	Protection from further damage	Prevention (maintain moisture balance)	Barrier cream (when dry skin) No-Sting Barrier film (when moist skin)
Broken, severe dermatitis Excoriated weeping skin Pressure ulcers grade 2 and 3	Dry skin Elderly skin Oedema Faecal and or urinary incontinence Peristomal and periwound care	Protection from further damage	Prevention (maintain moisture balance)	No-sting barrier film

- ▶▶ Is latex and fragrance-free
- ▶▶ Has a high moisture vapour transmission rate, allowing water (in a gaseous form) to pass through the cream and away from the surface of the skin.

Before application, the area to be treated should be clean and dry. Only a small, pea-sized amount of the skin barrier cream should be used in each application and spread over the entire area (if after application the skin feels oily, too much cream has been applied). The cream only needs to be re-applied after three episodes of incontinence, but it can be also re-applied daily to help treat extremely dry skin.

Initial experience of the skin barrier cream

The author's team applied Sorbaderm Barrier Cream to 18 patients between 2 July and 30 July, 2010. It was applied to the sacrum (n=4) or buttocks

Both the Sorbaderm No-Sting Barrier Film and the Sorbaderm Barrier Cream were considered to be either similar or better than alternative products when it came to ease of application, comfort and eventual clinical outcome.

(n=6), with two people receiving treatment on both their sacrum and buttocks. In the two remaining cases the cream was applied to the natal cleft and a combination of sacrum and inner thigh. In four cases the location was unreported.

At the start of treatment most people were reported to have either inflamed (n=12) or broken skin (n=7), with five noted to have dry

skin (multiple skin descriptions were possible in each patient). The majority of people to whom Sorbaderm Barrier Cream was applied were faecally incontinent (n=13), with seven also reported to be incontinent of urine. Two patients were catheterised.

Ten patients completed the full five-day evaluation and at the end of the audit six still had inflamed skin, five had broken areas and four reported dry skin. Compared with alternative barrier creams, Sorbaderm Barrier Cream was reported to have achieved better or similar improvements in skin appearance, comfort and ease of application in all of the completed cases.

Conclusion

Barrier films and creams offer protection for vulnerable areas of skin. Evaluations of Sorbaderm No-Sting Barrier Film and Sorbaderm Barrier Cream focused on



Figure 2. Dry skin where use of the skin barrier cream would both moisturise and protect the skin.

the sacrum, buttocks and groin. However, skin folds (under breasts or behind the ear) were also protected.

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Key points

- ▶ Barrier films and creams offer protection for vulnerable areas of skin.
- ▶ Evaluations of Sorbaderm No-Sting Barrier Film and Sorbaderm Barrier Cream focused on the sacrum, buttocks and groin.
- ▶ Both the Sorbaderm No-Sting Barrier Film and the Sorbaderm Barrier Cream were considered to be either similar or better than alternative products when it came to ease of application, comfort and eventual clinical outcome.