



# CLINICAL EVALUATION

## THE USE OF SKIN BARRIER FILMS IN PATIENTS WITH MOISTURE LESIONS

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A clinical guide to tissue damage associated with excessive moisture and evaluation of the use of LBF® No Sting Barrier Film using a case-study approach.

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Wounds UK  
Enterprise House  
1-2 Hatfields  
London SE1 9PG, UK  
Tel: + 44 (0)20 7627 1510  
Fax: +44 (0)20 7627 1570  
www.wounds-uk.com



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**ABOUT THIS DOCUMENT**

The damage due to excessive moisture on the skin, whether from acute or chronic wound exudate, urinary or faecal incontinence or perspiration, can be considerable and in severe cases, can result in the development of a moisture lesion. They cause pain, discomfort and are distressing. It is important for clinicians to diagnose correctly and treat locally the cause of skin damage as well as promote appropriate strategies to keep patients' skin healthy. The use of a barrier film can protect the skin and enable the healthcare professional to provide comprehensive care for the patient.

This document reviews tissue damage associated with excessive moisture and evaluates the use of LBF® No Sting Barrier Film (CliniMed Ltd) through a number of case studies.

# UNDERSTANDING MOISTURE LESIONS

## Author details:

Pauline Beldon, Tissue Viability Nurse Consultant, Epsom & St Helier University Hospitals NHS Trust, Sutton, Surrey

## INTRODUCTION

While the burden of chronic wounds such as pressure ulcers, diabetic foot ulcers and leg ulcers, as well as acute surgical wounds, has been well documented (Posnett et al, 2009), there are no such records for the prevalence and incidence of moisture-related skin damage in either the hospital or community setting. Although the incidence of incontinence is estimated to be 50% of residents in long-term care facilities in the UK (Durrant and Snape, 2003), it is impossible to assume that all those with incontinence are at risk from developing moisture lesions. There is now a need to establish the prevalence of moisture lesions in different care settings as this will assist in the development of a strategy and allocation of resources to tackle the problem and help drive improvements in the quality of patient care.

## WHAT ARE MOISTURE LESIONS?

There are many terms used to describe moisture-induced skin damage (Beeckman et al, 2009). The most common term applied to damage caused by moisture such as exudate, faeces and urine or perspiration is a moisture lesion.

When the skin comes into contact with any of these substances, the cells in the outer layer of the epidermis swell and absorb fluid. This causes the skin to become damp, soggy and eventually saturated. Prolonged exposure to moisture causes the skin to become increasingly permeable, making it weaker and less elastic. Maceration results from the overhydration of keratinocytes leading to a white moist appearance, which if not managed effectively may lead to breakdown of the skin, possibly extending the size of a wound or creating new moisture lesions (Thompson and Stephen-Haynes, 2007). In addition, the presence of proteolytic enzymes within wound fluid or digestive enzymes in urine or faeces can chemically degrade exposed skin, resulting in a red (excoriated), weeping surface (Thomas, 2008).

Moisture lesions are often misclassified as pressure ulcers (DeFloor et al, 2005) and it is therefore important to differentiate between moisture-related damage and other types of tissue damage, such as that caused by pressure. The key to these differences lies in the location, shape and depth of the damage (Ousey et al, 2012).

## FACTORS CONTRIBUTING TO SKIN BREAKDOWN

There are a number of changes that occur as the skin ages, making it more vulnerable to damage due to trauma or excessive moisture (BPS, 2012). In the older person, there is an estimated 20% reduction in the thickness of the dermis, resulting in the paper-thin, almost translucent appearance of elderly skin (Haroun, 2003). This is associated with a reduction of blood vessels, nerve endings and elastin and changes in collagen (Baranoski and Ayello, 2004). In addition, the fat cells within the subcutaneous tissue are metabolically less active, with thinning of the protective fat layer (Flour, 2009). The diminished number of sweat glands and reduced sebum production also make it difficult to keep the skin well lubricated and can lead to dryness and itching (Watkins, 2011).

Other causes of vulnerable skin include:

- Ultra-violet radiation damage in individuals who have over exposed their skin to the sun can lead to skin changes and a much higher propensity to develop basal cell cancer
- Radiotherapy treatment to specific body areas can increase the risk of skin damage and delay healing in patients with a wound
- Genetic disorders, such as Epidermolysis bullosa, where the slightest friction can lead to severe blistering
- Dermatological conditions, such as Bullous pemphigoid, where the dermo-epidermal junction is disrupted leading to blistering of the skin (Flour, 2009).

Barrier film products have been available for almost a decade and have provided a much needed advance in the protection of vulnerable skin, susceptible to the detrimental effects of excessive moisture.

# ROLE OF SKIN BARRIER FILMS

Skin barrier films are topical preparations (available as a spray, foam applicator or wipe). Films can be applied to broken or irritated skin without stinging, and dry quickly to create a breathable and transparent film. They provide a protective water-repellent barrier against irritants and harmful bodily substances, such as urine and faeces. Barrier films will not affect the application of adhesive dressings and tapes and are simple for both healthcare providers and patients/carers to use.

It is important to use a skin barrier film to protect the skin when indicated. In addition, good practice recommends that practitioners should:

- Assess the individual's skin daily
- Minimise skin exposure to moisture (e.g. through absorbent dressings, incontinence pads and faecal management devices)
- Cleanse the skin using a pH-balanced cleanser, avoiding use of soap and hot water, and pat dry
- Consider the use of emollients to maintain skin hydration and integrity.

Reapplication and use should be in accordance with the individual manufacturer's instructions.

## BENEFITS OF USING LBF® NO STING BARRIER FILM

- Low allergy potential
- Easy to apply
- Low risk of cross infection
- Economical
- Safe

## LBF® NO STING BARRIER FILM

This is an alcohol-free and latex-, fragrance- and preservative-free, silicone-based film, which gives conformability over the skin in addition to protection against excessive moisture. The film is fast-drying, creating a breathable and transparent barrier on the skin.

The LBF® barrier film range is intended as a primary barrier to protect the patient's skin from the corrosive effects of urine, faeces and wound exudate. It will also protect against adhesives and friction, facilitating the safe application of appliances such as stoma pouches and other devices to the skin.

It is available as a spray or foam applicator and can be applied without the need to touch the skin directly. The barrier function is long-lasting, which may mean that fewer repeat applications are needed, helping to make this an economical and cost-effective product.

The LBF® No Sting Barrier Film Spray uses an innovative bag-on-valve technology, which is effectively a one way system. This allows the film to be applied uniformly to skin and prevents air or particles being sucked back into the bag within the canister, reducing the risk of cross infection. The space between the canister and the bag is filled with compressed nitrogen, which forces the LBF® fluid out of the bag when the spray button is pressed down. This avoids the need for propellants that are harmful to the environment and means that there is no cold sensation when the spray is applied, which is typically caused by the evaporation of any residual propellant on the skin.

The LBF® Sterile No Sting Barrier Film Foam Applicator is an individually packaged applicator for single use on broken or intact skin. The 1ml applicators are sterile and can be used to apply the film to the periwound skin or stoma site.

The LBF® product range also includes a barrier cream which can be applied as a breathable layer that also moisturises the skin while providing a protective barrier for intact skin from bodily fluids such as faeces and urine (Fletcher, 2012).



For further information about LBF® No Sting Barrier Film go to: <http://www.clinimed.co.uk/Wound-Care.aspx>

# HOW TO MANAGE MOISTURE-RELATED SKIN DAMAGE

## MOISTURE-RELATED SKIN DAMAGE

### Perspiration

Sweat is produced by the body when infection is present in order to regulate the body's temperature. Increased perspiration can also be due to nursing a patient on a pressure-relieving mattress; the heat from the mattress against the legs, buttocks and back may lead to the patient feeling damp, increasing the risk of damage from friction or shear and possible pressure damage (Clarke and Black, 2011). Obese patients have a tendency to perspire profusely due to the increased volume of adipose tissue, which prevents heat loss and increases the body mass ratio (Rush, 2009).

Obese and bariatric patients also have an increased risk of intertrigo, with skin rashes developing under skin folds where moisture can accumulate as a consequence of increased perspiration (Fig 1). It is essential that skin folds are kept clean and dry and checked regularly (Rush, 2009). The use of a barrier film applied following routine cleansing may help to protect skin folds from moisture-related damage, shear and friction.



**Fig 1.** Skin appearance under the abdominal apron. The patient is recovering from an episode of intertrigo caused by perspiration and poor hygiene.

### Wound exudate

Exudate plays an essential role in the normal healing process by preventing desiccation of the wound bed and assisting re-epithelialisation (WUWHS, 2007). However, problematic acute wounds and some chronic wounds may produce large volumes of exudate. Increased levels of exudate may be due to size and location of the wound, oedema, infection, or an underlying comorbidity such as venous hypertension, lymphoedema or a fungating wound (Gardner, 2012). If a highly exuding wound is not managed appropriately the wound bed can become overhydrated, causing moisture to leak out onto the periwound skin and leading to maceration (Cutting and White, 2002). In addition, enzymes associated with chronic wounds may cause skin stripping or excoriation (Gardner, 2012).

Exudate-associated leakage together with malodour and pain can be distressing for patients. If not managed effectively, exudate-related problems may lead to poor patient concordance due to a loss of confidence in the treatment. The aims of management for highly exuding wounds include:

- absorption of exudate
- reduction of bacterial count
- avoidance of periwound maceration (Gardner, 2012).

The use of a barrier film applied to the periwound skin can be invaluable as part of a regimen for managing the highly exuding wound by helping to minimise skin contact with exudate (see Case 1, page 4).

## CASE 1: PERIWOUND MACERATION: VASCULITIC ULCER

Contributed by: Helen Strapp, Tissue Viability Clinical Nurse Specialist, AMNCH Tallaght Hospital, Dublin, Ireland

### BACKGROUND

This 26-year-old female had been attending the wound management clinic for treatment of a leg ulcer on her right leg, which was thought to be due to Pyoderma gangrenosum. The diagnosis was subsequently changed to vasculitis, which required admission to hospital for treatment. During a follow-up visit to the outpatient dressing clinic, the skin surrounding the ulcer appeared red and sore due to exudate from the wound and there was evidence of maceration at the wound edges (Fig 1).

### TREATMENT

It was decided to use a barrier film (LBF® Sterile No Sting Barrier Film Foam Applicator) to protect the surrounding skin. First, the skin was washed with an emollient (Emulsiderm®, Dermal Laboratories). The barrier film was applied using the foam applicator. The sloughy area of the wound was dressed with a cadexomer iodine paste (Iodoflex™, Smith & Nephew). A low-adherent wound contact layer (Mepitel®, Molnlycke Healthcare) was then applied together with a cohesive inelastic compression bandage system (Actico®, Activa Healthcare). The patient was fully mobile. Dressing changes were performed twice a week.

**Week 1:** At review the condition of the skin had improved slightly, with less redness and the patient reported that it felt 'a little better' (Fig 2). She did not report any stinging and discomfort and it was decided to continue with LBF® Sterile No Sting Barrier Film Foam Applicator for a further week using the same treatment regimen.

**Week 2:** A week later, the skin appeared red again (Fig 3). However, as dressing changes were only performed twice weekly and there had been some improvement, it was decided to continue the treatment regimen for a further week.

**Week 3:** At review three weeks after the start of treatment with LBF® Sterile No Sting Barrier Film Foam Applicator, the condition of the skin had improved and was less red (Fig 4). The patient said that it felt better and the product provided comfort. It was decided to continue the patient on the current treatment regimen. The nurses found the foam applicator very easy to use and although the periwound skin still appeared red after the first two applications, the product did improve the patient's comfort level.



Fig 1. At the start of treatment with LBF® Sterile No Sting Barrier Film Foam Applicator.



Fig 2. One week after the start of treatment showing slight improvement in the condition of the surrounding skin.



Fig 3. Two weeks after the start of treatment the surrounding skin was still red, although the patient reported improved comfort levels.



Fig 4. Three weeks after the start of treatment. The surrounding skin appears 'pink'.



**Fig 2.** Moisture lesions due to urinary and faecal incontinence. Note the lesions are not well defined, are superficial and located in the peri-anal area.

### Incontinence

Urine and faeces pose a danger to vulnerable skin, especially in the older person. Moisture lesions, moisture ulcers, perineal dermatitis, diaper dermatitis and incontinence associated dermatitis (IAD) all refer to skin damage caused by excessive moisture due to urine and/or faecal incontinence (Ousey et al, 2012).

Where urine and/or faeces are in regular, direct contact with the skin, the skin becomes soggy, saturated and vulnerable to friction and shearing forces (Beeckman et al, 2009). If the outer layer of the skin is also attacked by lipolytic and proteolytic enzymes from loose stools, the physical strength of the stratum corneum is compromised and results in skin erosion (Beeckman et al, 2009) (Fig 2). The situation may be compounded by an increase of the normal acidic pH of the skin, due to the alkalinity of urine and faeces combined (BPS, 2012). This can encourage bacterial colonisation with the potential threat of a secondary infection (Beldon, 2008). If the skin remains unprotected and the continence issues unresolved, the patient has an increased risk of developing associated pressure damage.

The management of incontinence requires individual assessment of the causes of the problem. The skin of patients with incontinence is sensitive and should be protected from urine and faeces. Consideration should be given to the use of urinary and faecal collection systems to protect skin integrity (Ousey et al, 2012). It is important to avoid cleansing the skin with traditional soap and water following episodes of incontinence and use foam cleansers as part of a cleansing regimen. A barrier film can be used to act as a barrier against further irritation from incontinence (BPS, 2012).

It must also be noted that many patients with IAD are very vulnerable to pressure damage and may have mixed damage due to pressure and IAD combined. In these cases, the provision of appropriate pressure-redistributing equipment is an essential element of the planned care (Fletcher, 2012).

## CASE 2: INCONTINENCE ASSOCIATED DERMATITIS (IAD) DUE TO FAECAL INCONTINENCE

### BACKGROUND

Mr W was a blind, 89-year-old gentleman with multiple comorbidities, including an above left knee amputation, hypertension and several transient ischaemic attacks. He was admitted with diarrhoea of unknown cause and was incontinent of faeces. His perineum and sacrum had become painful due to IAD.

### TREATMENT

LBF® No Sting Barrier Film Spray was selected to provide a moisture barrier during incontinence episodes. This was applied following each episode. The spray dried quickly and the patient reported no discomfort on application. After three days of treatment, the patient reported that the skin was no longer painful. He was able to sit up once more, enabling him to eat his meals more easily. Treatment continued for two weeks in total with evidence of a significant improvement in the patient's skin condition (Fig 2).



**Fig 1.** Mr W's skin prior to application of LBF® No Sting Barrier Film Spray.



**Fig 2.** Mr W's skin after two weeks' treatment.

## CASE 3: TISSUE DAMAGE DUE TO FAECAL INCONTINENCE

### BACKGROUND

Mrs B was a 78-year-old lady who had been admitted to hospital with end-stage respiratory failure. She was a frail lady and unable to move independently due to advanced chronic obstructive pulmonary disease (COPD).

Mrs B was incontinent of loose stool, induced by antibiotic therapy, and was at risk of developing incontinence associated dermatitis (IAD). The patient's skin was excoriated, prone to bleeding, with open areas in the perianal area, which were extremely painful. Due to her breathing difficulties she preferred to be nursed upright and, despite the use of an appropriate pressure-relieving mattress, there was an increased risk of pressure ulcer development.

### TREATMENT

After cleansing with an incontinence wipe to remove faecal matter, LBF® No Sting Barrier Film Spray was selected to protect the damaged skin. This was repeated after each episode of incontinence to provide a protective barrier from moisture damage and to help progress healing. The patient's risk of developing a pressure ulcer was very high (Waterlow score of 27).

At an assessment four days later, the skin was much calmer with less erythema and some of the open areas had healed, despite still passing loose stools. The nursing staff reported that the spray application was easy to use, with a good drying time and the patient did not report any discomfort or stinging. The plan was to continue using the barrier film spray. However, the patient died two days later due to her respiratory illness.



Fig 1. Mrs B's skin, prior to the application of LBF® No Sting Barrier Film Spray.



Fig 2. Four days following initiation of LBF® No Sting Barrier Film Spray.

# OTHER USES FOR SKIN BARRIER FILMS

Other factors affecting skin breakdown include malignancy, radiation and adverse drug reactions. Preventive practices include washing with soap substitutes, a no-friction drying technique, and the use of emollients and/or a skin barrier as part of a planned skin care programme.

The impact of skin conditions on quality of life and wellbeing can be considerable. This factor needs to be taken into account when assessing patient needs and their response to treatment (Penzer et al, 2010). For some patients, a reduction in pain and discomfort may be the primary consideration where healing is a secondary outcome.

## Skin protection during larval therapy

Larval therapy (also known as maggot therapy or biosurgery) is used to debride sloughy or necrotic tissue (Anderson, 2010). Larvae produce proteolytic enzymes that allow them to break down and digest the necrotic tissue; a secondary mode of action is that of homogenisation, which is the movement of the larvae across a wound bed (Turkmen et al, 2010). To protect the periwound skin from the harmful larvae secretions, it is recommended that clinicians use a barrier product or zinc paste to minimise the risk of the patient developing a pruritus (Anderson, 2010).

The use of a barrier film (LBF® Sterile No Sting Barrier Film Foam Applicator) was evaluated in a patient undergoing larval therapy who had a known allergy to the skin barrier product supplied with the larvae (Case 4).

## CASE 4: PROTECTION OF PERIWOUND SKIN DURING LARVAL THERAPY

### BACKGROUND

Mrs G was a 64 year-old lady with diabetes, who underwent an open reduction and internal fixation for a fractured ankle. Following surgery, the wound on the lateral malleolar dehisced due to infection and became sloughy. The orthopaedic surgeon was reluctant to perform a surgical debridement and sought the opinion of a tissue viability nurse, who suggested larval therapy would be more sparing of viable tissue.

### TREATMENT

Prior to application of the bagged larvae, LBF® No Sting Barrier Film was applied to the periwound skin using the foam applicator to help with accuracy (Fig. 1).

At follow up four days later, the LBF® No Sting Barrier Film Foam Applicator had protected the patient's skin successfully from the harmful larvae secretions. The patient reported no discomfort.



Fig 1. Right lateral malleolar wound prior to the application of larval therapy. The periwound erythema is due to the infection.



Fig 2. Post-application of larvae. The florid redness has faded and the open lesions have almost healed.

### Skin damage due to radiotherapy

Radiation dermatitis is a common side effect of radiotherapy treatment and can range from a mild rash to dermal ulceration. Acute radiation dermatitis can cause intense itching, discomfort, pain and anxiety, which can negatively impact on a patient's quality of life. A variety of topical treatments have been recommended (Salvo et al, 2010) following a systematic review of treatments according to the severity of the radiation dermatitis, including Aloe Vera gel, steroid ointment, and a hydrogel or hydrocolloid dressing. Chamomile cream, almond ointment and topical vitamin C are not recommended and are considered ineffective (Wickline, 2007).

To evaluate the use of a barrier film, LBF® No Sting Barrier Film Spray was applied to a superficial radiation burn in a patient who had undergone radiotherapy for his prostate cancer (Case 5).

### CASE 5: RADIATION BURN

The patient's radiation burn to the peri-anal area was very painful and it restricted his ability to sit, causing him distress with feelings of loss of independence. Prior to the use of LBF® No Sting Barrier Film Spray, the patient's skin was washed with water and the skin patted dry. The barrier film was used to protect the vulnerable skin and to reduce his level of discomfort. However, the patient deteriorated suddenly and was transferred to a hospice. The staff at the hospice continued with the treatment regimen and reported that his skin condition had improved greatly and the open areas healed within four days.



Fig 1. Prior to application of LBF® No Sting Barrier Film Spray.

### CONCLUSION

Healthcare professionals often use barrier films for patients with moisture-related skin problems, whether due to incontinence or wound exudate. However, barrier films, in particular LBF® No Sting Barrier Film, can also be used to protect vulnerable skin, helping to prevent tissue damage from occurring. Where a lesion has been caused by moisture it is important to control urinary and faecal incontinence and where a lesion is the result of damage from wound exudate then it is important to use appropriate dressings to manage the exudate. In all cases, the protection of the skin using a suitable barrier product is essential. In addition, barrier films may be used to protect the skin during larval therapy and post-radiotherapy to help protect it from the local environment.

It is important patients are regularly assessed to identify problems early. Early detection of the causes of skin maceration should be considered and steps taken to prevent skin breakdown. As well as an estimation of wound exudate (WUWHS, 2007), assessment should include the causes of incontinence or copious perspiration secondary to sepsis and associated pyrexia. Preventative care using a barrier film can both protect the skin and prevent moisture-related skin damage. This can help reduce the incidence of moisture lesions, driving down the overall costs of wound care, while increasing the quality of care.

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