

## Innovations in care of the skin surrounding pressure ulcers



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When attempting to manage a pressure ulcer it is easy to focus attention on the wound while overlooking the periwound area. However, although managing vulnerable periwound skin presents the clinician with a set of unique challenges, effective treatment can prevent unnecessary skin breakdown. This article examines management techniques, including pressure relief, the use of barrier creams and exudate control.

### Page points

1. Distinguishing between a pressure ulcer and other forms of skin damage can be difficult
2. It is important to identify whether a lesion is a pressure ulcer or a moisture lesion as they require different treatment
3. Continued relief of pressure is the most effective way to reduce skin damage

### References

1. Langoen A, Lawton S. Dermatological problems and periwound skin. *World Wide Wounds* 2009. Available at: <http://www.worldwidewounds.com/2009/November/Lawton-Langoen/vulnerable-skin-3.html> (accessed 7 July, 2010).
2. International Review. Pressure ulcer prevention: pressure, shear, friction and microclimate in context. A consensus document. London: Wounds International 2010: <http://www.woundsinternational.com> (accessed 7 July, 2010).
3. Defloor T, Schoonhoven L, Fletcher J, et al. Statement of the European Pressure Ulcer Advisory Panel – pressure ulcer classification. Differentiation between pressure ulcers and moisture lesions. *J Wound Ostomy Continence Nurs* 2005; 32(5):302-6.

### INTRODUCTION

Pressure ulcers can result in extensive damage to tissues, cause pain and negatively affect a patient's quality of life. Clinicians must recognise that the skin surrounding a pressure ulcer is also vulnerable and needs careful assessment and management<sup>[1]</sup>.

### PRESSURE ULCERS AND SKIN BREAKDOWN

Pressure, shear and friction can all result in occlusion of the arterial circulation in the dermis. When pressure is relieved and the area is reperfused, the circulatory system can overcompensate for the recent lack of oxygen and the area of skin affected can become hyperaemic. The cycle of obstructed circulation and reperfusion results in an increase in reactive oxygen species in the tissues, causing inflammation (the skin becomes red).

Where the damage is permanent, the area will remain red even with the application of pressure – this is known as non-blanchable erythema and indicates that there is a persistent inflammation in the skin resulting in the development of a stage 1 pressure ulcer. This inflammation, coupled with reduced circulation, can also make the periwound tissue more vulnerable.

A recent innovation in relation to pressure ulcer pathophysiology and skin integrity is new clarity in the understanding of role of microclimate in the context of pressure ulcers. This has been explored in an international consensus document, which states that 'excessive skin moisture and high relative humidity weaken skin and increase the likelihood of damage from pressure, shear and friction'. The document asserts that efforts should be made to control extreme

temperature or skin moisture and provides a number of practical suggestions<sup>[2]</sup>.

### PRESSURE ULCERS AND MOISTURE LESIONS

It is sometimes difficult to distinguish the difference between a superficial pressure ulcer and other forms of skin damage. This includes skin damage caused by skin conditions such as incontinence-associated dermatitis. Incontinence-associated dermatitis is one of a number of causes of moisture lesions<sup>[2]</sup>.

It is important to identify whether a lesion is a pressure ulcer or a moisture lesion in order to provide the correct treatment. If the lesion has been caused by moisture it is important to control urinary and faecal incontinence; if the lesion has primarily been caused by pressure offloading is key; and if the lesion is a result of damage from wound exudate then dressing procedures targeted at effective exudate management are an important priority. In all cases, the protection of the skin with emollients, zinc paste and protectors are essential (see below). *Table 1* details the main differences between pressure ulcers and moisture lesions<sup>[3]</sup>.

### PROTECTING THE PERIWOUND SKIN

#### Pressure relief

Continued relief of pressure is the most effective way to reduce damage to the skin. Indeed, all other skin-preserving techniques will be ineffective if the inflammation caused by pressure, shear and friction is not alleviated.

It is important to note that some older pressure-relieving mattresses alternate between providing complete relief from

pressure and relatively high pressures. Equipment that delivers a constant rate of low pressure is often desirable.

**Exudate control**

Wound exudate from chronic wounds including pressure ulcers contains damaging proteases known as matrix metalloproteinases (MMPs)<sup>[3]</sup>. These proteolytic enzymes can dissolve the epidermis, reducing the barrier function of the skin. In order to maintain the condition of the periwound skin, it is important where possible to treat the cause of any exudate and contain it by using appropriate dressings or if indicated negative pressure wound therapy<sup>[4]</sup>. Foam dressings are often the chosen regime for heavily exuding wounds and can be combined with absorbers like Hydrofiber™ (ConvaTec) or alginate dressings<sup>[5]</sup>.

If the wound is infected, it is important to adopt strategies that will reduce bacterial load and manage biofilms<sup>[6]</sup>. This includes regular and appropriate debridement. Clinicians may also consider using antimicrobials such as silver dressings, honey dressings or pastes, iodine dressings or pastes, and polyhexamethylene biguanide (PHMB)<sup>[6]</sup>.

**Barrier creams**

The periwound skin needs to be protected from wound exudate, urine and faeces as these contain corrosive elements, which can destroy the barrier function of the skin.

Barrier creams containing 50% soft white paraffin and 50% liquid paraffin and pastes containing zinc oxide are a good way to achieve this<sup>[7]</sup>. Barrier creams provide a thin barrier layer between the skin and irritants like lipase, protease, ammonia and soap, preventing these skin-damaging elements

from accessing the intra-epidermal fat and the keratin of the stratum corneum.

However, care must be taken to avoid excessive use of these products. Evaporation of water from the skin is called trans epidermal water loss (TEWL). If the barrier product is applied too thickly, moisture cannot escape and the skin can become macerated. The barrier function of the skin is compromised as a result.

When correctly applied, barrier creams can protect the periwound skin from the corrosive effects of sweat, moisture, exudate, urine and faeces, as well as any trauma from bed linen<sup>[8]</sup>.

**Reducing skin pH**

A low pH is part of the skin's protective function (also called the acid mantle) and primarily helps protect against bacteria and fungal growth. On different parts of the body, the skin's pH varies between 5 and 7. The upper part of the chest and back, where there is greater production of sebum, is where the pH is lowest; while the intertriginous areas (groin; armpit) have the highest pH.

By reducing the skin pH the damaging effects of both lipases and proteases can be minimised. An emollient for example with a pH of between 4.5 and 5.5<sup>[4]</sup> will help to neutralise the effect of the skin-dissolving enzymes.

**Skin protectors**

Commercial skin protectors are products designed to provide a barrier between the skin and any potential irritants. They are manufactured in different forms, such as creams, sprays, or wipes and are meant to provide a 'breathing' layer, which lets TEWL out, while preventing wound fluid, urine and faeces from coming into contact with the skin. They can be used to protect the skin around pressure ulcers. However, it is important to

**Page points**

1. Wound exudate from chronic wounds such as pressure ulcers contains proteases that can damage the periwound skin
2. The periwound area also needs to be protected from urine and faeces as both contain corrosive elements that can penetrate the skin's barrier function

**References**

4. WUWHS. *Principles of best practice: wound exudate and the role of dressings. A consensus document.* London, MEP Ltd, 2007. Available at: <http://www.woundsinternational.com> (accessed 6 July, 2010).
5. Thomas, S. The role of dressings in the treatment of moisture-related skin damage. *World Wide Wounds* 2008. Available at: <http://www.worldwidewounds.com/2008/march/Thomas/Maceration-and-the-role-of-dressings.html> (accessed 7 July, 2010)
6. Phillips PL, Wolcott RD, Fletcher J, Schultz GS. Biofilms made easy. *Wounds International* 2010; 1(3). Available at: [www.woundsinternational.com](http://www.woundsinternational.com) (accessed 7 July, 2010).
7. Romanelli M, Romanelli P. Dermatological aspects of leg ulcers. In: Morison MJ, Moffatt CJ, Franks PJ (Eds). *Leg Ulcers. A Problem-based Learning Approach.* London: Mosby Elsevier, 2007.
8. Gray M, Weir D. Prevention and treatment of moisture-associated skin damage (maceration) in the periwound skin. *J Wound Ostomy Continence Nurs* 2007; 34(2): 153-7.

	PRESSURE ULCER	MOISTURE LESION
<b>Causes</b>	Pressure/shear	Moisture is present, eg shining wet
<b>Location</b>	Bony prominences	Skin folds, anal cleft (sharp edge), perianal area
<b>Shape</b>	One spot, circular wounds	Diffuse superficial spots, 'kissing' ulcers
<b>Depth</b>	Grade 3 and 4 are deeper than moisture wounds	Superficial wounds (infection)
<b>Necrosis</b>	Black necrosis	No necrosis
<b>Edges</b>	Distinct edges	Diffuse edges and irregular lesions
<b>Colour</b>	Non-blanchable erythema, necrosis and slough	Red but not uniformly distributed, pink or white surrounding skin

Table 1 – The differences between a pressure ulcer and a moisture lesion<sup>[3]</sup>

## Further reading

Sussman G. Technology update: Understanding film dressings

EWMA Position Document: Topical negative pressure in wound management

International review: Pressure ulcer prevention: pressure, shear, friction and microclimate in context

## Useful links

3M Healthcare

B Braun

ConvaTec

Lohmann & Rauscher

Smith & Nephew

Read the text-based version of this article

## References

1. Watkins J. Fungal infections in the elderly: *Candida Albicans*. Nursing and Residential Care 1999; 1(7): 414-6.
2. Williams C. 3M Cavilon No Sting Barrier Film in the protection of vulnerable skin. Br J Nurs 1998; 7(10): 613-5.
3. Williams C. 3M Cavilon Durable Barrier Cream in skin problem management. Br J Nurs 2001; 10(7): 469-72.

ensure that the product used does not result in maceration. Skin protectors that contain acrylate and silicone are also water-repellent. Zinc oxide, silicone and acrylate skin protectors keep irritants from coming into contact with the skin. However, they also influence the TEWL. Using more than one product can further increase the risk of maceration. Therefore products containing zinc oxide and acrylate should not be used at the same time.

## PRACTICE TIPS

If it is difficult to protect the skin surrounding the pressure ulcer using protectors, low pH emollients or wound dressings, a protective layer of hydrocolloids or polyurethane film dressings can be used. Clinicians should clean the periwound skin, apply a protective film (eg Skin-Prep [Smith & Nephew] or Cavilon™ No-Sting Barrier Film [3M]) and a protective dressing. A hole which is the same size and shape as the wound can then be made in this dressing – this provides access to the wound while ensuring the periwound area is protected.

## Urine and faeces

Pressure ulcers in the area around the buttocks are particularly susceptible to periwound damage as the skin is regularly exposed to urine and faeces. It is important to keep the skin clean without using too much soap or other skin

irritants. The skin should then be protected with an emollient or paste containing zinc oxide.

## Trauma damage

Some of the products used in cleansing the skin such as soap, can cause allergic reactions in the periwound skin and products such as tapes and dressings used for wound management can cause trauma and damage surrounding skin when removed. The periwound skin can be cleaned at the same time as the wound using a synthetic skin detergent (low pH soap) and water. The patient's skin and wound can be cleaned by showering and using water at a moderate temperature.

## CONCLUSION

Although protecting vulnerable periwound skin can be challenging, effective management can prevent unnecessary complications and suffering. This article has discussed a number of techniques, including pressure relief, barrier creams and exudate control. However, before any treatment choices are made, it is important that the clinician carries out a comprehensive assessment of the pressure ulcer as this will help to identify the optimum management regimen.

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## Expert Commentary

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*Reddened sacral skin may be caused by pressure damage and/or incontinence. Management includes pressure relief and application of products to protect the skin from further damage. Another cause of reddened skin (which may also be present in combination with pressure damage and incontinence in this area) is Candida. Candida is a parasitic fungal infection caused by a yeast type of fungus called Candida albicans. Candida thrives in warm, moist, damaged skin, particularly if the skin is occluded<sup>11</sup>. The appearance of the skin is red and it may have whitish patches and satellite lesions. The skin will become raw and tender. The elderly and infirm and the immunosuppressed are particularly susceptible.*

*Other risk factors include malignant diseases, uraemia, diabetes and treatment with broad spectrum antibiotics, which eradicate bacteria and allow Candida to thrive. Although infection with Candida (candidiasis) is rarely life threatening it is highly unpleasant and can cause intense itching and soreness. Diagnosis may be made by taking a swab for mycology. It is usually easy to treat with topical anti-fungal creams.*

*Cavilon No-Sting Film® and Cavilon Durable Barrier Cream® (3M) are often used to protect the skin against incontinence damage<sup>2,3</sup>. However, both of these products are occlusive. It is important to rule out the presence of Candida before applying such products that occlude the skin as this may provide an environment in which Candida thrives, thereby worsening the condition.*

**Practice tip:** take a swab for mycology if Candida is suspected and treat with topical anti-fungal cream. Keep area clean and dry. Only apply skin protection products and other occlusive products once the presence of Candida has been excluded.

## Expert Commentary

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Over the past few years there has been growing recognition that not every red area or wound on a patient's bottom is a pressure ulcer<sup>[1]</sup>.

Whilst the treatment of the actual wound may be similar regardless of the cause, it is still important that the underlying aetiology is recognised as this can have a critical impact on the management of the area as a whole. For example, a moisture lesion caused by incontinence-associated dermatitis (IAD) requires different treatment than a pressure ulcer. Counting all incidence of skin damage as one and the same can be detrimental to patient outcomes as well as having financial implications for the health care provider.

In the UK, pressure ulcers are high on the political agenda. They were recently identified as one of only 8 High Impact Actions for Nursing and Midwifery (see Useful Links box) and are one of the areas where the Department of Health has produced a productivity calculator. The 'Your skin matters' chapter of the High Impact Document suggests that pressure ulcers should be seen as 'avoidable adverse events, not an inevitable fact of life'<sup>[2]</sup>.

There is now considerable focus on quantifying the problem of pressure ulcer development and in recent years efforts have been made to clearly define the differences between pressure ulcers and moisture lesions. This makes it all the more infuriating that some hospital trusts which routinely collect pressure ulcer data still do not differentiate between pressure ulcers and IAD and simply lump them all together<sup>[3]</sup>. This sends out a host of poor messages about patient assessment, care delivery, resource usage, nurses' knowledge and the collection of audit data.

Accurate diagnosis of the underlying wound aetiology is vital<sup>[2]</sup>, for example, in the case of IAD, choosing the correct incontinence products is more important than the type of support surface that is used. Similarly, education and training are fundamental to prevention and should include practising good skin assessment and care as well as understanding the difference between different wound types<sup>[4]</sup>. Any breakdown of skin, whatever the cause, needs to be addressed promptly and appropriately to prevent further damage<sup>[5]</sup>.

A recent international consensus document on pressure ulcer prevalence<sup>[6]</sup> (see Useful Links box, page 9) clearly states that correct identification of pressure ulcers underpins all meaningful prevalence studies and that this involves appropriate identification of the wound aetiology, including IAD and other types of moisture lesion. More detailed criteria for differentiating between pressure damage and moisture lesions are described by Defloor et al<sup>[1]</sup>, who suggest the following key diagnostic prompts:

- Cause
- Location
- Shape
- Depth
- Presence of necrosis
- Edges
- Colour.

The National Association of Tissue Viability Nurses (Scotland) (NATVNS) have also produced an easy-to-use pictorial guide on identifying skin excoriation (or IAD) in incontinent patients (see Useful Links box).

Given that such easily accessible resources exist, it is not only disappointing that many clinicians do not routinely differentiate between wound types, it is also inconceivable that some specialist nurses and trusts do not insist on this as best practice.

It is easy to claim that clinicians are unable to differentiate between pressure ulcers and IAD, but a recent study on inter-rater reliability, which assessed 395 patients, concluded that nurses were able to identify moisture lesions<sup>[7]</sup>. The study also stated that because a precise identification of moisture-related wounds is important as the start point for clinical practice, more effort should be put into enhancing diagnostic precision<sup>[7]</sup>.

There are huge costs associated with the prevention and management of both IAD and pressure ulcers and if staff do not know what they are dealing with, how are they supposed to provide appropriate care? This is an area of clinical practice that needs to be urgently addressed.

## Useful links and further reading

High Impact Actions for Nursing and Midwifery

NATVNS – skin excoriation

International guidelines. Pressure ulcer prevention: prevalence and incidence in context

## References

1. Defloor T, Schoonhoven L, Fletcher J, et al. Pressure ulcer classification. Differentiation between pressure ulcers and moisture lesions. EPUAP Review 2005; 6(3): 81–5.
2. NHS Institute for Innovation and Improvement. High Impact Actions for Nursing and Midwifery. 2010; Available at: <http://www.institute.nhs.uk> (accessed 23 July, 2010).
3. Foxley S, Baadjies R. Incontinence associated dermatitis in patients with spinal cord injury. Br J Nurs 2009; 18(12): 719, 721–3.
4. McDonagh D. Moisture lesion or pressure ulcer? A review of the literature. J Wound Care 2008; 17(11): 461–6.
5. Gibbon C. Moisture lesion or pressure ulcer? J Comm Nurs 2009; 23(10): 11–6.
6. International guidelines. Pressure ulcer prevention: prevalence and incidence in context. A consensus document. 2009; London: MEP Ltd.
7. Kottner J, Halfens R. Moisture lesions: interrater agreement and reliability. J Clin Nurs 2010; 19: 716–20.