

MOISTURE LESIONS: THE EFFECT OF URINE AND FAECES ON THE SKIN

Poorly managed urinary and faecal incontinence can have a devastating effect on the skin of an individual regardless of age. In severe cases, the skin can be so badly damaged that a moisture lesion develops — these are painful and require prompt treatment to prevent them growing in size. This article outlines the causes of moisture lesions and details the best practice for their management.

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The incidence of urinary and faecal incontinence is notoriously difficult to ascertain, partly due to under-reporting (Johanson and Lafferty, 1996). Faecal incontinence can affect both genders and is experienced by an estimated 1–2% of the total population. However, the prevalence rises with age and can be as high as 7% in adults aged 65 years or over (Soffer and Hull, 2000). In residential or nursing homes, faecal incontinence can affect as many as one in four individuals (RCN, 1998).

In the case of urinary incontinence, a survey of 6,500 households in the UK revealed a prevalence of 32% in women (Hunskaar et al, 2004). However, the true figure is likely to remain hidden as many adults are embarrassed to admit problems with incontinence and instead attempt to manage the problem independently.

Extensive guidelines have been published in order to aid healthcare professionals in managing individuals with both faecal and urinary incontinence (Scottish Intercollegiate Guidelines Network [SIGN], 2004; National Institute



Figure 1. Incontinence dermatitis; the skin is red, inflamed and painful.

for Health and Clinical Excellence [NICE], 2006; NICE, 2007). It is imperative that these guidelines are consulted by healthcare workers as urinary and faecal incontinence cause misery for thousands

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of individuals and evidence-based best practice can help to ameliorate their problems.

Protection of the normal skin

The skin is the human body's largest organ and it performs a number of complex functions that ensure chemical, physiological and biological well-being (*Table 1*). The

skin's unbroken surface is covered in commensal bacteria and yeast which, along with naturally acidic secretions such as sebum, control the balance and number of bacteria, preventing

Table 1.

Main functions of the skin

- ▶ Storage of subcutaneous fat
- ▶ Protection: keeping internal organs safe by providing a covering of layers of tissue, of which the skin is the outermost
- ▶ Immunity
- ▶ Excretion: perspiration contains water and salts
- ▶ Temperature regulation: responding to cold and heat
- ▶ Reception of stimuli such as pain and pressure
- ▶ Absorption: of drugs and sunlight, which enables the skin to manufacture vitamin D

(Adapted from Tortora and Anagnostakos, 1990)

them from overwhelming the body's defences (Stephen-Haynes and Gibson, 2003).

Sebum is an oily substance produced by the dermal layer of the skin and is secreted through the sebaceous glands — its purpose is to keep the skin supple and waterproof. The epidermis covers the dermis and forms the outer layer of the skin. It is a hardened layer that protects the body from injury through friction and shear during daily living as well as preventing the loss of excessive moisture (Mairis, 1992).

The skin is a generally robust organ, however, it is constantly subjected to the rigours of daily life, including the effects of sunlight, environmental pollution, and frequent washing using soap and detergents, all of which can dry it out and weaken its integrity. Any breach in the skin's integrity, such as a lesion or wound, will weaken its protective function. It is vital to seal any such breach quickly to prevent infection (Timmons, 2006).

Formation of a moisture lesion

The skin's protective secretions, natural oils produced by the sebaceous glands, enable it to maintain a naturally acidic pH, usually between 4.0–5.5 (Berg, 1988). This is often termed the



Figure 2. Moisture lesion formed due to increased skin pH and moisture.

Table 2.

A comparison of pressure ulcers and moisture lesions (Evans and Stephen-Haynes, 2007)

	Likely to indicate a pressure ulcer	Likely to indicate a moisture lesion
Causes	Pressure and/or shear present	Moisture present urine, faeces, sweat and/or exudate
Location	Tends to be over a bony prominence	Lesion limited to natal cleft Wound not over bony prominence Peri-anal erythema and skin irritation
Shape	Limited to one spot Circular or regular shape, with exception of friction damage caused by dragging.	Diffuse — different superficial spots In a 'kissing' shape, at least one wound caused by moisture
Depth	Partial-thickness skin loss — top layer of skin damaged Full-thickness skin loss	Superficial, partial-thickness skin loss
Necrosis	Necrosis	No necrosis in moisture lesion
Edges	Distinct	Irregular
Colour	Red skin; non-blanching	Erythema

'acid mantle' and it is vital that a low or acid pH is maintained in order for the skin to remain intact.

Unfortunately, the pH of the skin rises when it comes into contact with ammonia, which is produced from the breakdown of urinary urea and exacerbated by faecal urease. When the pH of the skin rises it becomes increasingly permeable and this is made worse by the presence of excessive moisture (caused by urine or liquid stool). Eventually, tiny invisible breaches will form on the skin's surface.

Added to this, faeces contains both proteolytic and lipolytic enzymes, which are used during digestion. Normally, these enzymes are deactivated as faeces pass through the digestive tract, however, if the pH of the skin has been raised, this can reactivate the digestive enzymes, causing further skin irritation (Berg, 1988). Skin that has been frequently assaulted by loose faeces can become taut, painful and erythematous, resulting

in incontinence dermatitis (Figure 1) (Keller et al, 1990).

Once the barrier function of the skin has been breached it is far more likely to be attacked by bacteria, leading to the development of a moisture lesion. Sixty per cent of faecal matter consists of bacteria, which includes between 4–500 species of micro-organism (Whitman, 1991). These micro-organisms strip away the epidermal layer, exposing the dermis and forming a lesion in the deeper layers of the skin (Figure 2).

In older people, the skin is drier due to the natural ageing process. The reduction of natural water and fat emulsion on the skin modifies the water/protective barrier of the epidermis (Richey et al, 1988). Consequently, the skin becomes more prone to damage from excessive hydration — if the individual is passing frequent, watery, loose faeces due to acute diarrhoea, this over-hydrates the skin, which causes it to become

more permeable. In addition, excessive hydration renders the skin especially vulnerable to friction and shear forces.

The combination of moisture, friction and shearing, together with bacterial and enzymatic activity on ageing dry skin, will inevitably lead to tissue breakdown without prompt intervention.

Differentiating moisture lesions from pressure ulceration

There is a clear link between incontinence and the formation of pressure ulceration, hence the inclusion of continence status in many pressure ulcer risk assessment tools (Norton et al, 1975; Towney and Erland, 1988; Waterlow, 1988). While it is imperative that healthcare professionals have the necessary knowledge to assess patients that are at risk of pressure damage, it is also important to differentiate between pressure ulceration and the formation of a moisture lesion. The key to these differences lies in the location, shape and depth of the damage (Evans and Stephen-Haynes, 2007) (Table 2).

Healthcare professionals must be very clear that if moisture lesions are not treated correctly, they can worsen and the patient may develop secondary pressure damage or ulceration (Figure 3). Therefore, it is imperative that advice is sought immediately from a specialist practitioner, such as an infection control nurse, tissue viability nurse or continence advisor to ensure the patient receives the best possible care.

Any patient with a pressure ulcer and a moisture lesion will require the use of a faecal management

system to exclude faeces from the wound site; a faecal management system consists of a flexible silicone-coated tubing that is inserted into the rectum and is held in position by inflation of a cuff—the device is similar in nature to a urinary catheter. A pressure-relieving mattress, adequate wound dressings, a diet high in protein and calories, and expert skin care will also be required.

Strict fluid balance monitoring is also vital to ensure the patient does not become dehydrated—this can occur easily in the older frail patient and intravenous fluids may be required.

The causes of acute faecal incontinence

Acute faecal incontinence can occur in many healthcare settings as well as in the home. It is important to differentiate between diarrhoea and impaction with overflow incontinence as the treatment is very different. Impaction with overflow incontinence commonly occurs in older, frail patients with immobility and/or dementia, while diarrhoea is often the result of Crohn's disease, ulcerative colitis, antibiotic therapy or infection (Irwin, 2001). Patients with impaction and overflow require aperients and/or enema to loosen and remove the blockage of solid faeces, while the patient with diarrhoea due to infection or disease should not be given aperients or enema. An abdominal ultrasound scan can reveal whether or not a patient has impaction of faeces in the bowel.

Clostridium difficile

Clostridium difficile is a gram-positive, spore-forming anaerobic bacteria, which is found in a small



Figure 3. Pressure ulceration has formed in the sacral and peri-anal area secondary to a moisture lesion.

proportion of healthy adults. Its normal habitat is the large intestine where it is subdued by the commensal bacteria of the gut. In some patients, especially the elderly and those that are frail due to acute illness, antibiotic therapy has the unfortunate effect of cleaning the gut of 'good' bacteria—this allows the *C. difficile* to flourish, resulting in acute diarrhoea.

C. difficile produces two toxins—A and B. These are the virulent factors responsible for the inflammation, fluid and mucosal damage that leads to diarrhoea or colitis in 3–8% of patients receiving antibiotic therapy, experiencing a prolonged hospital admission or who have become immunocompromised (Adams and Mercer, 2007). Most *C. difficile* infections occur in hospital but they can also occur in the community (Bardsley et al, 2007).

The management of acute faecal incontinence

The loss of bowel control is a particularly devastating problem for an adult to cope with and feelings of embarrassment, shame and depression are not uncommon (Irwin, 2001). Patients need to be treated sensitively and sympathetically.

It is imperative that any patient experiencing acute diarrhoea is

isolated to prevent cross-infection. Stool specimens must be sent to microbiology urgently to determine whether infection with *C. difficile* is the cause (Kiernan, 2007).

If the loose faeces is not contained it will inevitably damage the patient's peri-anal skin, resulting in a moisture lesion. The insertion of a faecal management system will isolate the faeces from the skin and also spare the patient the indignity of experiencing loose diarrhoea.

Before the insertion of a faecal management system, a digital rectal examination (DRE) should be performed by a healthcare professional trained in both DRE and the insertion of faecal management systems – this is to ensure that the patient's anal sphincter is able to hold the device in place. The faecal management system should then be inserted into the rectum and held in place by inflating the balloon cuff with sterile water – this balloon sits above the anal sphincter (Figure 4).

There are currently two faecal management systems available that can take faeces away from the patient's skin, the Flexi-Seal® system (ConvaTec, Ickenham) and the Zassi® system (Hollister, Wokingham).

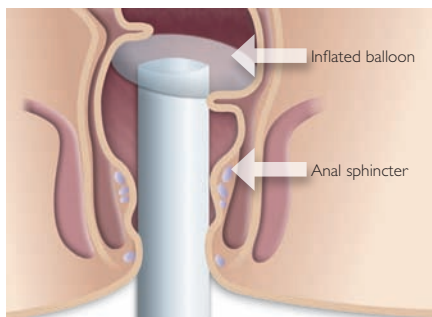


Figure 4. Retention of a faecal management system (Flexi-Seal®).

While faecal management systems are deemed expensive as individual items, the alternative is the continued use of continence pads; these require frequent changing and the patient's skin needs to be cleansed following every episode of diarrhoea. Apart from being expensive in terms of products used and nursing time spent, this traditional method means the patient's skin will inevitably suffer due to continual cleansing and the effects of loose faeces. This is before any risks of cross-infection and prolonged hospital stays are taken into account.

Skin cleansing and protection

In general, it is inadvisable for older people to use soaps – their skin is often already dry due to the consequences of ageing. Soaps are detergents and their purpose is to strip the skin of dirt and grease – unfortunately they can also remove the natural oils of the skin. A soap alternative or a low pH soap is preferable (Le Livre, 2002).

The skin should be washed after every episode of loose stool, again without using soap since most bar soaps have an alkaline pH and are likely to exacerbate any existing dermatitis (Nix, 2000). Plain water can be used provided the healthcare worker ensures the skin is patted rather than rubbed dry as this avoids exposure to further friction (Le Livre, 2002).

No-rinse skin cleansers are available and these can be soothing and effective as they generally contain a gentle, non-irritant surfactant, which helps to loosen faeces and clean the skin. This prevents the need to rub the skin and cause further injury (Scardillo and Aronovitch, 1999).

Protection of the skin using a barrier cream is necessary for some individuals. However, it should be remembered that these creams need to be removed after each episode of incontinence in order to avoid layers of faeces and barrier cream forming close to the skin.

It should also be remembered that with age the skin may also become more sensitive to irritants and many barrier creams contain ingredients such as zinc oxide, dimethicone or lanolin (Beldon, 2007).

Whereas these creams are water-based preparations, ointments are oil-based and offer greater protection because they are more occlusive, effectively 'sealing' the skin (Nix, 2006).

Liquid barrier films are another method and these contain a solvent that dries on contact with the skin, providing a protective barrier. Cavilon™ No-Sting Barrier Film (3M™ Loughborough) is an example. However, these barrier films are not meant to be used on broken skin – rather they should be applied as soon as faecal incontinence is suspected.

Conclusion

Incontinence, especially acute diarrhoea, represents a significant threat to peri-anal skin integrity, which if not managed promptly is likely to lead to the formation of a moisture lesion.

The impact on the patient can be considerable – acute discomfort, pain and embarrassment are common and require sensitivity on the part of the healthcare worker. It is vital that any healthcare worker who is likely to come into contact

with older incontinent adults has some knowledge of the physical properties of the skin and what measures to take in the presence of incontinence. **WE**

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