The importance of maintaining skin integrity is high on both clinical and political agendas, with a key focus on prevention strategies being influenced by several distinct policies and guidelines including patient safety (National Patient Safety Agency (NPSA), 2010), pressure ulcer prevention (National Institute of Health and Clinical Excellence (NICE), 2005), continence care and dermatology (NICE, 2006). The protection and maintenance of skin integrity in those suffering incontinence is a significant challenge. NICE (2006) suggests that clinical problems can be avoided and outcomes significantly improved through the implementation of fundamental aspects of care, including: good continence promotion; incontinence containment; management of incontinence irritants; keeping the skin clean and dry; reducing friction and shear; and the use of a barrier film or cream. Documentation is also important to ensure continuity of care (Nursing and Midwifery Council (NMC), 2009).

In early 2012, the authors conducted a study with 95 patients (n=95) over a 3-month period to investigate the clinical effectiveness of a newly available barrier film and barrier cream. The study involved a wide variety of clinical indications and clinical settings and are published internationally in their entirety (Stephen-Haynes and Stephens, 2012). Of the 95 patients, 25 had incontinence and 3 had a stoma. These results and the implications for clinical practice are presented here to enable a targeted focus for the results according to clinical indication and to critique and contextualise the results for easier implementation into clinical practice.

This article is the first of three that presents these study findings and considers the importance of barrier skin protection in relation to continence care, with part two and three, to be published in the British Journal of Nursing, to focus on skin protection in relation to pressure ulcers and periwound exudate.

**Context**

Human skin is the largest organ of the body (Sibbald et al, 2009) and has a number of physical and biological functions, however, its most significant role is that of a protective barrier to the external environment. The skin is covered with a naturally produced lipid layer, which helps to maintain moisture balance, prevents drying and provides an effective waterproof barrier. Normal skin pH is about 5.5, which significantly reduces the ability of bacteria to proliferate (Butcher and White, 2005). Skin dryness may occur from excessive washing or use of alkaline soaps, which alter the pH of the skin reducing its barrier function (Wysocki, 2000). Bodily fluids, including urine and faeces, can water-log, macerate and corrode the outer layer of the epidermis (stratum corneum) leading to skin breakdown, often painful in nature (Baharestani et al, 2010).

The importance of appropriate skin care and effective skin barrier protection use is growing in response to the increasing elderly population, the naturally occurring changes as their skin ages, and the increasing number of people with health conditions that affect the skin (Gray, 2007). The current national agenda regarding patient safety is supported by the NPSA (2010) with the aim of leading and contributing to improved, safe patient care by informing, supporting and influencing the health sector. One aspect of patient safety is the promotion and maintenance of skin integrity, which is an important role for clinicians in all care settings and must never be under-prioritised.

**Incontinence**

Incontinence is the involuntary loss of control of the bladder, bowel or both. The occurrence of urinary incontinence increases with age; 31% of older women and 25% of older men are affected in the general population (Goode et al, 2005) and between 30% and 80% of residents in nursing homes are incontinent (Bale et al, 2004). Irwin et al (2006) estimate that there are 3–6 million people in the UK with some degree of urinary incontinence. Faecal incontinence incidence also rises with age and around 12% of older people are affected (Goode et al, 2005). Fondata (2005) suggests that a significant number of people are placed in institutional care settings owing to incontinence but the exact figure is unknown.

Importantly, absorbent products, handheld urinals and toileting aids are not a treatment for urinary incontinence and should only be used while awaiting treatment, as an adjunct to ongoing treatment and when all other options have been explored (NICE, 2006). Several interventions for urinary incontinence are outlined in NICE (2006) guidance.

**Maceration and incontinence-associated dermatitis**

If the skin is exposed to excessive levels of moisture for prolonged periods of time...
the excess fluid infiltrates the tissues and presents itself as a ‘white’ waterlogged area known as maceration. The skin is significantly weakened when it becomes macerated and this exacerbates the possibility of further skin damage as a result of pressure, friction or shear. It is well recognised that the level of moisture influences the development of pressure ulcers (European Pressure Ulcer Advisory Panel (EPUAP), 2009). The relationship between age, incontinence-associated dermatitis (IAD) and sacral pressure ulcer development is also well reported (Gray, 2010; Langemo et al, 2011) and many studies have been performed in nursing home settings (Zehrer et al, 2004; Bale et al, 2004; Bale, 2005; Bliss et al, 2005; Bliss et al, 2006; Junkin and Selekof, 2007).

Persistent exposure of the skin to corrosive irritants, such as urine and faeces, if left unmanaged and unprotected will result in the development of extremely painful excoriation or IAD and can lead to more severe secondary tissue infection. Nazarko (2007) states that IAD is often unrecognised and poorly treated.

Beeckman et al (2011) provide clear clinical advice for the prevention and treatment of IAD, including appropriate assessment, gentle cleansing, moisturisation, the application of a skin protectant and moisture balance.

Bardsley (2012) propose that differentiating between pressure ulcers (Figure 1), moisture lesions and IAD should be based on visual examination. The characteristics of IAD differ from those of pressure ulcers in a number of ways, including colour, location, presence of necrotic tissue and exudate production (Gray, 2010).

Principles of good skin care
The principles of skin care are prevention, maintenance and treatment with a focus on appropriate management of incontinence, cleansing, moisturising and the use of an effective skin barrier.

Cleanse
A key consideration when cleansing the skin is that of pH of the product being used. Cooper and Gray (2001) noted that most soaps and cleansers are alkaline with a pH of 9, which alters the natural pH of 5.5 and strip the skin of its natural acid mantle protection. Therefore a pH-balanced, high-emollient skin cleanser is recommended following incontinence of urine and a foam cleanser following faecal incontinence (NICE, 2007).

Moisturise
Well-moisturised, supple skin offers the best form of protection. The moisture content of the skin determines its elasticity, firmness and functionality of the epidermis, if it is too high or too low this will affect the skin’s barrier properties (Bardsley, 2012).

An important consideration when choosing creams as a barrier protectant is that these products lay down a layer of grease to repel moisture rather than provide a protective film barrier. Generic skin protectors include zinc oxide in various bases and paraffin (either white, soft or yellow) (Joint Formulary Committee, 2012). While creams are effective at repelling the moisture, they are commonly over-applied causing ‘clogging’ of incontinence pads, and reduce their absorbency, capacity and effectiveness (Newton and Cameron, 2005; Penzer, 2008).

The clinician should use products as licensed and recommended. Metanium and Drapoline are designed and licensed for nappy rash in babies and are inappropriate for use in older adults (Joint National Formulary, 2012). Caution should be taken with zinc oxide cream, which has a tendency to ‘cake’ on the skin surface preventing visual skin assessments from being undertaken and it is made from arachis (peanut) oil, which may cause allergy (Joint Formulary Committee, 2012). Care should also be taken with paraffin-based products, which can be flammable in larger quantities (NPSA, 2007).

Protect
The aim of a barrier film or cream is to mimic the skin’s natural barrier function with the purpose of protecting, repairing, restoring or preventing skin damage. Barrier films offer protection to at-risk and damaged skin, which prevents excoriation and maceration; this is highlighted in the European Pressure Ulcer Guidelines (EPUAP, 2009). A product with moisturising capability that lays down a durable protective barrier is optimum.

Skin barrier protection evidence
The use of no-sting barrier films began in the UK in the late 1990s and its use has increased steadily (Guest et al, 2011). Guest et al (2011) found that, despite barrier films...
being more expensive to purchase than zinc oxide and petroleum-based products, the reductions in labour offset the additional cost, so much so that the potential savings in the right care settings could reach several millions of pounds. Therefore, economic models including nursing time and material costs favour the use of barrier films and creams. Clinical and service user acceptance, adoption strategy costs and educational requirements must also be considered as they have significant financial impact.

There is increasing evidence relating to the clinical and financial benefits of skin protection, in particular to that of no-sting barrier films and barrier creams when compared to more traditionally used skin protection such as petroleum-based creams (Williams, 2001; Neander and Hesse, 2003; Bale et al, 2004; Zehrer et al, 2004; Cameron et al, 2005; Schuren et al, 2005; Bliss et al, 2007; Clark, 2010; Deakin et al, 2010; Guest et al, 2011).

Clark (2010) and Deakin et al (2010) reported encouraging results in support of Sorbaderm No-Sting Barrier Film and No-Sting Barrier Cream to be equal to, if not better than, the previously used no-sting barrier films. Deakin et al (2010) conducted the trial over a 5-day treatment period on 13 patients with norovirus. At the end of the evaluation 9 of the 13 patients presented with healthy skin and the conclusion was that Sorbaderm No-Sting Barrier Film provided the same or better protection and barrier function than the usual no-sting barrier film product previously used on the ward in all patient cases.

Clark (2010) reported on 92 patients from a multi-centre evaluation of Sorbaderm Barrier Film with 74 patients and Sorbaderm Barrier Cream with 18 patients. Assessments and treatments were administered over a 5-day period, conveying reports of positive visible changes in the appearance of treated and protected skin, comfort and ease of use.

**Study barrier film and cream**

Sorbaderm No-Sting Barrier Film is a non-cytotoxic acrylate copolymer liquid film, which forms a flexible, long-lasting waterproof barrier for the protection of intact skin or the treatment of damaged skin (Aspen, 2010a; 2010b). It has a high-moisture vapour transmission rate (MVTR) acting as a protective interface between the skin and bodily fluids, adhesive products, and mechanical stress and aims to mimic the body’s natural protection function.

Sorbaderm No-Sting Barrier Film can be used clinically for incontinence, peristomal skin protection, periwound skin protection and adhesive trauma protection. It provides up to 72 hours skin protection depending on the severity of the corrosive fluid or exposure and, as it does not contain alcohol, it does not sting. It is transparent, which allows for continuous visualisation and monitoring of skin at risk of breakdown (Aspen Medical, 2010a; 2010b; Clark, 2010; Deakin et al, 2010).

Sorbaderm No-Sting Barrier Cream is highly concentrated and long lasting. It is a latex-free and fragrance-free protective barrier, which does not clog incontinence or dressing devices, and provides effective skin moisturising and long-term barrier protection from bodily fluids. The protective barrier lasts up to three washes or 72 hours, where washing was less than three times, and at each adhesive change and can reduce the risk of incontinence dermatitis. It should be used on at-risk skin, such as:

- Dry skin
- Chaffed skin
- Elderly skin
- During episodes of faecal and urinary incontinence
- Peristomal protection
- Periwound protection.

It may be used on all parts of the body except the mucous membrane (Aspen Medical, 2010a; 2010b; Clark, 2010; Deakin et al, 2010). Investigation of the barrier cream on broken areas of skin was authorised by the manufacturer with the data forming part of a case to expand its indications for use.

**Study results**

The study investigated 95 subjects within a primary health-care organisation and was undertaken in two parts. The objective was to determine the clinical and financial outcomes and clinical acceptability of a newly available range of no-sting barrier film and cream products offering significant financial benefits.

The first part of the study involved extensive evaluation of either the barrier film or cream compared to existing standardised barrier protection care within the organisation. The results indicated that the new product range met all the criteria for formulating inclusion and following this the barrier range was further evaluated in part two. The study was conducted over a 3-month period with patient treatment lasting a minimum of 2 days to a maximum of 4 weeks and adhered to the agreed evaluation protocol as approved by clinical governance.

The results from both parts of the study relating to incontinence subjects (n=25) and stoma subjects (n=3) are presented here.

Equal numbers of male and female subjects were recruited from an elderly population (70–80 years) within nursing homes, terminal care, community hospitals and own homes. The study indicated that barrier cream was used in 20 cases and barrier film was used in 5 incontinent and 3 stoma subjects. Continence type was reported as urinary, faecal, double or severe for norovirus, or highly corrosive perfuse diarrhoea. Continence levels were recorded in frequency and correlated against the number of barrier product applications. Subjects were predominantly in the double (n=15) or severe (n=6) incontinence groups and had a frequency of 6–30 incontinence or wash episodes over 72 hours.

The study barrier film and cream was reported to be easy to use, conformable, no-sting, quick drying, easily absorbed with no residue and compatible with continence device materials.

Visual skin inspection was reported to be dramatically improved, resolved or no damage had occurred when used preventatively, with 100% satisfaction reported. Frequency of application had been no greater than previous standard barrier. When barrier cream had been used the skin was reported to be supplier and less flaky. In the stoma subjects (n=3) no adhesive skin stripping was noted, no disruption to adherence of stoma device was recorded and the peristomal skin remained intact. In a final clinician acceptance evaluation, the study barrier film and cream performance was consistently rated as the same as, better than or much better than existing barrier products used and clinical expectation was met.

**Conclusion**

The maintenance of healthy skin integrity is a significant clinical challenge for health professionals and carers, particularly for those with incontinence. Ensuring fundamental nursing is delivered in relation to
PRODUCT FOCUS  Skin


Key points

- Ageing process increases the risk of skin damage
- Incontinence increases with age
- Maceration is waterlogging of the skin
- Following prolonged exposure to excessive moisture such as urine
- Incontinence-associated dermatitis: Is inflammation of the skin following prolonged exposure to urine and/or faeces
- Skin management prevention and treatment should include the use of barrier film protection against corrosive irritants and adhesive devices.