

# Silicone pressure-reducing pads for the prevention and treatment of pressure ulcers

## Abstract

Pressure ulcers, a key quality of care indicator, cause emotional distress to the patient, affecting quality of life. They also have significant financial implications for the NHS. Pressure ulcer prevention and management are fundamental aspects of nursing. This article reports on the Wirral Community Trust's policy and guidelines for the maintenance of skin integrity. Tissue viability nurses have a duty to review and assess new prevention devices and dressings as they

become available to ensure a high standard of care is provided. A report of an evaluation of the use of KerraPro in combination with current best practice guidelines for the prevention or treatment of pressure ulcers is provided. The author concludes that silicone pressure-reducing pads are a valuable tool in the prevention and treatment of pressure ulcers when used in combination with recommendations from the latest guidelines.

Key words: ■ KerraPro ■ Pressure ulcer prevention ■ Pressure ulcer treatment ■ Pressure-reducing pads

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A pressure ulcer is a localised injury to the skin and/or underlying tissue, usually over a bony prominence, as a result of pressure, or pressure in combination with shear (European Pressure Ulcer Advisory Panel (EPUAP) and National Pressure Ulcer Advisory Panel (NPUAP), 2009). With four recognised levels of injury, pressure ulcers are graded from one to four according to the extent of observable tissue damage:

- Category 1: non-blanchable erythema
- Category 2: partial-thickness tissue loss
- Category 3: full-thickness tissue loss
- Category 4: full-thickness tissue loss with exposed muscle, tendon or bone.

Pressure ulcers are generally considered to be preventable. As such, the presence of pressure ulcers is often seen as a quality of care indicator. They represent a major source of emotional and financial distress for patients, significantly affecting quality of life.

Financial implications for the health service are also substantial: it is estimated that, in the UK, 4% of total NHS expenditure is on pressure ulcers (Butcher and Thompson, 2009).

Despite a significant investment in pressure-redistributing equipment and educating health-care professionals by the NHS, the incidence of pressure ulcers in the UK remains static (Samuriwo, 2012). Up to 20% of patients admitted to acute hospitals develop pressure ulcers (Vanderwee et al, 2007). Costs increase with ulcer stage because the time to heal is longer and because the incidence of complications is higher in more severe cases (Butcher and Thompson, 2009). For example, the cost of treating uncomplicated pressure ulcers ranges from £1214 for a category 1 ulcer to £14 108 for a category 4 ulcer (Dealey et al, 2012). Complications can add considerably to this cost: an episode of cellulitis adds between £1380 and £3722, depending on the category of ulcer, and osteomyelitis adds more than £30 000 per episode (Dealey et al, 2012).

## Your Skin Matters: no avoidable pressure ulcers in NHS-provided care

The National Institute for Health and Care Excellence (NICE) has recently published updated clinical guidelines on the management of pressure ulcers in primary and secondary care (NICE, 2014). These provide the following recommendations for good practice based on the best-available evidence of clinical and cost effectiveness.

**Table 1. SSKIN 5-step model for pressure ulcer prevention (NICE, 2014)**

Skin inspection	Frequent skin inspections ensures red areas may be discovered and treated quickly
Surface	Ensuring patients are assessed and have the most appropriate mattress and seating
Keep moving	Turning patients as per the plan when in bed or ensuring they are able to stand and walk
Increased moisture management	Managing continence or leaking wounds, and preventing dry skin
Nutrition	Providing the appropriate nutrition to meet patient needs

Source: McIntyre (2013)

## Prevention strategies

A good understanding of risk factors can help better prevent pressure ulcers developing. A number of intrinsic factors may contribute to the development of pressure ulcers, including increasing age, level of activity and mobility, poor oxygen perfusion, body weight, poor nutritional intake and dehydration, general health status and morbidities, e.g. diabetes (Butcher and Thompson, 2009). Extrinsic factors contributing to pressure ulcer development include pressure, friction, shearing, temperature, moisture and medication (Butcher and Thompson, 2009).

The body can withstand high interface pressures for a very short period of time and unless the pressure is regularly relieved, damage can occur and a pressure ulcer may develop. Pressure-relieving strategies are central to a prevention strategy. The aim of any prevention strategy is to ensure the highest standard of care is delivered to maintain skin integrity.

All patients deemed to be at risk of pressure ulcer development undergo a thorough formal assessment to determine their level of risk of pressure ulcer development (NICE, 2014). Skin is regularly assessed, especially the most vulnerable areas. Frequency of skin assessment is determined on a patient-by-patient basis according to the patient's level of risk. Health-care professionals should formulate an individualised care plan identifying pressure-reducing measures for those patients clinically assessed as being at risk of developing a pressure ulcer. Positioning and re-positioning are performed at frequent intervals (at least every 6 hours for patients at risk and at least every 4 hours for patients at high risk of developing a pressure ulcer), with changes of position recorded on the patient's chart (NICE, 2014). Guidance is provided on manual handling by health-care professionals and other carers (Wirral Community NHS Trust, 2013). All patients admitted to secondary care and those assessed as being at high risk of developing a pressure ulcer in primary and community care

settings should be placed on a high-specification foam mattress to redistribute pressure (NICE, 2014).

SSKIN is a 5-step model for pressure ulcer prevention that is incorporated into many local guidelines (Table 1). It enables trusts to provide clear information for health-care professionals, patients and carers on what to look for (McIntyre, 2013).

## Treatment

When a pressure ulcer develops, an accurate assessment of the patient and the wound should be performed within 6 hours. It is important to note the location, size and shape of the wound, condition of the wound bed, level and consistency of exudate, pain and malodour, periwound skin condition, signs of infection and the category of ulcer (Fletcher, 2012). The EPUAP and NPUAP (2009) classification tool is used to assess the extent of tissue damage in patients with existing or new pressure ulcers. This provides a formalised specific and valid grading of the tissue damage and aids in determining appropriate care in terms of pressure-redistribution equipment, dressings and influencing the patient's 24-hour care needs. All pressure ulcers of category 2 and above must be reported as a local clinical incident. If pressure ulcers are not treated appropriately, they can develop into severe and complex wounds, and in some cases can prove fatal.

Health-care professionals should formulate an individualised care plan identifying pressure-reducing measures and a holistic wound assessment to decide the most appropriate methods of wound management and dressing. For category 1 pressure ulcers, assessments should be monthly, and for category 2 and above, skin integrity must be assessed weekly (Wirral Community NHS Trust, 2013). Guidance is given on the minimum provision. High-specification foam mattresses are recommended for adults with a pressure ulcer. Should these not redistribute pressure sufficiently, then a dynamic support surface can be considered (NICE, 2014). Positioning and repositioning is recommended at frequent intervals, with changes of position recorded.

## Wound management and debridement

Wound management should be based on the assessment of the pressure ulcer, skin inspection, level of risk, treatment objective and patient preference (NICE, 2014). Necrotic tissue may impede healing and facilitate bacterial infection. The need to debride should be assessed, taking into consideration the amount of necrotic tissue; the grade, size and extent of the pressure ulcer; patient tolerance and any comorbidities (NICE, 2014). The method of debridement should be selected on an individual basis: autolytic debridement is recommended unless it is likely to delay wound healing, in which case sharp debridement may be considered (NICE, 2014). Debridement is not always necessary or appropriate—for example, a patient close to the end of life, or in cases where stable eschar is providing a natural protective cover. Moisture levels of the surrounding skin must be considered: wet skin is more liable to breaking down.

Considerations for dressing selection include clinical effectiveness, ease of application/removal, patient comfort and convenience (including impact on mobility), cost and availability

(Fletcher, 2012). Dressing selection is made with the patient and, if appropriate, their family or carers, taking into account pain and tolerance, position of the ulcer, amount of exudate and the frequency of dressing change (NICE, 2014). Dressings that promote a warm, moist wound-healing environment are recommended to treat grade 2, 3 and 4 pressure ulcers. Gauze dressings are not recommended for adults.

The latest NICE (2014) guidelines recommend that health-care professionals discuss with adults with a heel pressure ulcer (and, if appropriate, their family or carers) a strategy to offload heel pressure as part of their individualised care plan.

## Non-concordance

Non-concordance is regularly cited as a reason for patients developing pressure ulcers. When assessing pressure ulcer risk, the following questions should be considered (Wounds UK, 2013):

- Is the patient able to comprehend the risk of pressure damage?
- Is the patient willing to comply with care?

The 'Love Great Skin' campaign raises awareness of pressure ulcers in the care home and nursing home setting (see [www.lovegreatskin.co.uk](http://www.lovegreatskin.co.uk)). The *How to: Engage with Staff and Patients* guide (Wounds UK and NHS Midlands and East, 2013) explains the importance of involving the patient and/or carers in deciding the best care. Health-care professionals should discuss care and treatment options with patients and/or carers in a way that allows them to make informed decisions.

## The role of silicone pressure-reducing pads in the prevention and treatment of pressure ulcers

There is a body of evidence to support the use of dressings to prevent pressure (Butcher and Thompson, 2010). In Wirral Community NHS Trust, it is considered that the incidence of pressure ulcers can be further reduced by ensuring that patients benefit from evidence-based care for the prevention and management of pressure ulcers. As part of the ongoing commitment to reducing pressure incidence, Wirral Community NHS Trust has implemented the SSKIN bundle for the baseline assessment for pressure ulcer prevention and ensures all community nurses undertake pressure ulcer training every 2 years. A competency programme for all community nurses centred on prevention, assessment and management of pressure ulcers is being developed. Local clinical guidelines on the management of pressure ulcers in primary and secondary care are based on NICE recommendations and informed by the latest literature and evaluations of new products.

An evaluation of KerraPro pressure-reducing pads (Crawford Healthcare) which claim to offer 'prevention through protection' has recently been completed. KerraPro pressure-reducing pads are made from 100% silicone, a material that is flexible, hard-wearing and has the ability to redistribute pressure to protect the skin on bony prominences. They are available in a range of shapes and thicknesses for a variety of applications. They can be autoclaved,

or they can be washed with soap and water, enabling them to be reused on the same patient, thereby helping to contain costs. Strategies for offloading heel pressure are recommended in the latest NICE (2014) guidelines. Furthermore, in a recently published evaluation of KerraPro pressure-reducing pads in patients with category 1 pressure damage, KerraPro Heel was shown to be effective at preventing deterioration and improving skin conditions of patients with category 1 pressure damage (Knowles et al, 2013). We evaluated KerraPro on six patients in combination with current best-practice guidance for the prevention or treatment of pressure ulcers.

## Case studies

### Patient 1

KerraPro Heel and sheets, in conjunction with a dynamic mattress (NICE, 2014) and improved nutritional intake, were used to prevent pressure ulcer development in an 85-year-old male patient in a nursing home who had a category 3 (EPUAP and NPUAP, 2009) pressure ulcer. The patient had been assessed (Waterlow 25+) to be at risk of further pressure ulcer development (NICE, 2014). The patient, a long-term smoker with chronic obstructive pulmonary disorder (COPD), was a long-term oxygen user, and KerraPro gel strips were cut to size and used to protect the skin under the oxygen tubing. Following implementation of these preventative steps, all erythema resolved and KerraPro continues to be used to prevent recurrence.

### Patient 2

KerraPro sheets were used on a 55-year-old female post-hip surgery who, unwilling to move due to pain, developed non-blanching erythema to the feet when in bed (Figures 1 and 2). The KerraPro sheets were held in place by a cotton multi-stretch stockinette, and the patient's analgesia changed. The KerraPro sheets were used over a 4-week period and the patient was nursed on a high-risk foam mattress (NICE, 2014). During this time, the erythema resolved and the patient became mobile again. KerraPro sheets continue to be used, now as a preventative measure.

### Patient 3

KerraPro sheets were used over a combination foam dressing, together with Kerraped (Crawford Healthcare), an all-purpose



Figure 1. Female patient (patient 2) with non-blanching erythema to feet

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Figure 2. KerraPro sheet applied to prevent pressure ulcer development in a female patient with non-blanching erythema to feet

boot, on a 65-year-old female, type 1 diabetic patient following extensive surgery to the right foot (near amputation). The patient was a long-term smoker, suffered vascular disease and was an unstable diabetic, having previously been non-concordant with a diabetic diet and medication. Exudate was managed with suitable dressings and protease modulators were used to stimulate wound healing. However, the wound was slow to heal. The care plan—KerraPro sheets over a combination foam dressing—is not advocated, but good results were achieved (see *Figure 3*). In particular, no maceration was noted. However, further research is required as maceration would be expected due to the occlusion. Until new data are available, using KerraPro according to the prescribing information is advocated. The patient became concordant, quit smoking, and, after 18 months of being housebound, is now able to socialise once again. She is nursed on a high-risk foam mattress (NICE, 2014).

#### Patient 4

A KerraPro sheet was used over a small amount of hydrofibre and hydrocolloid combined with a dynamic mattress and nutritional support on an 85-year-old male patient with a category 3 (EPUAP and NPUAP, 2009) pressure ulcer to the left lateral malleolus. The patient could become aggressive when repositioned to the left side and had a tendency to remove wound care dressings. However, the pressure ulcer healed after 9 weeks and the patient allowed the combined KerraPro/hydrofibre/hydrocolloid dressing to remain in place (*Figure 4*).

#### Patient 5

KerraPro strips were used between the toes of a 90-year-old male who had a history of infected dermatitis and developed non-blanching erythema due to contractures as a result of arthritis. KerraPro strips were applied to offset pressure and topical corticosteroids with absorbent dressings were used to resolve the dermatitis. Nutritional advice was also provided to the patient. The patient found the strips comfortable and opted to continue to use them, even though the foot had healed.

#### Patient 6

KerraPro sheets were used over a foam dressing with hydrofibre in a 93-year-old male patient with a category 3 (EPUAP and NPUAP, 2009) pressure ulcer to the right lateral malleolus. The patient had, until recently, been the main carer for his wife. Following a fall, he developed a pressure ulcer and declined all pressure-relieving equipment. The addition of KerraPro to the foam dressing with hydrofibre helped relieve pressure and protect from additional trauma. The ulcer is healing.

#### Overall opinion

The evaluation of KerraPro pressure-reducing pads for the prevention and management of pressure ulcers yielded some particularly interesting results. Health-care professionals found it easy to use, apply and retain. It is soft, yet durable with the silicone pads being washed and reused over a period of weeks with no visible damage to the silicone. The range of shapes and sizes make it particularly suited to pressure ulcers throughout the body, as the pads can be adapted or cut to size as required. For example, pressure ulcers on an elbow can be managed with KerraPro Heel, while KerraPro sheets can be cut to any shape. Patients found it comfortable—concordance and reduced pain were noted during the evaluation. Most importantly, in this evaluation, KerraPro was shown to prevent pressure ulcers



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Figure 3. KerraPro sheets used over a combination foam dressing, together with Kerraped, an all-purpose boot, in a 65-year-old female, type 1 diabetic patient following extensive surgery to the right foot



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Figure 4. Treatment of a category 3 pressure ulcer in an 85-year-old male patient

developing, or redeveloping, in at-risk patients and achieved healing in patients with pressure ulcers up to category 3 (EPUAP and NPUAP, 2009). KerraPro is indicated for single patient use.

Following this study, KerraPro is now cited in the Wirral Community NHS Trust Pressure Ulcer (2013) strategy as a first-line dressing for the prevention of pressure ulcer development, and is readily available for district nurses to employ as a preventative measure at the point of assessment.

## Conclusion

Pressure ulcer prevention and management are fundamental aspects of nursing, and the Wirral Community NHS Trust has a policy and guidelines on the maintenance of skin integrity that all nurses are educated on and expected to adhere to. Tissue viability nurses have a duty to review and assess new prevention devices and dressings as they become available to ensure that we offer the highest standard of care possible. As stakeholders, nurses have a responsibility to ensure local guidelines are regularly revised and updated in line with national and international guidelines, and they are responsible for training and educating nursing colleagues.

Early intervention can be cost-effective, and prevention is always better than cure. Silicone pressure-reducing pads (KerraPro) are a valuable addition to a care plan for the prevention and treatment of pressure ulcers when used in combination with recommendations from the latest guidelines. The use of KerraPro over dressings is not recommended by the manufacturer, but the results obtained were positive and, counterintuitively, no maceration of the wound resulted. **CWC**

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Figure 5. KerraPro strips were applied to offset pressure between the toes of a 90-year-old male who had a history of infected dermatitis and developed non-blanching erythema due to contractures as a result of arthritis



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Figure 6. KerraPro sheets were used over a foam dressing with hydrofibre in a 93-year-old male patient with a category 3 (EPUAP) pressure ulcer to the right lateral malleolus

## KEY POINTS

- The incidence of pressure ulcers in the UK remains static: up to 20% of patients admitted to acute hospitals develop pressure ulcers
- KerraPro pressure-reducing pads are silicone pads available in a range of shapes and thicknesses and have the ability to redistribute pressure to protect the skin on bony prominences
- Silicone pressure reducing may be a valuable tool in the prevention and treatment of pressure ulcers when used in combination with local and national guidelines