# PRESSURE ULCER PREVENTION IN THE ACUTE SETTING

## USING ADERMA™ IN PRACTICE

Wounds UK

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## CONTENTS

# Pressure ulcer prevention in the acute setting

## INTRODUCTION

Evidence suggests that 4–10% of patients admitted to acute trusts will develop pressure ulcers (PUs), while the estimated cost of PUs to the NHS is £1.4–£2.1bn (Bennett et al, 2004). This represents a significant cost burden in the UK, with costs increasing with ulcer severity (Dealey, 2012).

There is considerable emphasis at a strategic level across the whole of the UK to reduce the number of patients who develop a PU. In England, a Commissioning for Quality and Innovation (CQUIN) payment framework enables commissioners to reward excellence in care delivery by linking a proportion of healthcare providers' income to the achievement of local quality improvement goals. The Safety Thermometer delivery document recommends that CQUIN be used to incentivise improvement in outcomes and that providers focus on PU data, with the aim of reducing all PUs across the health service.

*'Pressure ulcers are regarded as an indicator of care quality'*

Acute care settings can differ in size and speciality as well as the populations they serve. Using prevalence to measure performance is not recommended because an acute organisation cannot influence the number of patients admitted with an existing PU. Therefore defining when a PU is hospital acquired is important. Collecting monthly incidence data on PUs using the Safety Thermometer ensures hospitals are counting PUs and allows trends of improvement or deterioration to be detected over time (Padula et al, 2012). This facilitates targeted training and education, along with implementation of a hospital-wide prevention strategy.

Pressure ulcers should be seen as avoidable rather than inevitable and it is important to develop a culture of non-acceptance of PUs within the hospital. Preventing PUs requires that the multidisciplinary team, patients and carers work together using best practice.

## WHICH PATIENTS ARE AT RISK IN HOSPITAL?

Despite intense focus on prevention and an ambition to eliminate PUs in NHS-provided care (Wounds UK, 2013), it has proved challenging to do so in specific patient groups, with elevated numbers of PUs in patients in critical care, respiratory and vascular units (Coleman et al, 2012). Although reduced mobility/activity is a known risk factor for PU development, there is no single factor that can explain PU risk (Coleman et al, 2012). Rather there is a complex interplay of factors that increase the risk of PU (see Table 1, page 2) (Coleman et al, 2012).

This is supported by findings from root cause analysis (RCA), which suggest that PU risk is related to multiple comorbidities, vascular deficit and, often, the requirement for body-worn medical devices to support vital functions. A further compounding factor is the movement of patients between multiple points of care, which may result in poor communication/documentation with certain tasks not undertaken (eg ordering of equipment).

## SCREENING AND RISK ASSESSMENT

Assessing an individual's risk of developing a PU should involve both informal screening tools and formal assessment procedures (NICE, 2005). This may include a simple screening tool (see www.stopthepressure.co.uk) followed by a standardised PU risk assessment to identify patients at risk. This allows plans for targeted preventive care to be implemented (Ayello and Braden, 2002).

Typically, risk assessment tools evaluate several different dimensions of risk, including mobility, nutrition and moisture, and assign points depending on the extent of any impairment. Most commonly used risk assessment tools include Braden, Norton and Waterlow. However, these tools may not be appropriate for some patient populations such as paediatric, spinal cord injury and palliative care patients when alternative tools should be considered (Table 2, page 3) (Wounds UK, 2013).

TABLE 1: Risk factors for pressure ulceration (adapted from Coleman et al, 2012)

| Risk factor | Measure | Level of significance |
|---|---|---|
| **Reduced mobility/ activity** | Bedbound, chairbound, walking with limitations, walking with no limitations. Those with the greatest reduction in mobility/activity are at greatest risk | High |
| **Skin status/PU status** | Evidence of redness, blanching erythema, dryness; category I PU or history of PU | |
| **Perfusion** | Impaired circulation due diabetes, vascular disease, circulation, blood pressure, smoking and oedema | |
| **Haematological** | Urea and electrolytes, protein, albumin, lymphopenia and low haemoglobin | Moderate |
| **Moisture** | Increased skin moisture, eg due to urinary/faecal incontinence, perspiration | |
| **Nutrition/hydration** | Food intake, weight | |
| **Age** | >65 years can increase risk in presence of other risk factors | |
| **Sensation** | Loss of sensation or ability to report discomfort due to sedative/poor cognitive function | |
| **Body temperature** | Increased body temperature | Direction of relationship unclear |
| **Medication** | Use of sedatives, dopamine, oxygen use and postoperative steroid therapy | |

TIP FOR PRACTICE: RISK ASSESSMENT

It is important to know which risk assessment tool has been used and that this is documented in the patient's records. Different risk assessment tools have different score-to-risk ratios so it is important to clarify which tool is being used and for this to be communicated when transferring patients. For example, a Waterlow score of 9 would not indicate risk, but a Braden score of 9 indicates severe risk.

For patient groups with no identified PU risk assessment tool (eg surgical patients) use the most appropriate tool to capture risk factors. However, a meta-analysis recently concluded that the Braden Scale cannot be used alone for assessing PU risk in surgical patients (He et al, 2012).

For best practice, risk assessment should be performed within six hours of admission (NICE, 2005; Essence of Care, 2010). Staff carrying out these assessments must be competent and have received adequate training.

NHS England figures show that few A&E units are treating all patients within four hours; indeed high numbers of patients are waiting more than 12 hours to be admitted to wards (Clover, 2013). In these circumstances, it is likely that the patient will be nursed on a trolley, and it is generally accepted that the surface on which an individual rests, for example the trolley, bed or chair, will partly determine PU-risk.

Patients nursed on trolleys in emergency care centres should be considered at elevated risk of pressure injury due to the acute phase of their illness and difficulty repositioning, given the restrictive width of the trolley. Standard operating procedures should be developed to facilitate identification of high-risk patients and early transfer from trolley to a bed. Hybrid (foam/alternating pressure) trolley mattresses have recently become available for high-risk patients and should be considered, along with other simple

| TABLE 2: Formal risk assessment tools for different patient groups | |
|---|---|
| Risk assessment tool | Specialty |
| Waterlow (Waterlow, 2005) | Orthopaedic/generic |
| Norton (Norton, 1975) | Older people/generic |
| Braden (Bergstrom et al, 1987) | Generic |
| Andersen (Andersen et al, 1982) | Emergency medicine |
| Cubbin and Jackson (Jackson, 1999) | Intensive care |
| Mortenson et al (2008), Gelis et al (2009a), Gelis et al (2009b) | Spinal cord injury |
| Hunters Hill (Chaplin, 2000) | Palliative care |
| Glamorgan (Willock et al, 2009) | Paediatric |
| Braden Q (Curley et al, 2003a); Braden Q+P (Galvin and Curley, 2012) | Paediatric/perioperative |
| Plymouth maternity pressure sore risk assessment scale (Morison and Baker, 2001) | Midwifery practice |

preventative measures such as dermal pads, when transfer to a bed is delayed (Fumarola, 2012). RCA investigations have identified that pressure injuries highlighted post-admission may have developed during prolonged A&E admission processes and so assurance must be given that such prevention systems are in place to address this risk.

Review of local RCA documents suggests that frequent patient movement between wards/departments within the early stages of hospital admission is one of the most common contributory factors to the development of hospital-acquired pressure damage. Preventative measures that can travel with the patient on transfer can assist.

It is important that assessment, management and prevention of PUs is clearly documented and well communicated. This applies when the patient is transferred to a different area within the hospital — risk levels should be clearly communicated by the hand-over team and include how long the patient was lying in the A&E and any problems in transit that could affect the patient's skin integrity.

Patients in acute care are frequently moved between areas for investigations and during the admission process. Correct use of equipment (eg slidesheets) to aid this process is vitally important to prevent shear and friction.

## IMPLEMENTING PU PREVENTION STRATEGIES

When addressing the needs of a high-risk patient certain measures need to be implemented so that positioning and repositioning are actioned and appropriate specialist equipment used, for example high-specification foam mattresses (NICE, 2005). PU prevention requires the involvement of the multidisciplinary team (MDT) with the development and implementation of standardised approaches that can be tailored to the specific risk profile for each patient; particular attention should be focused on immediate pressure redistribution.

### Using care bundles for PU prevention

One approach that has been used successfully for PU prevention is the SKKIN care bundle (see www.stopthepressure.co.uk). SSKIN includes five essential elements and highlights the importance of monitoring patients for signs of skin damage and using suitable equipment to prevent PU.


Figure 1: Simple resources for implementing SSKIN in practice are available from www.stopthepressure.co.uk

The five elements of a SSKIN bundle are:

- **Support surface** — ensuring appropriate pressure relieving/redistribution equipment or devices are selected. For example, this may include the use of a high-specification support surface and/or dermal pads (see below)
- **Skin inspection** — performing assessment of the entire skin of an individual, with particular emphasis over bony prominences to identify fragile or vulnerable skin and patient's at-risk status
- **Keep moving** — implementing a repositioning schedule that optimises independent movement
- **Incontinence and moisture** — ensuring appropriate management of incontinence, perspiration or exudate in conjunction with a skin care routine to keep the skin clean and dry
- **Nutrition and hydration** — encouraging individuals to eat and drink regularly and assisting patients when necessary to maintain a good nutritional status (Figure 1).

It is important to understand how the different components are related in order to develop an integrated care plan that guides each step in the patient's management. Interventions should follow a structured pathway and involve the MDT (Figure 2). This may include selection of an appropriate support surface and implementation of a skin care regimen, with regular reassessment (eg daily) of the skin as a patient's condition can change very quickly.

Identifying and reacting to changes early by adapting the care plan is key to ongoing PU prevention.

TIPS FOR PRACTICE: USING ADERMA PADS

- ✓ Select appropriate shape and size of dermal pad and place on unbroken skin only
- ✓ Pads may be cut with scissors to fit
- ✓ Remove daily to check the patient's skin
- ✓ Clean the skin and pad once a day. Re-use on same patient
- ✓ Ensure the skin is dry when re-applying pad
- ✓ Store in original pack when not in use

## Aderma™ dermal pads for PU prevention

Aderma dermal pads (Smith & Nephew) are a simple, intuitive technology that can be easily incorporated into existing care pathways (such as the SSKIN bundle) with minimal training (Leonard and Ormond, 2008) (Box 1). The pads are made from a unique polymer gel, which works in a similar way to fatty tissue to re-distribute pressure while protecting bony prominences. They are available in different shapes and sizes and can be used on a range of anatomical areas, including the head, ears, nose, neck and shoulders, sacrum and heels. They can be used under medical devices, but are not indicated for use on open wounds (Fletcher, 2009).

The pads have a modified surface to reduce friction, while the elasticity of the material means that it can change shape with the natural movement of the body. The pads are non-adhesive to allow for regular inspection (a key tenet of PU prevention) and are intended for single-patient use on patients at risk of PU and on areas with early signs of damage to prevent skin breakdown.

The pads can be gently cleaned with plain soap and water and re-used multiple times by the same patient (Fletcher, 2009).

### BOX 1: REDUCING HOSPITAL-ACQUIRED PU USING DERMAL PADS

When used as part of a care plan, dermal pads have been shown to reduce hospital-acquired PUs in one acute Trust by 70% and have contributed to a >40% decline in the overall number of PUs (Figure 3) (Woods, 2012). This evaluation was conducted over a three-month period and involved four wards (elderly, medicine, orthopaedics and general surgery) that historically had a high incidence of PUs. Over the course of the evaluation the hospital-acquired PU incidence was reduced to less than 1% (Woods, 2012). This offers real potential to improve outcomes and meet targets set by the Department of Health's efficiency agenda. The hospital estimates that this resulted in savings of approximately £140,00 in PU treatment costs over a three-month period.

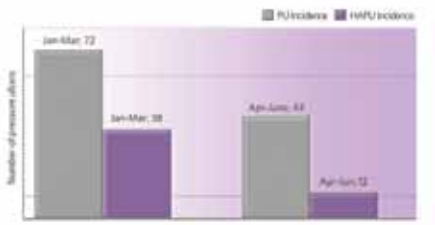

Figure 3: The results show that there was a reduction of approximately 70% in the incidence of hospital-acquired PUs following the introduction of Aderma.

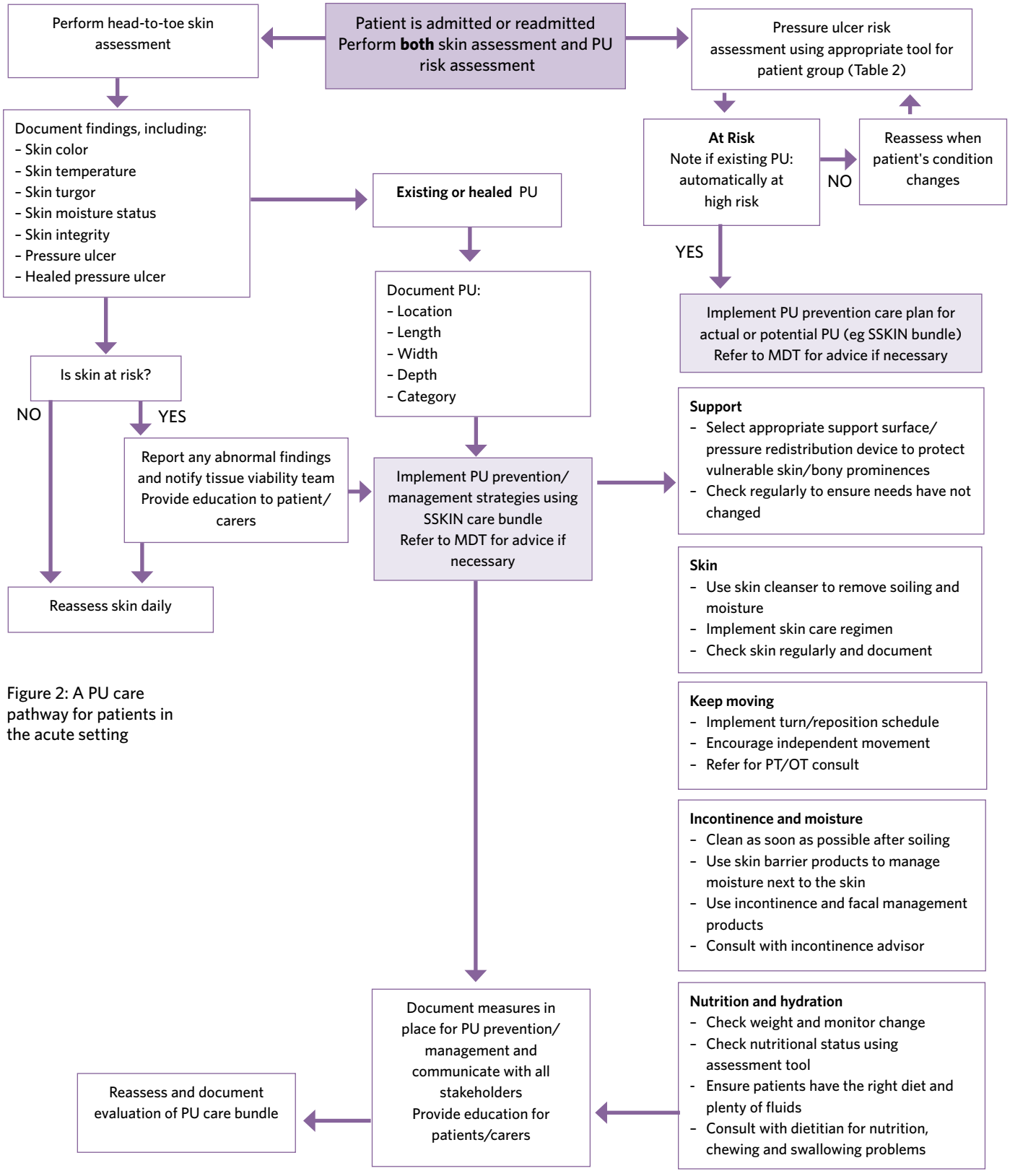


Figure 2: A PU care pathway for patients in the acute setting

## ROLE OF EDUCATION AND TRAINING

Education to prevent pressure damage is important. Due to staff turnover and differences in training received, levels of knowledge and motivation may vary across the organisation and it is vital to identify the staff involved and resources needed to facilitate a better understanding of the costs and importance of PUs. Special attention is required when temporary staff come on to the ward to ensure they are aware of their role in PU prevention and the protocols used.

Jakeman (2012) used multiple strategies to facilitate a culture that was responsive to change, allowing staff in a busy critical care environment to prioritise PU prevention. This led to significant improvements in adherence to protocols for repositioning and equipment use with reductions in the numbers and severity of PUs. She concluded that overcoming these barriers was a vital part of making PU prevention a part of daily care.

Patients and their carers must also be involved in any strategies for prevention; this not only allows them to make informed choices, but also encourages their participation in the prevention activities and can help improve concordance (Wounds UK, 2013).

Boxes 2 and 3 below provide examples of different approaches to education and training to facilitate changing practice and improving patient care.

### BOX 2: USING EXPERIENCE TO IMPROVE CARE

An experience-based design approach was used to bring patients and staff together to share the role of improving care. Parents, children and young people's stories about their experience of developing PUs and their clinical care were collected and used to improve the patient and parent experience. Staff were asked about their experiences of using previous PU prevention tools and the resources available to them. This enabled the working group to identify priorities and agree a starting point.

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Nursing Quality Practice Educator, Great Ormond Street Hospital. For further information please visit: http://www.institute.nhs.uk/quality_and_value/experienced_based_design/the_ebd_approach_(experience_based_design).html

### BOX 3: CHANGING PRACTICE ON THE WARD

The use of dermal pads has been a very simple but effective method of preventing PUs within the orthopaedic unit at the Pilgrim Hospital, Boston. Before using the product, there were significant challenges on the ward with a high PU incidence rate being reported.

For the past 16 months, dermal pads (Aderma Heel) have been used before surgery on all patients admitted to the ward with a fractured neck of femur. This is now an approved Standard Operating Procedure (SOP). Dermal pads are also used to protect vulnerable areas on patients identified as 'at risk' postoperatively, as well as for the period when they are in bed. The ward additionally uses dermal heel pads on any patient who is considered to be 'at risk' of tissue damage due to immobility and underneath orthotic splints used for specific orthopaedic treatments.

Since using this protective product, the ward has had only one incident of harm to a patient. This was due to the product not being used in line with the manufacturer's guidance and highlights the need for appropriate education and training in PU prevention.

**Michael Brunton**
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# Using Aderma in at-risk groups

**This section describes the challenges in a range of at-risk groups. Within each group, individual patients will have a range of risk factors, identified in Table 1 (page 2) and require assessment to ensure appropriate actions are taken. Practical guidance is provided on the use of dermal pads, which should be used as part of a holistic PU prevention strategy.**

## PATIENTS WITH VULNERABLE SKIN

People over 70 years old are particularly vulnerable to PUs due to ageing of the skin and increased likelihood of mobility problems. At the other end of the age spectrum, the very young are at higher risk, as are those who have received a skin injury (eg burns patients). The UK National Institute of Health and Care Excellence (2005) identify individuals at 'extremes of age' as at risk of developing PUs.

Figure 4: Aderma is often used under heels in babies where heel cups do not fit and are too big.

Figure 5: A mock up of an-ill fitting medical device. This is a primary cause of PUs in paediatric practice.

Figure 6: The prevention of occipital PUs is one of the most popular uses of Aderma in paediatric practice.

### Infants, children and young people

Pressure ulcers are not commonly associated with very young babies and children. However, they do occur within paediatric practice. Children continue to be vulnerable to this type of skin injury and the resultant pain and discomfort.

It is extremely important to work with the parents, carers and patients using a family-centred care approach to help reduce anxiety and involve them in repositioning and reporting skin care where possible. An age-appropriate approach to care is also essential; for example, encouraging young people to self-report skin integrity as well as discussion about early mobilisation, rationale and use of products such as Aderma, and the implications of staying in bed.

Although the incidence of PUs in children has not been widely researched, there is evidence that this particular wound type is problematic across various healthcare settings (Parnham, 2012). Groeneveld et al (2004) identified a prevalence of 13.1% in paediatric patients and Curley et al (2003) established an incidence of 27% (86/322) of children developing PUs in paediatric intensive care from 21 days to eight years of age (Parnham, 2012)

Groeneveld et al (2004) cite the most common sites for PU development in children as the sacrum, buttocks, heels, ears, elbows, malleolus and lumbar spine. Curley et al (2003) recognised that the more severe PUs are specific to the occiput, chest and coccyx. This is supported by Butler (2006), who considered the relationship between age and PU formation and suggested that in children younger than 36 months, the occipital region is at greater risk of pressure damage — the head carrying a larger proportion of the total body weight and surface area (Parnham, 2012).

Dermal pads can be used to protect vulnerable areas (eg placed under the head to reduce the risk of PU to the occiput); they can also be tailored to protect from intravenous splints and medical devices (Figures 4–6). The dermal pads should be given to the parent to look after during the child's admission where possible. This reduces the chances of losing the product during any ward transfers, shift changes or bedding changes. Since the introduction of dermal pads to clinical practice in Great Ormond Street Children's Hospital, the number and severity of PUs in these more common sites — especially in the severity of occipital PUs — have decreased (Figure 6; see Box 5, page 8).

Friction injuries occur when skin surfaces such as knees and elbows rub against bedding, while pressure damage is caused by continuous pressure on an area of the body. Monitoring

TIPS FOR PRACTICE: ADERMA IN THE VERY YOUNG

- ✓ Give the dermal pads to the parent to look after during the child's admission where possible
- ✓ Use dermal pads under equipment
- ✓ Use an appropriately sized dermal pad
- ✗ Do not cut the pieces too small so the product gets lost

equipment, intravenous cannulae, continuous positive airway pressure masks or nasal intubation, may cause medical device-related pressure damage if not correctly sited or the inappropriate size is used (Figure 5, page 7) (Irving, 2001). Several authors have reported about 50% of PUs in children and infants are associated with medical devices (Waterlow, 1997; Willock et al, 2005; Noonan et al, 2006; Schlüer et al, 2009). Dermal pads can be used under equipment to prevent tissue damage; however, do not cut the pieces so small that the product gets lost in the cot or bed space.

One example of an 'extreme of age' is the premature neonate. The skin of the premature neonate is not considered functionally mature until 33 weeks gestation (Irving, 2001) and is more susceptible to trauma and infection (Box 4; Sarkar et al, 2010).

**BOX 4: Why is the neonate at higher risk of PU?**

- A higher skin-surface-area-to-weight ratio (700 $cm^2$/Kg) compared to an adult (250 $cm^2$/Kg)
- Less cohesion between the dermis and epidermis, increasing the risk of blisters forming
- The skin is thinner, with reduced amounts of collagen and elastin
- Transdermal fluid loss is higher as the stratum corneum is more permeable
- The pH of the skin is higher than that of an adult, increasing likelihood of bacterial invasion. Cleansing with pH-neutral soap or water alone is recommended (Irving, 2001)
- The skin has not developed its natural lubrication (sebaceous glands are non-functional and sweat glands are less active) (Sarkar et al, 2010)

The pre-term neonate is also vulnerable to heat loss and hats worn to limit this may cause pressure injury to the ears if too tight.

The risks of pressure damage are higher for the pre-term neonate, and special care must be taken to reduce risk (Irving, 2001). When handling premature neonates, use extreme care, as when handled too often, they can become exhausted and stressed (Cleveland, 2008). It is important to remember that they cannot communicate their discomfort. Simple interventions such as easy-to-apply dermal pads can minimise the risk of trauma. Use appropriately sized pads and check the skin regularly to avoid it becoming overly moist, macerated or overheated.

**BOX 5: SETTING UP A PAEDIATRIC PU PREVENTION PLAN**

An audit in early 2012 at Great Ormond Street Hospital in London identified an increase in number of PUs. This led the hospital to form a Pressure Ulcer Prevention and Management Team, comprising team members who work operationally on the wards to provide a responsible service. This was supported by a multiprofessional group to oversee teaching and to analyse the Trust-wide incidence data.

This resulted in a six-point plan, which included:

- A publicity campaign for staff
- Launch of the Glamorgan Paediatric Risk Assessment Tool
- Introduction of a Paediatric SSKIN care bundle
- Investment in new prevention technologies such as dermal pads and specialist beds
- A new teaching programme for staff
- A new root cause analysis tool, which was adopted by the Risk Management Team.

Following implementation there have been significant changes in practice. Nurses are more confident in their approach and have fully integrated the Glamorgan Paediatric Risk Assessment Tool into their practice as part of the SSKIN care bundle. This ensures skin integrity is checked and documented daily. There has been a reduction in overall incidence with smaller and less severe PUs, which has had a significant impact on patient care and on the wellbeing of family members (Kipps and Maxwell, 2013).

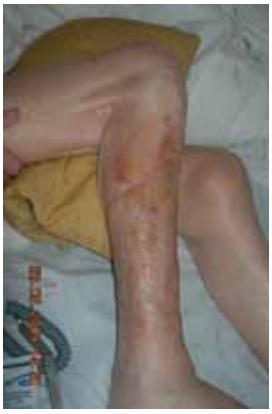

Figure 7. Elderly, immobile patient with dementia who has developed flexion contractures.

Figure 8. Elderly patient with flexion contractures who developed a medial tibial PU. This was due to her limbs being firmly flexed against each other.

Figure 9. Aderma can be used between two opposing surfaces such as between the knees or ankles to prevent pressure injury.

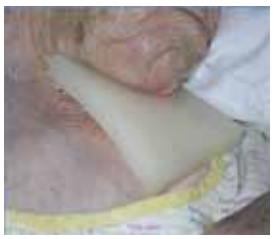

Figure 10. Use Aderma under the chin to prevent skin damage.

## The older person

At the other end of the age spectrum, the older person's skin is vulnerable due to physiological ageing, including loss of elastin and changes in collagen that cause wrinkling and weakness. In addition, the cohesion between the epidermis and dermis becomes less strong and reduced dermal blood supply leads to dryness (Nazarko, 2007). The risk of pressure damage is further exacerbated by the patient's underlying condition, such as altered mobility, poor nutritional status, medication and underlying medical conditions and their treatment (Wounds UK, 2012). In addition, the moisture produced by incontinence, or perspiration from many possible causes, can promote skin permeability, increasing the risk of tissue damage.

The older person may also suffer from conditions that prevent them from communicating distress/discomfort. These include dementia, neurological disease or stroke, which can cause aphasia. Vulnerable adults rely on healthcare professionals to recognise the risk and act to prevent harm.

### *Managing flexion contracture in the elderly*

The ability to reposition is often reduced in people who are very elderly. For example, the development of flexion contractures (Figure 7) in an elderly immobile patient can cause problems with repositioning, but may also lead to PU (Figure 8). Dermal pads can be used to prevent pressure damage, with the flat square fitted between opposing parts of the body (Figure 9). These are thin enough to be inserted without having to force the limbs apart, which may be painful for the patient. Dermal pads can also be used to prevent contracted fingers digging into the palms of the hands.

Dermal pads can also be used between any two opposing surfaces at risk of pressure damage (Figures 9 and 10).

### *Protecting bony prominences*

Similarly, in the older adult the disabling effect of spinal deformity becomes more pronounced and may lead to pressure damage. Dermal pads can be used to protect the spine, which can avoid the rapid development of a serious PU. Likewise, dermal gel sheets or strips can be used to protect bony prominences such as the sacrum, heels, occiput and elbows in elderly patients confined to bed or with limited mobility (see case reports, pages 10, 13–14).

### TIPS FOR PRACTICE: USING ADERMA HEEL PAD

- ✓ Aderma Heel can be used either way round, depending on whether the patient is sitting in a chair or lying in bed. Place the long side over the back of the heel for patients lying in bed to protect the Achilles tendon (Figure 11)
- ✓ Use the patient's own sock or tubular bandage to secure the pad
- ✓ Alternatively, simply place a sheet of Aderma between the heel and surface of the mattress to prevent pressure damage (Figure 12)

Figure 11. Applying Aderma Heel.

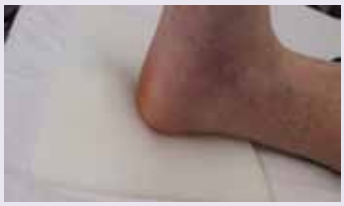

Figure 12. Aderma sheet placed under heel

## CASE STUDY: PREVENTION OF A SACRAL PRESSURE ULCER

An 82-year-old female presented with pain due to severe and chronic osteoarthritis, which was most prominent in her hips and spine. This made it difficult for the patient to position herself while at rest and she slept in a recliner due to the discomfort. She had previously had a small wound in the coccyx region, which had healed. The placement of a dermal sacral pad led to greater comfort and she became less anxious about the skin breaking down. The patient's undergarments were used to keep the pad in place (Figure 13). Over the three-week observation period, there was no deterioration in skin integrity.

Reproduced from *Pressure Ulcer Prevention e-module* (www.e-academy.wounds-uk.com)

**Figure 13. Aderma Sacrum *in-situ.***

### TIPS FOR PRACTICE: ADERMA IN BURNS PATIENTS

- ✓ Use low-tack tape to secure dermal pads when required. This is atraumatic to fragile skin and facilitates easy removal for pressure area checks
- ✓ Tube bandages can be used to secure pads. These are thinner than regular crepe bandages and assist with positioning of the dermal pad
- × Avoid poor bandaging techniques that present a tourniquet risk to healed and non-healed burn damaged areas
- ✓ Apply dermal pads to intact skin only

### The burns patient

In the UK, approximately 13,000 patients visit A&E departments every year with a burn injury. One-thousand will require inpatient admission and fluid resuscitation. Despite advances over the last 60 years, 300 will die, and the majority of these will be elderly (National Burn Care Review, 2001). A recent review by the South East Burns Network (Nikkhah and Dheansa, 2013) found that up to 80% of burn injuries admitted to hospital could be cared for in burn facilities, rather than the more complex burn unit and burn centre environment.

As general hospitals and trauma centres apply for and gain burn facility status, tissue viability nurses in the general acute setting could be called on to assess and advise on wound care and PU prevention strategies for patients with burn wounds. A review of evidence-based practice for the prevention of PUs in burn patients by Gordon et al (2004) states that the magnitude of PU problems in burn patients is essentially unknown, and the literature is devoid of research to guide burn care practice in skin risk assessment, PU prevention and management. A more recent study of PUs in burn patients by Lewis et al (2012) stated that risk and incidence of PUs in burn patients are poorly researched and understood.

Although the research into PU in burn patients is sparse, several studies (Fritsch et al 2001, Gordon et al, 2004; Lewis et al, 2011; Lewis et al, 2012) have all identified specific risk factors that predispose burn patients to PU development:

- Initial hypovolaemic shock leading to reduced skin perfusion
- Use of sedatives, muscle relaxants, intravenous (IV) opioids leaving the patient unable to move at all
- Massive oedema from fluid resuscitation and physiological fluid shifts from blood vessels to tissues, increasing perfusion distance and reducing skin perfusion
- Multiple surgical procedures for debridement and skin grafting/flaps
- Immobility from bulky dressings and the risk of tight bandages over oedematous areas
- Immobility from limb splints applied to help prevent skin contractures
- Postoperative immobilisation to reduce shearing and graft loss
- Patient reluctance to move due to pain or anxiety
- Systemic sepsis and multiple organ failure (ie significant burns); the resulting hypovolaemia may require treatment with inotropes. Both low fluid volume and inotropes may reduce skin perfusion

- Malnutrition due to a hypermetabolic response to burn injury
- Splinting and bulky body dressings may make skin inspection difficult and inaccurate.

*Using dermal pads in burns patients*

A review of best practice for the prevention of PUs in burn patients by Gordon et al (2004) recommends the use of pressure-relieving mattresses with further pressure-relieving devices for those confined to bed. Securing any type of dressing or pressure-relieving devices to burn-damaged skin can present challenges. Newly healed skin that has been previously burned is also very fragile and easily broken post-injury. Pressure areas with surrounding burn damaged skin can be prone to oedema and infection.

The use of dermal pads can complement good nursing practice when caring for burn patients by providing comfortable pressure relief to patients who may be confined to bed (see case study below). The non-adhesive pads can be easily removed for regular inspection and allow room for swelling due to oedema, which is a specific risk factor in burn patients.

## CASE STUDY: PREVENTING PU IN A BURN PATIENT

An 88-year-old male was admitted to a medical ward after collapsing at home while carrying a cup of freshly-made tea. The patient was on the floor for several hours before being found by carers. Medical treatment included IV fluids, as the patient was found to be dehydrated on admission, and antibiotics for chest infection. Scald burns were found on the abdomen and left hip totalling approximately 1.5% coverage. The scald burns were superficial and the skin intact. Silicone-based foam dressings were applied to protect vulnerable skin. On admission the patient was found to have a category I sacral PU and discoloured heels.

After an initial risk assessment (Waterlow score of 18), a pressure-relieving mattress and cushions were ordered and inflatable boots to protect the heels were applied as per hospital protocol. The patient found the boots to be uncomfortable and too hot.

Staff were concerned that the patient was reluctant to move and, due to discomfort, the tissue viability team was contacted. Dermal heel pads were applied to both heels and analgesia was reviewed to ensure the patient was receiving adequate pain relief. Dermal pads were used throughout the patient's 10-day stay in conjunction with daily skin checks and repositioning. The patient's heels remained slightly reddened, but no deterioration in skin health was noted (Figure 14).

The dermal pads were easily removed for physiotherapy sessions and after five days the patient was mobilising with a Zimmer frame. In this case, the patient found the dermal pads more acceptable than pressure-relieving boots.

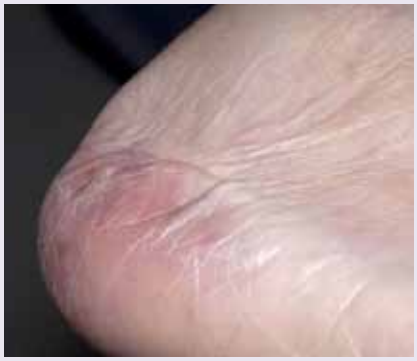

**Figure 14. Early signs of PU in the heel area. Further damage was prevented through the application of dermal heel pads. PUs on the heel occur frequently and can lead to significant morbidity and mortality (Black, 2012).**

Figure 15: Ensure the patient's foot does not rest on the foot of the bed or on equipment (top), as this can lead to pressure damage (bottom).

## TIPS FOR PRACTICE: USING ADERMA IN SURGICAL PATIENTS

- ✓ Assess the patient's skin pre-, intra- and postoperatively to ensure seamless preventative strategies and early diagnosis of skin changes
- ✓ Place pressure-redistributing devices on areas at risk of PU
- ✓ Plan ahead. If you know the patient is going to theatre, have equipment in place and ready for use

## IMMOBILE PATIENTS

Immobility is a major risk factor for hospitalised patients, alongside perfusion and skin/PU status (Coleman et al, 2012). The period of immobility will directly affect PU risk. Prevention strategies therefore need to take account of the length of time the patient is immobile. When in the supine position, the heels and sacrum are at increased risk and the use of pressure-relieving devices may help minimise tissue damage over these areas (Wounds UK, 2013).

### Surgical patients

The length of hospital stay varies depending on the type of surgical procedure being performed. Patients admitted for surgery will often only require high-dependency care on the day of the operation and for a short time after the procedure. Surgical patients are at greater risk of PU than general acute care patients. This may be due to a combination of comorbidities, pain, prolonged immobility and anaesthesia. Bliss and Simini (1999) suggest that this risk is higher in emergency surgery when the patient may have suffered blood loss, be in shock and have spent excessive time on a trolley. In addition, the use of sedatives, hypnotics and paralysing agents can cause reduced awareness and enforced immobility. Induced hypotension can influence peripheral circulation and increase PU-risk.

Positioning of the patient intra-operatively is vitally important to the safety of the surgery and repositioning may be difficult. The sustained high pressure from patient positions held and/or various devices used, tissue temperatures as well as the length of the procedure contribute to risk. High-risk areas should be identified before the patient is positioned so pressure-redistributing devices can be put into place. Theatre mattresses should have pressure-redistributing qualities to support the patient, and a variety of foam and gel pressure redistributing devices used to support limbs and protect bony prominences from pressure, shear and friction (Wounds UK, 2012).

### Trauma and critically-ill patients

Patients admitted after trauma (eg road traffic accident) may be rendered immobile for prolonged periods and require intubation and sedation. This may be compounded by the need to use immobilising devices, such as a cervical collars, to minimise additional damage to the spinal cord (Walker, 2012). Such devices may prevent the use of standard protocols to relieve pressure. High-specification alternating mattresses, frequent monitoring and good skin care are vital to maintain skin integrity. Patients with spinal cord injury present significant additional risks due to prolonged periods of sitting, absence of sensation and repetitive exposure to pressure, friction and shear forces (Vaishampayan et al, 2012; Stinson et al, 2013).

Further, it is important to assess the patient's position in relation to any medical equipment or devices used that are in contact with the skin. For example, ensure the patient's foot is not pressed against the foot of the bed or equipment (Figure 15).

However, it may not be possible to reposition patients with certain illnesses, such as spinal or cardiac instability. Take great care to ensure that they are managed on appropriate equipment and whatever strategies the patient can tolerate are put in place. Brindle et al (2013) suggest safe and effective ways of repositioning these patients, such as slow, incremental turns or using the mobility features of specialist beds to adjust the patient's position.

The following case reports (page 13) illustrate the multiple factors involved when caring for critically-ill patients.

## CASE STUDY: SAFEGUARDING AGAINST PRESSURE DAMAGE IN A CRITICALLY-ILL PATIENT

A 53-year-old male with no significant past medical history was admitted to hospital with pancreatitis of unknown cause, renal failure and sepsis. His condition deteriorated and he required ventilation. A CT scan showed worsening necrotising pancreatitis and an air-filled abdomen, which led to laparotomy, left hemicolectomy and pancreatic tail necrosectomy. The wound could not be closed and the patient was managed with an open abdomen. Over the next 20 days he responded well to treatment and staff on the unit had commenced weaning the patient off the ventilator. Unfortunately, after the sudden onset of pain in the left hand side of the abdomen, he returned to theatre to have a collection of pus washout, which was repeated on five occasions. He continued to be cared for on the intensive care unit. He was ventilated and on inotropes.

During this period the patient was nursed on an alternating pressure mattress replacement system and a SSKIN care plan was implemented. The patient was reposition two-hourly and dermal pads were applied to the heels and over the tips of the ears and elbows (Figure 16). However, the omission to apply the dermal strip correctly on one occasion after the second operation resulted in the development of a category 1 to the pinna of the right ear.

The intensive care staff changed from using a dermal strip to protect the ear from damage to using a 10cm x 10cm x 0.3cm sheet to protect the whole ear (Figure 17). Despite the patient's prolonged critical illness, this simple change safeguarded him from additional pressure damage.

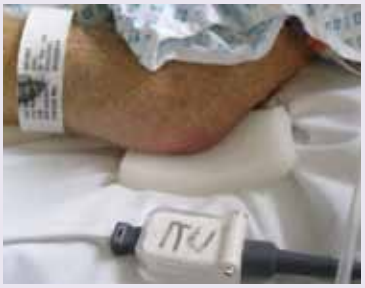

Figure 16: Aderma pad placed under the patient's elbow while in the intensive care unit.

Figure 17: Aderma sheet placed under the patient's ear, replacing the dermal strip used previously.

## CASE STUDY: PU PREVENTION IN A CARDIAC PATIENT

A 70-year-old male was admitted to the cardiac ward with complete heart block, which required pacing. His medical history included type 2 diabetes, peripheral neuropathy and peripheral vascular disease. On admission, he was in a critical condition for 12 days before stabilising. At this time, the patient was reported as having a category 2 PU (Figure 18) to his left heel and a category 3 PU to his right heel.

The subsequent RCA found that nursing staff in A&E carried out appropriate PU screening, alerting the ward staff to the patient's elevated risk level. A Waterlow risk assessment was carried out within six hours of admission to the ward. However, despite the patient's prolonged acute condition, reassessments were not timely or accurately completed. A pressure-relieving mattress replacement system was ordered after initial assessment. However, the patient refused this due to previous discomfort. In addition, three of the five elements of the SSKIN bundle were not completed consistently: Surface, Skin Inspection and Keep moving. Problems with the contact for the pacing wire, which was lost when the patient was turned or tilted onto his right side, partly prohibited regular repositioning.

Dermal pads have been used in the Trust for a number of years. However, on this occasion they were not considered until after the damage had occurred. The pressure damage was seen as avoidable and reported to the relevant authorities. Dermal pads are now considered as part of the initial prevention strategy within the Trust for all patients.

Figure 18: This patient developed a category 2 PU to his left heel during admission for complete heart block. Loss of contact with the pacing wire when turning the patient prohibited regular repositioning.

TIPS FOR PRACTICE: USING ADERMA IN THE CRITICALLY-ILL PATIENT

- ✓ Keep skin clean and dry
- ✓ Check skin frequently — lift up the pad to look underneath
- ✓ Wash when appropriate (eg due to soiling) and re-apply
- ✓ Remove pad for 1–2 hours to allow skin to breath and avoid maceration (especially when patients are sitting out for prolonged periods). This should be combined with regular repositioning of the patient to avoid pressure damage
- ✓ Keep the packaging and store the Aderma in the blister pack when not needed by the patient.

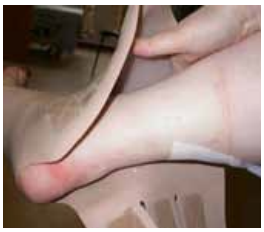

**Figure 19: Tissue damage due to external splint. The use of a dermal strip or pad could have prevented this damage.**

### Orthopaedic patients

Patients with ill-fitting casts, which immobilise the limb, may be placed in the same category, as they cannot move away from the pressure caused by the cast, in addition to having reduced overall mobility with lower limb casts.

Patients with orthopaedic casts should be encouraged to report any discomfort and pain as these may indicate early signs of tissue damage. The cast may need to be removed or replaced if oedema occurs as this increases the risk of damage. Patients should also be advised to report any change in colour of the extremities and numbness and tingling, which could be the precursors to pressure damage. Dermal pads can be used under removable casts to prevent this damage from occurring (Figure 19). Pads should be cleaned and the skin inspected on a daily basis.

TABLE 3: SUMMARY OF PREVENTION STRATEGIES FOR AT-RISK PATIENTS

| Action | Rationale | How to demonstrate evidence of action |
|---|---|---|
| Assess the patient using an appropriate risk assessment tool to identify factors that increase risk of skin breakdown | Early identification of risk factors will allow implementation of appropriate prevention strategies to protect vulnerable skin | Document any risk factors identified and specific actions indicated |
| Ensure all five elements of the SSKIN bundle are followed | Regular inspection of the skin and use of appropriate strategies to maintain skin health will help to reduce PU incidence | Document all five elements of the SSKIN bundle to identify any actions taken |
| When appropriate apply a dermal pad to areas at risk of pressure damage (eg over bony prominences or under medical devices) | Padding vulnerable areas will help to redistribute pressure | Document actions taken including shape and size of pad and placement. Mark on body map where appropriate |
| Use appropriate barrier products for areas at risk of moisture-related skin damage | Prolonged exposure to moisture can weaken the skin, increasing PU-risk | Document use of barrier products, type and frequency of application |
| Change patient's position at regular intervals and according to local protocols | Immobile patients who are unable to change position are at high risk of PU | Turn patients at regular intervals (eg every two hours) and document in patient's health records |
| For patients who cannot be repositioned regularly (eg patients with spinal cord injury) use passive exercises | Even small bodily movements can provide adequate pressure relief and encourage circulation | Involve members of the MDT (eg physiotherapists) in the care of the patient and document actions |
| Assess the patient in relation to any medical equipment or devices in contact with the skin | The skin is most vulnerable where it comes into contact with any surface | Check the skin regularly where it comes into contact with any device or medical equipment. Check the bed linen and smooth to prevent wrinkles |
| Protect at-risk areas by offloading or using simple measures such as dermal pads to redistribute pressure | The heels and sacrum are most at risk in patients who are immobile | Document actions taken in protecting vulnerable skin, including the size and type of dermal pads/dressings used |

# Preventing device-related PUs

Figure 20: PUs can occur on the head where patients need to be nursed without pillows. The skull has no fatty tissue and the bone is almost directly in contact with the skin. Dermal pads can be used to protect the area. The thickness of the pad is not sufficient to change the patient's position, but is thick enough to support the head and redistribute pressure (Fletcher, 2012).

Although a plethora of information is available on PUs in general, there is limited awareness of device-related pressure ulcers (DRPUs) (Fletcher 2012).

There is no definitive definition of a DRPU. Although sharing common features, DRPUs differ from 'classic' PUs in both aetiology and location (Jaul, 2013). Both types of pressure damage are caused by pressure being applied to tissue. While PUs usually develop over a bony prominence (EPUAP/NPUAP, 2009), a DRPU can occur on the skin or mucosal membrane in the absence of a bony prominence, specifically due to an external medical device (Black et al, 2010; NPUAP, 2013). The lack of clarity in defining DRPUs can result in these types of wounds being incorrectly classified as other wound types, for example abrasions or trauma wounds. If incorrectly classified, this can potentially impair the implementation of effective preventive management strategies (Guy et al, 2013).

As medical technology advances, an array of different medical devices is routinely used in acute patient care (Box 5).

**BOX 5: Examples of medical devices**

- Nasogastic tubes
- Gastrostomy tubes
- Catheters
- Bowel management systems
- Intravenous cannula
- Plaster casts, splints and braces
- Anti-embolic stockings
- Nasal cannula and tubing
- Oxygen masks
- Non-invasive ventilation equipment
- Tracheostomy tubes
- $SPO_2$ probes
- Prostheses

These medical devices can be a risk to skin integrity in a number of ways:

- The materials used to manufacture the devices, eg plastics, rubber etc can be rigid and inflexible
- The devices can cause direct pressure to the skin, not necessarily always over bony prominences; mucosal membranes can also be affected (NPUAP, 2013)
- The presence of medical devices can affect the microclimate of the skin in terms of temperature and humidity (Black et al, 2010), potentially causing skin maceration (Redlin Lowe, 2009)
- Some devices require a tight seal and/or secure fixation to be effective in delivering therapy, potentially causing significant, but unavoidable, direct pressure to the skin
- Regularly moving the device may be restricted by patient/device stability
- The physical device or fixation required can restrict regular skin assessment and inhibit early detection of tissue damage.

A DRPU may not be typically rounded in presentation; it may resemble the shape of the device involved, eg long and tubular shaped from oxygen tubing (Fletcher 2012). Apold and Rydrych (2012) identified that 70% of DRPUs developed in the head and neck region, a stark contrast to non-device related pressure damage, but acknowledges the large number of devices used in these anatomical areas.

The challenge of using devices, particularly in the head and neck region, is that some areas lack adipose tissue coverage, ie ears/nasal area, therefore increasing the risk of pressure damage from a medical device (Fletcher, 2012) (Figure 20). Iatrogenic DRPUs can occur as a result of incorrectly-sized or poorly-fitting medical devices (Apold and Rydrych, 2012), or due to insufficient protection from the device (Black et al, 2013).

### TIPS FOR PRACTICE: EAR PROTECTION

- ✓ Thread a dermal strip onto the tape of the oxygen mask to help keep it in place or roll around the tubing (Figures 21 and 22)
- × Do not create more pressure by placing dermal pads or strips beneath devices that are too tight

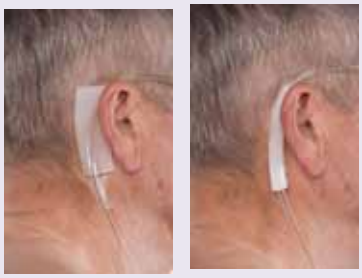

Figure 21: PUs can occur on the ears where several devices may be squeezed into a tight space. Dermal strips can be rolled around tubing to minimise the risk of pressure damage. If additional fixation is required, silicone tape can be used to hold the tubing and the dermal strip in place.

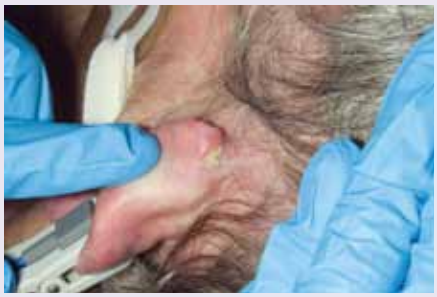

Figure 22: A patient admitted to critical care who previously had been receiving oxygen therapy through a nasal cannula. Dermal strips applied at the beginning of oxygen therapy may have prevented this lesion.

## WHO IS AT RISK?

The published literature identifies that the incidence of DRPUs is 21%–34.5% (Black et al, 2010; Apold and Rydrych, 2012; Jaul, 2013). Although any patient with a medical device in place is at risk of a DRPU, some groups have an increased risk. These include critically-ill patients (Apold and Rdrych, 2012), paediatrics (Waterlow, 2007; Wounds UK, 2013), orthopaedic patients and patients with impaired sensory perception or the inability to effectively communicate discomfort caused by the device, such as spinal or neonatal patients (Black et al, 2010). A recent campaign by the NPAUP has highlighted the range of damage caused by medical devices (see http://www.npuap.org/wp-content/uploads/2013/04/Medical-Device-Poster.pdf).

## IMPLEMENTING DRPU PREVENTION STRATEGIES

Preventing DRPUs can be more complex than preventing PUs over more obvious sites, such as the heels and sacral area, because the device may be supporting essential physiological function. Correct selection of devices is crucial and it is essential that, where possible, devices are fixed correctly and repositioned regularly.

The following strategy should be adopted to reduce risk of pressure damage:

- **Identify** — patients at risk of DRPU should be identified as early as possible. It is essential that a strategy, aimed at minimising the associated risk and optimising skin integrity protection, be implemented.
- **Assess** — this includes skin assessment (Wounds UK, 2013), what type of device is being used, where it will be positioned and how long it will remain in place.
- **Protect** — several options can help protect against DRPU development where medical devices are used. Secure and appropriate fixation is vital (Apold and Rydrych, 2012). This includes, where possible, repositioning and skin visualisation. Thin dressings can be used to help protect the skin (Black et al, 2013) and assist with fixation. A barrier film spray or cream can help reduce moisture (eg from secretions) as this can often be a contributory factor in the development of DRPUs at some sites (eg tracheostomy or endotracheal tubes). Avoid adhesive tapes in neonates and those with fragile skin and use soft silicone versions instead (Wounds UK, 2013). For bony prominences and/or areas of minimal adipose tissue, consider dermal pads. These can be placed safely under many medical devices, helping to redistribute pressure over a larger area without compromising therapy delivery. Sheets or strips can be cut to fit unusual shaped areas, and lifted/repositioned as required. Regular repositioning of the medical device, as the patient's condition allows, is key to avoiding DRPU, although the

frequency of device repositioning or possible loosening depends on the device itself. This should be performed once per shift as a minimum (Black et al, 2010; Fletcher, 2012), or more frequently if appropriate.

- **Monitor** — ongoing skin assessment around and under the device is essential to monitor the effect the device is having on the surrounding tissue. Skin inspection needs to be consistent (Baharestani 2013). Alongside monitoring the device itself, pay attention to the accessory tubing, connectors and/or clamps to prevent further damage if a patient is repositioned on to the medical device (Black et al, 2010).

An effective DRPU preventative strategy must include regularly reviewing whether the device is still required, and promptly removing it when the device is no longer needed.

### TIPS FOR PRACTICE: USING ADERMA UNDER ENDOTRACHEAL (ET) TUBE

- ✓ Place the middle part of a long strip of Aderma under the ET tube on the lower edge of the lip (this is the greatest pressure point) (Figure 23)
- ✓ Loop each end of the dermal strip under the ET tie (next to the patient's skin) ensuring the corners of the mouth are covered with the gel pad
- ✓ To secure in place loop the remainder over the outer side of the ET tie (the weight of the Aderma will keep this in place) (Figure 24)

Figure 23 (top) and Figure 24 (bottom): ET tube with Aderma *in situ*.

### TIPS FOR PRACTICE: USING ADERMA WITH FACE MASKS

- ✓ Ensure the skin is clean and dry (no moisture present)
- ✓ Cut the dermal strip to right size
- ✓ Take time to ensure a good seal with the mask (Figure 25)

Note: Where pressure is not a problem, but friction may be an issue, use a soft silicone tape (eg OPSITE™ FlexiFix Gentle, Smith & Nephew) under the mask to improve comfort. This tape can also be used to secure the dermal strip where pressure relief is required.

Figure 25: Aderma strips have been applied to protect the bridge of the nose and over the ears to prevent pressure damage.

## CASE STUDY: USING ADERMA TO REDUCE PRESSURE DAMAGE AT TRACHEOSTOMY-SKIN INTERFACE

A 70-year-old-female underwent mitral and aortic valve replacements and coronary artery bypass surgery. Ten days post-surgery she required the insertion of a tracheostomy to assist with respiratory management. Dermal strips were used along with other care actions related to the care of a tracheostomy to prevent pressure damage around the stoma site (Figure 26).

The tracheostomy site was cleaned with normal saline and a barrier film spray used to reduce moisture from secretions and humidified oxygen. A foam tracheostomy dressing was applied and redressed three times daily or as necessary.

Dermal strips were applied according to the trust protocol as follows:

1. Place the middle part of a long strip of Aderma under the lower edge of the tracheostomy (this is the greatest pressure point)
2. Loop each end of the dermal strip under the tracheostomy tape
3. To secure in place, loop the remainder over the outer side of the tracheostomy tape (the weight of the Aderma will keep this in place).

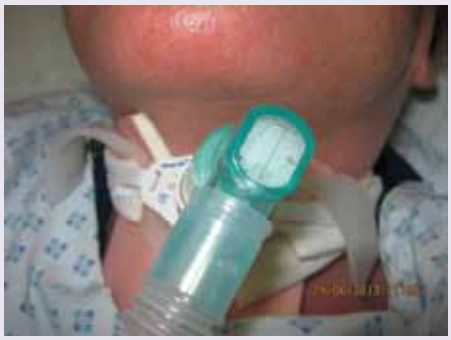

**Figure 26: Aderma can protect the skin under the tracheostomy flange in patients who have had tracheostomies.**

**TABLE 4: SUMMARY OF PREVENTION STRATEGIES FOR DEVICE-RELATED PRESSURE ULCERS**

| Action | Rationale | How to demonstrate evidence of action |
|---|---|---|
| Ensure that the medical device to be used is the correct size and /or fit for the patient (eg anti-embolic stockings, urinary catheter) | Ill-fitting devices can cause unnecessary and avoidable pressure to the skin | Correctly measure and fit devices, documenting in the care records the size and type of device used |
| Assess for the patient and identify any factors that may increase the risk of DRPU (eg oedema/moisture, etc) | Early identification of specific individual risk factors lets clinicians ensure all preventative measures have been implemented | Document any relevant risk factors identified in the care records, including specific actions taken to address those risk factors |
| Where appropriate apply a 'pad' layer to the skin before applying devices | Padding vulnerable areas helps redistribute the intensity of contact pressure | Document actions taken in protecting vulnerable skin from device-related pressure, including the size and type of dressings and use of dermal pads |
| Check the immobilised patient regularly to ensure they are not lying on a device or associated tubing etc | After repositioning, patients can inadvertently be left with the medical device pressing against the skin | Check and document skin assessment during repositioning, highlighting in care records vulnerable at-risk areas |
| For male urinary catheter sites, ensure catheter tube is not under tension and general catheter care is given | Pulling taut on the catheter tube can contribute to pressure, shear and friction at the entrance of the catheter | Check and document skin assessment and assurance that catheter is not under tension |
| For nasogastric tubes, ensure the tubing is free-floating in the nasal nare and not pressed against the nasal septum/ nostril, and not pressing against the face/ head when the patient is positioned on his/her side | Securing devices so there is no contact pressure on the skin reduces the risk of DRPU development | Check device placement/fixation and document as part of skin assessment |
| When initiating oxygen therapy ensure ear protection is in place before tube placement | Protection to prevent contact pressure on the skin reduces the risk of DRPU development | Check device placement/fixation and document as part of skin assessment |
| Where face masks are used, ensure the tension of the straps are not too tight and pad vulnerable areas where appropriate | Protection to prevent contact pressure on the skin reduces the risk of DRPU development | Check device placement/fixation and document as part of skin assessment |
| For colostomy or ileostomy patients, belts worn to secure stoma pouch can cause pressure damage if applied too tightly or the patient has an underlying spinal deformity causing the belt to sit incorrectly on the skin | Protection in place under the belt or over spinal deformity reduces the risk of DRPU development | Check placement of belt and document skin assessment |

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