WUK BPS

Best Practice Statement

Eliminating pressure ulcers

2013

Prevalence and incidence in the UK

Screening and assessment

Pressure ulcer prevention plans

Preventing pressure ulcers in surgical patients

Preventing pressure ulcers in neonates and paediatric patients

Reducing incidence

Wounds UK

BEST PRACTICE STATEMENT: ELIMINATING PRESSURE ULCERS (2013)

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Developing Best Practice

Around 412,000 people in the UK are likely to develop a pressure ulcer (PU) every year (Bennett et al, 2004), including 4–10% of patients admitted to hospital (RCN, 2005). An estimated 31% of PUs are category III or IV (Posnett et al, 2009), while the development of a PU carries a 2–4 times increased risk of mortality for elderly patients in intensive care (RCN, 2005). The average cost to treat one category IV pressure ulcer is £10,551 per episode (Bennett et al, 2004). PUs also lead to an average additional length of stay of four days (Graves et al, 2005).

The large numbers of patients affected, and high cost associated with PUs, means that they have become a key quality issue for the NHS. Zero tolerance to avoidable PUs is being implemented widely as a Quality of Care indicator.

Staff and carers involved in looking after individuals at risk, or with an existing pressure ulcer, should use established guidance on the prevention and treatment/management of PUs to ensure that best practice is provided. In addition, they should follow local protocols.

However, where practitioners access the latest published research, it can often be difficult to establish what changes, if any, a practitioner should make to his or her practice to ensure that it is optimal. Frequently, research papers call for further research to be conducted, or arrive at conclusions that can leave practitioners unclear as to how their practice should be developed.

In view of these challenges, there is a need for clear and concise guidance on how to deliver optimal care. One method of supporting clinicians is the provision of best practice statements. In developing the Wounds UK Best Practice Statements, the relevant research has been reviewed, and expert opinion and clinical guidance is provided in a clear, accessible format.

The key principles of best practice (listed below) ensure that clinicians have an increased awareness, allowing them to exercise due care and process to promote the delivery of the highest standards of care across all care settings, and by all healthcare professionals.

- Best Practice Statements (BPS) are intended to guide practice and promote a consistent and cohesive approach to care.
- BPS are primarily intended for use by registered nurses, midwives and the staff who support them, but they may also contribute to multidisciplinary working and be of guidance to other members of the healthcare team.
- Statements are derived from the best available evidence, including expert opinion at the time they are produced, recognising that levels and types of evidence vary.
- Information is gathered from a broad range of sources to identify existing or previous initiatives at local and national level, incorporate work of a qualitative and quantitative nature, and establish consensus.
- Statements are targeted at practitioners, using language that is both accessible and meaningful.

The aim of this best practice statement is to provide relevant and useful information to guide those active in the clinical area, and who are responsible for patients at risk of a PU or those with an existing PU.

The Best Practice Statement: *Eliminating pressure ulcers* uses the latest literature, including international, national and regional guidelines to provide information that reflects current best practice, as well as the expert opinion of a team of specialists, chaired by Jacqui Fletcher (see page 2). During the peer review process, practitioners from the UK have been invited to comment on the various drafts. Their expertise has been sought to cover best practice across a range of specialities and care settings. This aims to support the ongoing work to update regional, national and international guidance and provides practical advice to support clinical decision making in both the acute and community care settings.

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Eliminating pressure ulcers

MAKING PU PREVENTION A PRIORITY

There is considerable emphasis at a strategic level across the whole of the UK to reduce the number of patients who develop a PU. The Harm Free Care initiative in England is described as a new mindset in patient safety. It focuses on how many patients had care that was free of harm, rather than on how many patients were harmed. Currently, the Harm Free Care initiative focuses on four main harms — PUs, falls, venous thromboembolism and catheter-associated urinary tract infections. The prevalence of these is measured each month using the National Safety Thermometer. Organisations can review the percentage of patients who received harm free care each month and also see the national picture (Health and Social Care Information Centre, 2013).

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 is used to incentivise improvement in outcomes and that providers focus on PU data. Based on the data collected in 2012/3, it is suggested that the median prevalence of PUs is 6.6% and based on data from the pilot work it is suggested that a 30–50% reduction in prevalence should be achievable (Delivering the NHS Safety Thermometer, 2012). However, there are many reasons why this is not straightforward.

In Scotland, HEAT targets support a zero tolerance to PU occurrence for 2013/4 (Royal College of Physicians of Edinburgh, 2013). In Wales, the 1000 Lives Plus campaign aims to prevent hospital-acquired PUs as part of the Transforming Care initiative (1000 Lives Plus, 2013). In Northern Ireland, the Patient Safety Forum and the Public Health Agency are working collaboratively with the five healthcare trusts, to advise on, influence and evaluate the direction of the Pressure Ulcer Prevention Program (Public Health Agency, 2012).

All of these initiatives utilise care bundles either as SKIN or SSKIN to focus healthcare staff on the key activities that it is widely believed will drive down PU occurrence (see Section 3). The bundles fit with what the Harm Free Care initiative describes as a small number of improvements in key processes delivered in a highly reliable way, which will result in harm free care. These should be easily implemented at a local level, integrating with existing workflows and routines rather than creating an additional burden of documentation.

An example of this has been the introduction of intentional rounding in acute organisations with regular and routine assessment of key factors for every patient throughout the day. While these initiatives are relatively easy to implement in an acute care setting, they do not lend themselves well to community care and alternatives need to be designed for staff caring for patients in their own homes. SSKIN bundles can be used in community care and good examples exist of this. For example, in Wales a video has been produced to support community staff and can be viewed at http://bit.ly/11WZTVr.

Commissioning bodies require that any category III or IV damage be reported as a Serious Incident (SI) — also known as Serious Incident Requiring Investigation (SiRi) or Serious Untoward Incident (SUI). These are reported in the Strategic Executive Information System (STEIS), which is to be replaced by the Serious Incident Reporting and Learning Framework (SIRL). Some areas are instigating fines for each episode of damage that occurs, with penalties varying considerably from £200 to over £2000. The remit for SIs has now passed to the new NHS Commissioning Board for England (NHS England).

This document aims to provide clinicians with best practice guidance in four key areas of pressure ulcer prevention, namely:

- Screening and risk assessment
- Pressure ulcer prevention strategies
- Preventing pressure ulcers in surgical patients
- Preventing pressure ulcers in neonates and paediatric patients.

In addition, it aims to provide up-to-date information on recording incidence and the challenges faced by clinicians in measuring PUs.

GUIDE TO USING THIS DOCUMENT

Each of the sections that follow offer advice about preventing pressure ulcers and, where appropriate, include a table with tips for application of best practice, namely:

- the optimum outcome
- the reason for, and how best to succeed in reaching this outcome
- how to demonstrate that best practice is being achieved.

In addition, each section identifies key points/challenges, and is supported by key references, where available.

SECTION 1: PREVALENCE AND INCIDENCE IN THE UK

DEFINING PREVALENCE AND INCIDENCE

The terms prevalence and incidence have very different meanings, however they are frequently (if incorrectly) used interchangeably. When reading and interpreting information, care must be taken to ensure the correct definition is being used to describe what has been counted. If discussing the generic practice of counting, it is possible to refer to pressure ulcer (PU) incidents or PU occurrences — these encompass both prevalence and incidence, but are not precise enough to be described as either prevalence or incidence.

Prevalence

Prevalence records the number of people who have a PU at any one time, so it includes those who have a newly developed PU and those with a pre-existing PU. Therefore it should not be used as a measure of the quality of care given in an area. Prevalence may be used to indicate workload or resource need, eg how many specialist beds are required or how many nurses are needed.

It should be noted that, strictly speaking, prevalence refers to the number of patients with a PU. However, many organisations record the number of PUs, which may overinflate the number as a single patient may have more than one PU — yet the number of patients from which the percentage is calculated remains constant. Therefore, if attempting to compare data, always clarify what was included (Figure 1). When presenting prevalence, it is becoming increasingly common to present two lots of data: the total prevalence (ie category I, II, III and IV) and the prevalence of category II, III and IV PUs.

Incidence

Incidence records the number of new PUs that occur within a given time period and thus may be seen as an indicator of the quality of care provided. As with prevalence, there is a lack of clarity regarding the counting of patients or new PUs and around the inclusion or exclusion of category I damage.

Recording incidence is more complex as there is considerable discussion around the point at which a 'new' PU may be attributed to the care setting within which it is noted, because there is no clear evidence or guidance which says how long a PU may take to evolve. Therefore if a patient is admitted to a care setting PU-free, but is noted to have a PU by the end of the first day, is that due to poor care in that setting or, more likely, due to the event that brought the patient into healthcare (eg a fall and being left on the floor for several hours)? To be accurate, each case should be judged individually by reviewing the patient's history and the quality of care provided. However, this is often not done and an arbitrary time-based cut-off used, eg six or 72 hours, with any new damage noted after that time being attributed to the care provider.

Prevalence and incidence in the acute setting

Using the published literature to gain accurate information on the number of people who develop a PU in hospital is difficult. This may be due to differences in the population characteristics, the grades of PU included and the time frames considered (Baharestani et al, 2009). In addition, there is some speculation that moisture lesions are included in some studies where they have been misdiagnosed as a category II PU (Defloor and Schoonhoven, 2004). Hence, using these studies to provide a baseline or to compare against your own organisation is not recommended (Baharestani et al, 2009).

Barbanel et al (1977) were the first to publish a UK prevalence study. This took place in Glasgow and included both hospital and community patients. They found a prevalence of 8.8% (category II to IV) of those people included in the study had a PU. They do not report the hospital-only prevalence.

Clark and Watts (1994) reported a hospital-acquired PU incidence of 4.03 per 100 admissions, while Vowden and Vowden's (2009a)

Key points:

1. Comparing prevalence and incidence studies is difficult due to differing definitions, grading and population characteristics.
2. Recent prevalence for all reported patients in acute, community and care home settings in England is 5.5%, with 1.34% being reported as being new PU.
3. Using prevalence to measure acute sector performance is not helpful, because it does not account for only those PU developed while in care. Incidence is a far more useful measuring tool.
4. Incidence of PUs in the acute sector in the literature is low, but may range from 1.17% to 4.03%.
5. PU prevalence of 6.6% in the community has been reported, with some community trusts achieving below 5%.

Figure 1: Presenting prevalence data

$$\text{Prevalence} \quad \frac{\text{Number of patients with PU} \quad 12}{\text{Total number of patients in the care setting} \quad 100} = 12\%$$

ambitious wound prevalence audit found that 0.71 patients per 1000 population of Bradford had a PU (category I to IV). Of these, only 11% (40 people) were located in hospital.

Vanderwee et al (2007) found a prevalence of 18.1% of patients with grade 1 to 4 PU and 10.5% with category II to IV in a European prevalence study of 25 hospitals in five countries.

Incidence can be used to demonstrate improvements in care by showing a reduction in the number of patients developing a PU within the acute setting. For instance, if every PU that develops in hospital is recorded, then every month this data can be compared with the next. Trends of improvement or deterioration can be detected over time (Padula et al, 2012).

Acute care settings can differ in size and speciality as well as the population 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 it is important that measurement of a new PU is considered.

Defining when a PU is hospital acquired is important, particularly in the current climate with financial incentives attached to prevention. Skin inspection on admission may not find any skin damage, but damage may become visible some days later (Farid, 2007). Gaining an accurate history is necessary to determine the point in time of PU occurrence (Tissue Viability Society [TVS], 2012). Equally, not all PUs can be prevented (National Pressure Ulcer Advisory Panel [NPUAP], 2010; TVS, 2012), so undergoing a root cause analysis to determine avoidability and cause is recommended (Black et al, 2011).

The NHS Safety Thermometer is the first national method for counting PUs and provides a monthly point prevalence figure. While this is not the favoured way of measuring PU occurrence (TVS, 2012), it is at least a start, and ensures organisations are counting PU occurrence and provides a low level of information regarding PU prevalence. In February 2013, the NHS Safety Thermometer provided a point prevalence in England of 1.34% new PUs in the total population submitted (177,370 patients) with a point prevalence of all PUs of 5.5% (Madsen, 2013). This population includes acute, primary care and some care home settings.

Prevalence and incidence in the community

Finding publications on PU incidence and prevalence is even harder in the community setting. The community faces the same challenges as acute in terms of accuracy of grading, unreliable detection or misdiagnosed moisture lesions and subjectivity, with a host of other barriers that make data collection very difficult.

Within the small number of published articles detailing prevalence in the community there is a wide variation in the numbers reported.

Oot-Giromini conducted a small study in 1993 looking at both prevalence and incidence of PUs in the community. A prevalence rate of 29% and an incidence rate of 16.5% were reported. Most of the ulcers found were grade 2 or 3 and occurred on the sacral/coccyx area, while 73% of the cohort was incontinent. This latter finding brings into question whether these rates were based on PUs alone, or a combination of moisture lesions and PUs.

Data reported in the best practice monograph for PUs in 2011 reported 4.4-33% in the community and 4.6-20.7% in nursing homes (Best Practice Monograph, 2011). The document 'Your Skin Matters' (2010) estimates 30% of community patients and 20% of nursing home patients develop a new PU, but also state that community data is unreliable as PUs affect an unknown proportion of the population in community services. Nursing home data should become more evident with the Commissioing Care Groups (CCGs) being responsible for the monitoring and reporting of PUs as a clinical incident to the NHS Commissioning Board for England.

Data from the NPSA (2009) showed a higher incidence of PUs in a community inpatient facility: 7.9 PUs per 10,000 bed days, compared to an acute inpatient facility which showed 3.3–5.5 PUs per 10,000 bed days, alluding to a more vulnerable patient population in the community setting.

Incidence collection in the community relies on large numbers of competent nurses who

have the motivation, stamina and knowledge to collect data (Benbow, 2004). In some areas a lack of standardised documentation and computer software due to the geographical spread, means that incidence data can only be collected and collated manually. The size of the Trust and the variable size of community caseloads often means this is an impossible task.

In addition, the community is made up of several subsections of population, and covers not only adult services, but children's, mental health, learning disabilities, rehabilitation services, prisons and nursing homes. Not all individuals with a PU will therefore be known to health services and collation of data in some areas is not as good as others, with problems of under reporting due to a lack of awareness (James, 2010).

Currently there are incident reporting systems in place in each health and social care setting such as Care Quality Commission, National Patient Safety Agency (NPSA) and Monitor; however the regulatory agencies do not triangulate this information giving a disjointed picture of PUs across the community.

Incident data is far easier to track in localised areas if data collection systems are in place. However this still relies on a dedicated person to analyse the information and validate it to ensure consistency and accuracy (Baharestani et al, 2009).

The Safety Thermometer provides a monthly snapshot of new or acquired pressure ulcers in each Trust (McIntyre, 2012). For the community, many questions have been raised regarding the completeness of the data capture as the day on which data is collated is always Wednesday. However, historically, most community nurses undertake their wound care on specific days of the week, which may not be on a Wednesday, resulting in a population of patients with wounds that will not be captured.

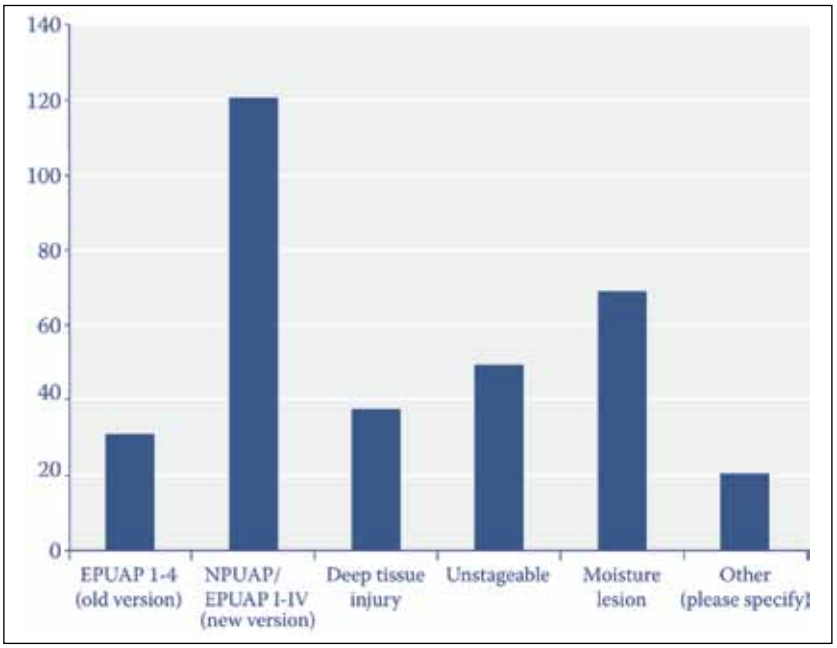
To get a true picture of community PUs would require data collection not only from NHS services, but collaborative working with care homes, the private sector, social and private care agencies, using standardised documentation and systems of reporting.

CREATING A COMMON LANGUAGE FOR COUNTING PUs

Using a common language when counting PUs is perhaps one of the most complex and frustrating issues in PU care. In the UK, there is little consensus on which grading system is used — or even if it is called a grading system, with the most recent terminology referring to categorising PUs.

A survey of 145 organisations in England in 2011 revealed that different versions of tools were in use, with 120 using the new 2009 version of the European Pressure Ulcer Advisory Panel (EPUAP)/National Pressure Ulcer Advisory Panel (NPUAP) tool and 25 using the old tool. However, many of them were also using additional categories, such as deep tissue injury or unstageable, and some were including moisture lesions in their PU data (Figure 2) (Fletcher, 2012a).

Figure 2. Various terms and systems used to classify pressure ulceration (Fletcher, 2012a)



This has major implications for the recording of PUs, with some organisations reporting many fewer category III and IV ulcers because they call them something else.

Other definitions are also open to interpretation. Table 1 shows how five organisations record deep tissue injury as part of their Safety Thermometer and Serious Incident recording. As can be seen, there is no consistency in how this is reported and each organisation provides

reasonable commentary on the advantages and disadvantages of their reporting system. Further best practice guidance is needed on how deep tissue injury is reported, as well as the need to appropriately define what an unstageable PU is.

The relevance of numerical classification could be questioned because the attribution of a number to the level of damage makes little, if any, difference to the care the patient receives (Fletcher et al, 2011). However, the correct identification of a wound as a PU has considerable implications for patient care.

For example, moisture lesions are not PUs and the care and management they require differs significantly to that required for a PU, with the main objective being to alleviate the cause of the damage (frequently incontinence). A pressure redistributing mattress will do little to help this, therefore using one for people with moisture lesions may be inappropriate (although it is acknowledged that their incontinence may increase their risk of developing a PU).

Inappropriate use of resources adds significantly to costs and may deprive or delay another patient who actually needs a mattress. In terms of allocating funding to the care of patients who develop pressure damage, perhaps the most important definitions are those for avoidable and unavoidable damage and the timeline cut off for when damage happened 'in your care'.

Several definitions of what is unavoidable exist, and the 2011 survey (Fletcher et al, 2011) identified that over 50% of the participating organisations were using one of them — however there was no consistency in what was used (Figure 3). Of more concern was the fact that 47 organisations did not have an agreed definition. Further best practice guidance is needed to define 'unavoidable' and for this to be recognised cross different Trust/health boards to ensure consistent collection of data.

While definitions exist, the issue is still contentious. Many believe each situation is completely individual, which leads to the definitions

Table 1: Deep tissue injury recording in five organisations (Fletcher, unpublished)

Methods	Advantages	Disadvanatages
Record on Datix as 'purple lesion' Wait and see if any doubt as to grade Check within 1 week Ask district nurse to check if discharged first	Does not increase category III and IV figures until actual damage known Clear for staff	Relies on accurate follow up Would need communicating to other Trusts if patient admitted for planned procedure
Grade as seen in line with EPUAP Grade may change once seen by TVN Wait and see only if unsure if a category II or a IV and until seen by TVN	DTI is reported	Variance from nurse error Need to re-report if initial grading wrong May appear to increase III and IV rates May lead to unnecessary root cause analysis
Technically put a category I and wait to see what it goes to Considering reporting as category III and removing from STEIS if it is not	Does not increase category III and IV figures until actual damage known DTI is reported	DTI isn't a category I ulcer; may confuse staff Increased work for risk management in removing from STEIS Timescales for removing from STEIS?
Don't report as no suitable category on Datix for them Reported when break down occurs	Does not increase category III and IV figures until actual damage is known Clear for staff	May not have suitable equipment if no overarching monitoring
Reported as category III and IV depending on nurses' assessment Not reported while staff wait to see what happens	DTI is reported in some areas	No clarity across the Trust Possibility of inaccurate category III and IV rates May not have suitable equipment if not reported May lead to unnecessary root cause analysis

DTI=Deep tissue injury; STEIS=Strategic Executive Information System; TVN=Tissue viability nurse

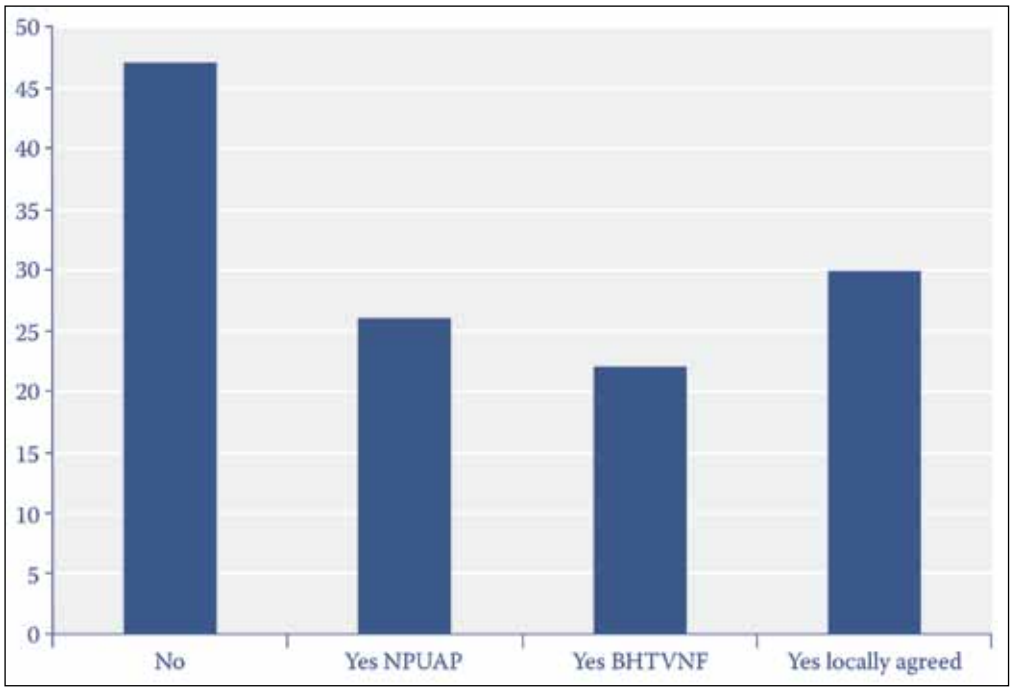


Figure 3. Do you use a definition of unavoidable? Adapted from Fletcher, 2012. Key: BHTVNF= Bedfordshire and Hertfordshire Tissue Viability Nurses Forum (2010); NPUAP=National Pressure Ulcer Advisory Panel (Black et al, 2011)

being applied with varying degrees of rigour by both provider organisations and commissioners. Payment associated with achieving quality targets and funding for episodes of care may depend on whether damage was avoidable and therefore should have been prevented.

The attribution of whether damage happened in an organisation's care is also complex and, like avoidability, should really only be decided on an individual basis following a full investigation and root cause analysis. Again, this is open to interpretation, with some organisations rigidly following timeline definitions, eg it happened later than six or 72 hours of being in our care, while others take responsibility for anything that was not noted on admission.

It seems that it is impossible to agree on standard definitions for many factors associated with PU prevention and management, yet it seems that these are mainly local issues with every organisation being protective of what it already has.

The time has come for healthcare providers to realise that there has to be compromise in order to speak a common language which unifies good quality patient care.

We should focus on important issues such as:

- Does the patient have a PU or not? — rather than whether it is a category I, II, III or IV, or other term
- Does it really matter where the PU occurred?
- Shouldn't we actually take on board the ethos of harm free care? A patient should not suffer harm wherever they are cared for.

This requires the implementation of appropriate screening and assessment of at-risk patients (including vulnerable adults), the implementation of a pressure ulcer prevention strategy for all patient groups that includes five essential elements to reduce the incidence of pressure ulcers (SSKIN) and standardised documentation using a common language.

SECTION 2: PU SCREENING AND ASSESSMENT

Protection of the individual patient from pressure damage is a fundamental aspect of nursing care. PU risk assessment using an appropriate tool is intrinsic to that care.

Healthcare professionals require specific training in PU risk assessment appropriate for the group of individuals within their care. Various groups have particular needs which their PU risk assessment tool should reflect in order to highlight the risk (Table 2).

While identification of vulnerable adults who lack the physical capability to protect themselves due to disability or co-morbidity is recognised in current risk assessment tools, these tools do not recognise people who lack the mental capacity to protect themselves, whether due to dementia, temporary delirium due to sepsis or mental health problems. If the vulnerable adult also has an acute illness, exacerbation of a co-morbidity or an acute injury, they may be especially vulnerable to pressure damage.

Currently there are no PU risk assessment tools available which solely address the issue of the vulnerable adult, their ability to comprehend the risk of pressure damage and to cooperate with care. This could be addressed by adding a section to pre-existing risk assessment tools (Table 3).

Key points:

1. All individuals on admission to a healthcare setting, hospital or nursing home should have an appropriate pressure ulcer risk assessment performed within six hours of admission to an acute setting (NICE, 2005), and thereafter daily.
2. All individuals admitted onto a community nurse caseload should have a PU risk assessment performed at the first visit and at regular intervals thereafter dependent on clinical need and, as a minimum, every three months.
3. Failure to perform an appropriate risk assessment and act to protect a patient constitutes neglect by the omission of care (Nursing and Midwifery Council, 2008).

Table 2: Pressure ulcer risk assessment tools

Specific population	Appropriate risk assessment tool
Paediatric patients	Glamorgan Tool (Willock et al, 2009) Braden Q Scale (Curley et al, 2003a)
Orthopaedic patients	Pressure Sore Prevention Score (Lowthian, 1989)
Older people	Pressure Ulcer Risk Assessment (Norton, 1962) Braden (Bergstrom et al, 1987)
Adults	**Acute:** Waterlow (1985) **Community**: Walsall Community Pressure Sore Risk Calculator (Chaloner and Franks, 2000)
Adults with mental health issues	None available
Critical care patients	Cubbin and Jackson (1991)

Table 3: Example of addition to an existing pressure ulcer risk assessment tool

Patient is able to comprehend the risk of pressure damage and is willing to comply with care	Score 0
Patient is able to comprehend the risk of pressure damage, but despite explanation is unwilling to comply with care	Score 10
Patient is unable to comprehend the risk of pressure damage and is unable to comply with care	Score 10

BPS APPLICATION TO PRACTICE: SCREENING AND ASSESSMENT OF PRESSURE ULCERS

Best practice statement	Reason for best practice statement	How to demonstrate best practice
Pressure ulcer risk assessment reduces the risk of pressure damage	Risk assessment provides early identification of individuals at risk of pressure damage	Document pressure ulcer risk assessment (and appropriate re-assessment) within the individual's healthcare records (Nursing and Midwifery Council, 2008)
An appropriate risk assessment tool should be used for the individual and their co-morbidities and age (Table 2)	The risk assessment tool should enable the healthcare professional (HCP) to identify the risk for particular groups of individuals. Using an inappropriate tool could inhibit risk identification	The appropriate tool will correctly identify the risk for the individual within a specific group and enable the HCP to act in preventing pressure damage Document tool used in individual's healthcare records and level of risk
All HCPs should undergo training in pressure ulcer risk assessment	The HCP has a responsibility to ensure they understand and employ risk assessment appropriately	Ensure regular mandatory training in risk assessment is organised by the employer with an attendance register Complete competency assessment
The clinical judgement of the informed HCP should also be employed in risk assessment	It is recognised that the perfect risk assessment tool does not exist and that both a formal tool and the clinical	Document clinical opinion together with the outcome of the risk assessment in the healthcare records
The risk assessment tool should inform the HCP of the level of risk to the individual	The level of recognised risk will direct the HCP in appropriate interventions regarding: • Pressure-redistributing equipment • Re-positioning schedule • Skin care • Involvement of others from the multidisciplinary team (MDT) • Appropriate verbal and written explanation to individual/family/carer	Document date and time of interventions made in the healthcare records Evaluate interventions and adjust the care plan as required
Pressure ulcer prevention strategies should be implemented within 6–12 hours (see Section 3)	Prompt implementation of strategy minimises the risk of pressure damage to the individual	Document the efforts made to obtain appropriate pressure-redistributing equipment and outcomes Refer to other HCPs in the MDT if necessary (eg dietitian)

SECTION 3: PU PREVENTION STRATEGIES

Once risk of developing a PU is established, the prevention strategy for that individual can be developed. This should be adopted for all patient groups.

The fundamental PU prevention strategy should always include all five elements of the SSKIN bundle:

- Support surface requirements
- Skin inspection
- Keep patients moving
- Incontinence/moisture management
- Nutrition and hydration assessment (NHS Scotland, 2009; NHS Midlands and East, 2012).

A SSKIN care bundle is constructed with the purpose of cementing all fundamental preventative components into a single unit of care that must be implemented for every patient, on every occasion that the patient is reviewed (Kiernan and Downie, 2011; Clarkson, 2013).

IMPLEMENTING A SSKIN CARE BUNDLE

A five point PU prevention strategy based on a SSKIN bundle (NHS Scotland, 2009; NHS Midlands and East, 2012) is outlined below.

Surface

Before putting in place any support surface, consideration needs to be given to what level of equipment is needed to redistribute or relieve pressure to prevent skin damage, and whether the individual spends most of their time in bed or seated. The surface element of the bundle must include:

- Identification and discussion of what equipment is to be used with the patient, relative and carer
- Accompanying written patient information to explain how to prevent PUs
- Evidence of whether the equipment in use is evaluated regularly to ensure patients have the right support surface.

Skin

Skin inspection to prevent skin damage, or to manage any existing skin breakdown, must be part of any PU prevention strategy (Figure 4). Skin fragility and vulnerability must be identified at each assessment of the patient's at-risk status. This includes not only checking the skin in vulnerable regions such as the sacral area, but also where skin comes into contact with medical devices. Any early skin changes must be documented and a plan to prevent further skin breakdown put in place. This includes:

- A repositioning schedule to remove pressure and shear off the vulnerable or affected area
- Skin cleansing to remove soiling and moisture — note that alkaline soaps should be avoided to protect the acid base of the skin (Proksch et al, 2008)
- Protection of vulnerable areas (eg bony prominences) using dermal gel pads or other pressure-redistributing devices to reduce and redistribute pressure away from critical areas. Barrier creams/films may also help to reduce friction (Benbow, 2012)
- Regular evaluation of the effectiveness of the skin protection plan, ie early skin changes such as blanching or non-blanching erythema are being detected.

Keep moving

A repositioning schedule must be in place with the aim of optimising independent movement, and change of position to relieve pressure. Individual repositioning requirements of the patient need to be discussed with all those involved, keeping the patient at the centre of the discussion.

Any position change needs to be comfortable and allow independence, where possible, for the patient while in that position. To achieve this, it may be necessary to involve other disciplines trained in this area, particularly occupational therapists. Any at-risk patient needs to have a repositioning chart in place, which is regularly reviewed to assess how often the patient needs to be repositioned.

In a literature review looking at PU prevention strategies, Ayello et al (2012) found turning clocks to be effective when used in conjunction with repositioning charts. They are a visual reminder for the patient and their carers that a change of position is due. An important consideration in any moving and handling of any patient is that a mobility risk assessment has taken place, and if pain is an issue that pain relief is addressed and evaluated as necessary.

Key points:

1. Timely risk assessment is essential (NICE, 2005), with the HCP using both a recognised risk assessment tool and clinical judgement (Compton et al, 2008).
2. A PU prevention care plan must be in place, addressing the following:
   - Support surface requirements
   - Skin inspection and management of any cause of moisture to the skin
   - Repositioning with a plan in place for both the in-bed and seated individual
   - Nutrition and hydration needs.
3. Regular evaluation and adaption of the plan, with patient and family involvement, must be carried out at each delivery of care.

Figure 4: Skin inspection is an important part of risk assessment. Non-blanchable redness of the skin that does not reduce when light pressure is applied to the area is an early sign of pressure damage.

Incontinence and moisture

The impact of incontinence, or any form of extrinsic moisture, can lead to the breakdown of vulnerable skin (Beeckman et al, 2009). To address this, the patient's elimination needs must be assessed, with the following taken into consideration, and managed as appropriate:

- To contain and address cause of any incontinence
- To manage sweat or any exudate to the skin
- Establish a skin care routine with timely cleansing of soiled and wet skin.

All of these elements must be re-assessed regularly and adapted as necessary. In addition, there may be a need to refer or seek advice from the local incontinence advisor.

Nutrition and hydration

It is essential that the patient's nutrition and hydration status is assessed to ensure patients have the right diet and plenty of fluids. This should start with a nutritional assessment using a recognised tool such as the Malnutrition Universal Screening Tool (MUST; National Collaborating Centre for Acute Care, 2006). The completion of a MUST score can guide staff in what intervention needs to be put in place for the patient. This may range from simply making food and fluids available, encouraging people to eat well and drink regularly, assisting patients where necessary, or referral to a dietitian, where further interventions, such as supplements or tube feeding, may be added. The at-risk patient should be observed for signs of dehydration (Box 1), and if these are noted, then rehydration must be considered. This may need to be discussed with the doctor who is managing the inpatient or with the GP if the patient is in a community setting. The commencement of fluid and food charts can help to maintain good nutritional care.

Engagement with patient, family, carers and staff

Any PU prevention strategy needs to involve the patient, family and carers at its inception and at each evaluation. Strategies always need to include all five fundamental elements, and must involve flexibility for the care setting in which they are to be implemented, eg in the patient's own home. Equipment should be chosen for ease of use, the size of the room, the person who is using the equipment and how often carers visit the patient.

In addition, the key to any successful PU prevention strategy is staff engagement, excellent documentation and communication among the team managing the patient, and the patient. One way of achieving this is through encouraging personnel to become PU prevention or skin care champions in their area of practice, whatever the care setting (Ayello et al, 2012).

Box 1: Signs and symptoms that may indicate dehydration

- Dizziness or light-headed feeling
- Tiredness
- Headache
- Dry skin, mouth, lips and eyes
- Concentrated urine — colour will darken and the patient will pass only small amounts infrequently
- Possible confusion

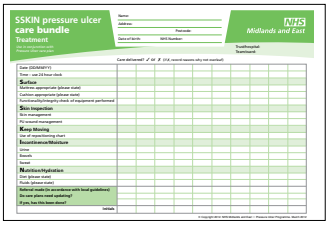


Figure 5: An example of a SSKIN care bundle can be found at http://www.stopthepressure.com/path/docs/Treatment%20bundle.pdf

BPS APPLICATION TO PRACTICE: PRESSURE ULCER PREVENTION STRATEGIES

Best practice statement	Reason for best practice statement	How to demonstrate best practice
Ensure PU prevention care bundle in place. This should comprise all five elements of SSKIN (Figure 5): 1. Surface — support patients 2. Skin inspection 3. Keep patients moving 3. Incontience/moisture 4. Nutrition/hydration	To facilitate fundamental PU prevention care, and that this care is given in a timely manner	Document that PU prevention care bundle is in place in healthcare records Provide evidence of documented evaluation of the PU prevention strategy in the care bundle Refer to MDT if necessary for advice
Ensure all five elements of care within the PU prevention care bundle are received by the patient	To prevent PU development and/or detect early signs of pressure damage	Give evidence that the care bundle is completed after each intervention Audit PU prevention care bundles locally with an agreed time frame for frequency of audits
Any PU prevention management strategy needs to involve staff, patient, family and carers at its inception and at each evaluation	To foster ownership and ultimately a successful PU prevention strategy	Document involvement of all stakeholders at each stage of care planning/intervention/evaluation Provide appropriate education to patients, family and carers

SECTION 4: PREVENTING PU IN SURGICAL PATIENTS

The incidence of PUs associated with surgery has been reported to be 14.3% (Lindgren et al, 2005), 15.6% (Nixon et al, 2000) and 21.2% (Schoonhoven et al, 2002a). This is much higher than the overall incidence reported for hospital patients, possibly indicating that the surgical patient is at an increased risk of PU development compared to other hospital patients. Several papers have attempted to determine the particular risk factors associated with surgery (Scott and Buckland, 2005).

The key risk factors for PU development are immobility, poor perfusion, reduced sensation, poor nutritional status, age and co-morbidities. The very nature of surgery renders patients immobile for the period of time of the surgery until recovery from the anaesthetic. This period of immobility may have been imposed preoperatively and may be extended postoperatively depending on the type of surgery performed. Anaesthetics render patients insensate, and can have an impact on the perfusion to the skin. The surgical environment can affect body temperature, and the surfaces the patient lies on may have a detrimental effect on skin integrity.

Many authors have explored the risk factors associated with surgery but each have often presented differing findings. The more recent papers are summarised in Table 4 (see page 14).

There is some inconsistency between the findings of the studies looking at risk factors due to surgery. However, it can be deduced that all patients having surgery should be considered at risk of PU development (Walton-Geer, 2009). Length of surgery time does seem to be a consistent factor. Obviously this risk cannot be changed but should be recognised and preventive measures put in place where possible, such as heel protectors. It is likely that low BMI and higher risk of mortality are both risk indicators; again there is little that can be done to influence either of those factors preoperatively.

Optimising health and maintaining normotension and normothermia during surgery seem to be important actions for anaesthetists and theatre staff to consider. The high impact action bundle to reduce surgical site infection (NICE, 2008a) includes maintenance of normothermia, so body temperature should be maintained. In some cardiac surgery where hypothermia is deliberately induced to enable the surgery, this potential for risk will need to be considered and the patient warmed immediately postoperatively.

Anaesthetics affect the haemodynamic status of the patient and local or spinal blocks render patients insensate which will increase their risk of PU development (Shah, 2000; Edwards, 2006).

Consideration will need to be given to the support surfaces and positions used during surgery. NICE (2005) recommends that a high-specification pressure-reducing foam mattress or other pressure-redistributing surface should be used on theatre tables as standard. The position needed during surgery may increase pressure over certain bony areas — for instance during spinal surgery the patient will be laid prone, increasing risk to the forehead and chin (Schoonhoven, 2002a). When in the supine position, the heels (Huber, 2013) and sacrum are at increased risk (Figure 6). The use of special protection devices may offload pressure over these areas.

Keypoints:

1. The surgical patient is at particular risk of PU development.
2. Risk assessment and skin inspection should start preoperatively and be maintained postoperatively.
3. Theatre mattresses should be a high-specification pressure-reducing foam or other redistributing surface.
4. All staff involved in the care of the surgical patient should be alert to the risk of developing PU and special protection devices used to prevent pressure damage over bony prominences.
5. Normothermia should be maintained perioperatively, if the surgery type allows this.

Figure 6: Pressure damage to left heel following surgery. This may be prevented by using heel protectors (either foam or gel pads).

Table 4: Recent papers examining the risk factors associated with surgery

Authors	Title	Methodology	Findings
Nixon et al, 2000	Prognostic factors associated with pressure sore development in the immediate postoperative period	446 patients participating in a sequential, double triangular, randomised, blinded, controlled trial of the intraoperative use of a visco-elastic polymer pad conducted at two centres	The probability of PU development was associated with increased number of hypotensive episodes and a higher mean core temperature during surgery, and reduced mobility on day 1 postoperatively.
Scott et al, 2001	Effects of warming therapy on pressure ulcers — a randomized trial	A randomised controlled trial including 338 patients to compare intraoperative warming vs standard care on the incidence of PU development	Intraoperative warming reduced the risk of PU development. Low BMI and high mortality rate were indicators of increased PU risk
Schoonhoven et al, 2002a Schoonhoven et al, 2002b	a) Incidence of pressure ulcers due to surgery b) Risk indicators for pressure ulcers during surgery	Prospective study of 208 patients from nine surgical specialities with surgery lasting more than four hours	Over half (52.9%) of PUs developed on the heels. Patients undergoing cardiac surgery had a higher incidence of heel PUs. Patients undergoing head and neck surgery had a higher incidence of sacral PUs. Length of surgery was the only risk indicator
Lindgren et al, 2005	Pressure ulcer risk factors in patients undergoing surgery	Prospective comparative study of 286 adult patients undergoing surgery over a three-year period	Significant findings were older age, low serum albumin, female gender, lower BMI and lower weight. Patients with epidural/spinal anaesthesia were more likely to develop a PU, but they were also more likely to be older and have a fracture
Karadag and Gümüskaya, 2006	The incidence of pressure ulcers in surgical patients: a sample hospital in Turkey	A prospective descriptive study of 84 patients not at risk of PU development (according to Braden Scale) preoperatively, having a surgical procedure with general anaesthesia, lasting more than two hours	54.8% developed category I PU with 97.9% developing within first three postoperative days. 85.7% were at risk of PU development in first eight hours postoperatively. Preoperative risk assessment score is not an indicator of risk for surgical patients
Fred et al, 2012	Intraoperatively acquired pressure ulcers and perioperative normothermia: a look at relationships	Retrospective notes analysis over a three-year period of patients who developed a PU after surgery of longer than 60 minutes	PUs more likely to occur in the critically ill, lower weight patients, and in those with a low Braden score and temperature drop
Tschannen et al, 2012	Patient-specific and surgical characteristics in the development of pressure ulcers	Data from electronic medical records of 3225 patients receiving surgery over a 10-month period	Significant risk factors were multiple surgeries, low BMI, risk for mortality, length of surgery time and number of vasopressors

BPS APPLICATION TO PRACTICE: PREVENTION OF PRESSURE ULCERS IN THE SURGICAL PATIENT

Best practice statement	Reason for best practice statement	How to demonstrate best practice
All staff involved in the care of the surgical patient from pre-assessment to postoperative recovery need to be aware of the risk of PU development and be vigilant to their prevention at all times	Surgical patients are at higher risk of PU development than many other patient groups in the surgical setting	Use of care pathways for the surgical patient that reference the need for risk assessment and preventative strategies for the surgical patient. These should begin preoperatively and continue until the patient has recovered their usual independent status
Theatre table must be of a high specification pressure reducing foam or other pressure redistribution surface	Patients cannot be repositioned during surgery and length of surgery time cannot be influenced. Optimising the pressure reducing surface reduces risk for patients	Demonstrate that theatre tables have surfaces that meet the NICE (2005) standard
Monitor patient's temperature during all phases of the surgical procedure. When required, maintain normothermia using a forced air warming device perioperatively	There is some evidence to suggest that hypothermia during surgery may be linked to PU development	Document the use of a forced air warming device in the perioperative period and record temperature before induction and every 30 minutes perioperatively (NICE, 2008b)
Use of specialised protective devices during surgery to reduce pressure over high-risk areas	Depending on position of during surgery, some bony prominences may be at increased risk during surgery	Document perioperatively which protective devices have been used and where
Where lower limb block or epidural is used, heel protection must be worn	Heels are particularly vulnerable to pressure damage when spinal or epidural anaesthesia is used	Document perioperatively which heel protection devices are used
High frequency skin inspection of bony prominences lain upon during surgery for early detection of erythema	Surgical patients are at particular risk of showing signs of pressure damage in the first three days postoperatively	Document perioperatively what position the patient was laid in during surgery. Postoperative care plans should include evidence of skin inspection and document that skin is inspected as frequently as the patient's condition allows. All opportunities to inspect the skin must be taken and documented in the individual's healthcare records
Maintain normotension during surgery where the surgery allows this	There is some evidence to suggest that hypotension during surgery may increase the risk of PU development	Evidence that anaesthetists are aware of this additional risk factor and document action taken to maintain normotension during surgery. Postoperatively care pathways include evidence of monitoring of blood pressure

SECTION 5: PREVENTING PUs IN NEONATES AND PAEDIATRIC PATIENTS

WHY THE VERY YOUNG ARE AT RISK

There are some significant differences in the skin of young children and adults. Skin provides the first line of defence against the external environment by providing a physical barrier. It prevents excessive water loss from the body, prevents the entry of pathogenic microorganisms and minimises the absorption of harmful substances (Voegeli, 2010). The skin has two main tissue layers, the epidermis and the dermis.

The epidermis is the outer layer of the skin and its main function, particularly the stratum corneum, is to provide a barrier. The thickness of the stratum corneum on the forearm of 6—24-month-old infants has been observed to be on average 30% thinner than that of adults (about 7µm in infants and 10µm in adults) and the supra-papillary dermis is 20% thinner (Stamatas et al, 2010). The epidermis has no direct blood supply and receives nutrients and oxygen by diffusion from the blood supply in the dermal papillary layer (White and Butcher, 2006).

At the interface between the epidermis and the dermis is the basement membrane. This is made mainly from collagen and provides a secure foundation for basal keratinocyte cells. The basement membrane is attached to the dermis by collagen-anchoring fibrils. In the premature infant, the dermo-epidermal junction is flat, but it develops with age, the epidermis becoming thicker as more cells differentiate into the stratum corneum. The basal layer increases in area and heaps up into undulations at the dermo-epidermal junction to a deeply ridged zone that make up rete ridges (epidermal thickening extending downwards between dermal papillae; Evans and Rutter, 1986). These ridges prevent the skin layers pulling apart under friction.

Pre-term infants, less than 30 weeks' gestation, have only two to three layers in the stratum corneum, compared with 10–20 layers in term infants and adults. The fibrils that connect the epidermis to the dermis are also fewer (Lund, 1999). When using adhesive tape, adhesion between the epidermis and tape can be stronger than the bond between the epidermal and dermal layers in neonates' skin, and this can result in stripping of the epidermal layer when tape is removed (Kuller, 2001; Butler, 2006), and there is greater potential for blistering from friction and trauma. Friction injuries can occur when skin surfaces such as knees and elbows rub against bedding (Lund, 1999).

PU prevalence rates as high as 27% in paediatric intensive care units and as high as 23% in neonatal intensive care units have been reported. Most PUs occur within two days of admission. Among non-critical hospitalised paediatric patients, prevalence rates of 0.47% to 13%, and incidence rates of 0.29% to 6% have been cited (Baharestani and Ratliff, 2007). PUs in children can leave scars. These are particularly distressing and obvious on the head as hair fails to re-grow, resulting in scarring alopecia (Gershan and Esterly, 1993; Kumar and Kumar, 1993), which may not have resolved years after the initial insult (Neidig et al, 1989).

Detrimental changes in body image can make children withdrawn and have a negative effect on socialisation and education (Kozierowski, 1996). PUs are painful, and if severe, may need repeated skin grafting (Matsumura et al, 1995). Infection in these ulcers is not uncommon (Brook, 1991), and can spread to other tissues including bone, resulting in osteomyelitis (Dubey et al, 1988; Bar-On et al, 2002).

DEVICE-RELATED PUs

Any device, equipment or hard object pressing or rubbing on a child's skin for long enough and with enough pressure can cause skin damage (Table 5). 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). Although skin damage related to medical devices is mainly superficial (category I and II), it can be painful and cause distress to patients, and if action is not taken could progress to deeper tissue injury (Figures 7 and 8, page 19).

Preventing device-related PUs is often more complex than preventing PUs over the usual

Key points:

1. The neonatal skin is fragile and thin and needs gentle care to prevent damage.
2. Pressure ulcers in children can leave scars and may have a lasting detrimental impact on their quality of life.
3. Children and infants are particularly vulnerable to pressure ulcers associated with medical devices (around 50% of PUs in children and infants are device-related).
4. Consideration should be given to products that prevent damage to the skin under medical devices and care should be taken when positioning the device and the patient.
5. There are a number of risk assessment tools for paediatric PU prevention which have been adapted using adult scales.

anatomical sites (eg heel and sacrum). This is because the device causing the damage is an essential part of the patient's treatment. Paediatric patients in particular may be at risk due to their inability to sense devices properly (Fletcher, 2012b). Healthcare professionals should be aware of the potential for injury before it occurs, and protect skin. Some intravenous cannula fixation devices come with small pads to place under the wings of the cannula to prevent pressing on the skin. Devices such as pulse oximeter probes should be moved at least every two hours.

Protecting fragile skin under devices

Skin should be inspected under equipment and protected if possible. Consideration should be given to products that redistribute pressure and shearing forces, but do not inhibit the primary function of the device. For

Table 5: Medical devices and equipment associated with pressure damage

Equipment type	Evidence
Cable	Schlüer et al, 2009
Cerebrospinal fluid shunt	Curley et al, 2003b
CPAP/BiPAP mask	Razmus et al, 2001; Curley et al, 2003b; Dixon and Ratliff, 2005; do Nascimento et al, 2009
Delivery forceps	Waterlow, 1997
Diathermy pad	Willock et al, 2005
Electroencephalogram electrodes	Noonan et al, 2006
Endotracheal tube	Razmus et al, 2001; Curley et al, 2003b; Willock et al, 2005
Intravenous catheter hub	Willock et al, 2005; Noonan et al, 2006
Intravenous infusion splint	Waterlow, 1997; Curley et al, 2003b; Razmus et al, 2008
Intravenous infusion tubing	Waterlow, 1997; Curley et al, 2003b; Razmus et al, 2008
Nappy tag	Waterlow, 1997
Nasal prongs	Groeneveld et al, 2004; Razmus et al, 2008; do Nascimento et al, 2009
Nasogastric tube	Willock et al, 2005
Neck roll	Waterlow, 1997
Orthopaedic devices	Okamoto et al, 1983; Müller and Nordwall, 1994; Matsumura et al, 1995; Waterlow, 1997; Samaniego, 2002; Terzioğlu et al, 2002; Samaniego, 2003; McGurk et al, 2004; Willock et al, 2005; Noonan et al, 2006
Pulse oximeter probe	Razmus et al, 2001; Curley et al, 2003b; Noonan et al, 2006; Razmus et al, 2008
Sling	Willock et al, 2005
Splint	Schlüer et al, 2009
TED anti-embolism stockings	Willock et al, 2005
Tracheostomy	Razmus et al, 2001; Curley et al, 2003b
Tube	Schlüer et al, 2009
Urinary catheter	Razmus et al, 2001; Curley et al, 2003b
Ventilator headband	Willock et al, 2005

example, the use of a dermal gel pad can help to reduce pressure (Fletcher, 2012). Thin dressings and/or barrier products can help to reduce moisture, friction and shear. It is important to ensure that the child or infant does not lie on equipment such as tubes or cables. Correct positioning of the device using appropriate fixation is important. As little adhesive tape as possible should be applied to the skin of neonates and pre-term infants and care should be taken when removing the tape. If necessary, water-based solvents should be used in preference to organic solvents to soften the adhesive. Silicone tapes, which are breathable, have a low friction surface and are gentle on removal can be considered.

Guidance/protocols for paediatric risk assessment

Thirteen published paediatric PU prevention tools have been identified (Table 6). Seven of these were developed using adult risk assessment scales and only two were developed using data on patient characteristics. Risk assessment tools that include advice on prevention advocate frequent skin inspection, repositioning and use of pressure-redistributing surfaces for children and infants at high risk of PU. Some risk assessments also highlight the risks of skin damage associated with equipment and devices (Cockett, 1998; Waterlow, 1998; McGurk et al, 2004; Willock et al, 2009; Galvin and Curley, 2012).

Table 6: Paediatric pressure ulcer prevention tools

Pressure ulcer risk assessment/prevention tool	Authors	Validation/comments
Paediatric risk assessment chart	Bedi, 1993	For use in paediatric intensive care. Used headings from adult Waterlow scale
Braden Q pressure ulcer risk assessment tool for children	Quigley and Curley, 1996	Adapted from the adult Braden Scale. Validity tested in paediatric critical care
Patient assessment tool for assessing patients at risk for development of pressure-related breakdown	Garvin, 1997	For use in paediatric critical care. Similar to adult Braden Scale
Neonatal Skin Risk Assessment Scale (NSRAS)	Huffines and Logsdon, 1997	Adapted from the adult Braden Scale. Validity tested in neonatal care
Derbyshire Children's Hospital Paediatric Risk Assessment Score	Pickersgill, 1997	Adapted from adult Medley and Waterlow scores
Paediatric score	Cockett, 1998	For use in paediatric critical care. Developed from literature review. Not predictive
Pattold pressure scoring system	Olding and Patterson, 1998	Developed for paediatric critical care
Paediatric Pressure Sore/Skin Damage Risk Assessment Form	Waterlow, 1998	Developed from descriptive analysis of patient characteristics data from incidence study. Not predictive
Northampton neonatal skin assessment tool	McGurk et al, 2004	Developed for neonatal care
Northampton children's skin assessment tool	McGurk et al, 2004	Developed for general paediatric areas
Starkid Skin Scale	Suddaby et al, 2005	Adapted from the Braden Q scale
Glamorgan Paediatric Pressure Ulcer Risk Assessment Scale	Willock et al, 2009	For use in all paediatric areas apart from pre-term neonates. Developed from statistical analysis of patient characteristics data. Only items associated with PUs reaching significance ($p>0.01$) included in the scale. Validity testing with general paediatric patients and critical care patients
Braden Q+P	Galvin and Curley, 2012	For use in operating department. To be used with Braden Q scale

Figure 7: Pressure damage in an 18-month old child who had an IV cannula in the foot. This was securely bandaged, with the wings of the cannula, tape used to hold it in place and the IV tubing causing pressure damage.

Figure 8: The foot of the child 10 months later showing residual scarring from the pressure damage caused by the IV cannula.

Note: Device-related PUs may occur in all patient groups, not just neonates and paediatric patients. A significant proportion of PUs in critically ill and immobile adult patients are related to the use of medical devices. These are not always avoidable and require new techniques to help reduce or prevent skin damage, including the use of special protection devices such as dermal gel pads (Fletcher, 2012b).

BPS APPLICATION TO PRACTICE: PREVENTION OF PRESSURE ULCERS IN NEONATES AND PAEDIATRICS

Best practice statement	Reason for best practice statement	How to demonstrate best practice
The use of adhesive tape on the skin of pre-term infants should be avoided or kept to a minimum. Consider silicone tape.	Removal of adhesive tape can result in stripping of the epidermal layer (Kuller, 2001; Butler, 2006)	Document use of non-adhesive devices (eg silicone tape), or use of adhesive tape on clothes, such as hats, instead of directly onto skin
Friction injuries on pre-term infants' skin should be prevented	Friction injuries can occur when skin surfaces such as knees and elbows rub against bedding (Lund, 1999)	Document skin inspection of pre-term infants every time baby observations are undertaken. Document any erythema. Use soft bedding and protect vulnerable areas of skin
All children in hospital and in community care should have a PU risk assessment using a tool designed for paediatrics	Risk assessment tools designed for adult areas may not be appropriate or valid when used for children and infants	Document use of paediatric PU risk assessment tool that is suited to the child's speciality/area
The areas of skin in contact with devices and other hard objects should be inspected at least two hourly. The position of any devices should be changed before, or at the first sign of skin redness. Skin should be protected from direct pressure where possible	Medical devices are a major cause of pressure injury and skin damage in children	Document devices in contact with the child's skin, the date and time skin is inspected, and any action taken such as changing the position of the device or protecting vulnerable skin from contact pressure with a dermal gel pad, thin dressing or other suitable bandage
Immobile children should be provided with support surfaces designed for their age and weight	Adult support surfaces may be inappropriate and harmful for small children	Consult manufacturer's specifications when using equipment to ensure it is appropriate for the child's age, size and weight

SECTION 6: REDUCING PU INCIDENCE BY MEASURING IMPROVEMENTS IN CARE

TOOLS FOR MEASURING AND RECORDING

As all four nations of the UK are seeking to reduce PU occurrence through better implementation of risk assessment tools and prevention strategies (eg SSKIN), it is imperative that good mechanisms for measurement are in place. The National Quality Board (2013) has recently stated that generally in the NHS there is: "A lack of consistent definitions to enable NHS personnel and patients to unambiguously recognise clinical situations and conditions. This is combined with a lack of relationship to the equivalent data definitions in the reference terminology that computers use in the electronic record."

Collecting information on PU occurrence requires a considerable amount of effort and should only be undertaken if there is a clear plan to do something useful with the data, ie improve the quality of the care given to patients. It should be used for improvement rather than judgement.

Deciding the purpose of collecting PU occurrence data should inform what is collected, how and by whom. Reporting the prevalence of ulcers 'up the chain' often results in a lack of ownership of the issue in the area where the damage occurred. Mechanisms such as the Safety Cross which shows local level (ward, clinic or unit) occurrence is often more useful in driving change in practice as clinicians can see and own the information. The Safety Cross records PU-free days, but also allows the recording of inherited harm, ie patients who were admitted with a PU, so both quality of care and resource requirements can be seen (Figure 9).

Currently the main mechanisms of collecting PU occurrence are:

1. Collection of prevalence data on an episodic (eg yearly) basis
2. Collection of incidence data
3. Collection of national prevalence data via Safety Thermometer
4. Collection of incidence of particular grades of PU via Serious Incident (SI) recording
5. Collection of days free of PU using Safety Crosses.

Challenges and solutions

Much has already been written about the complexities of this data (Bahransteini et al, 2009; International Guidelines, 2009; Fletcher et al, 2011; Downie and Guy, 2012; Dealey et al, 2012; Fletcher 2012a), and how this results in data which are not even vaguely comparable. Yet it seems organisations are still driven to compare themselves with others, which serves little, if any, purpose until we can agree on key definitions and consistent and reliable ways of collecting information.

It is easy to reduce the prevalence of PU by 50%, simply by not counting all the category I (non-blanching erythema), or ensure that all the PUs counted are PUs and do not include moisture lesions, incontinence-associated dermatitis, leg ulcers and trauma. However, that does not improve the care the patients with those wounds receive — it simply makes the numbers look better.

One of the most commonly quoted figures for prevalence is that from the EPUAP survey in 2002, which identified that the prevalence of PUs across five European countries was 18.1% and in the UK the prevalence was 21.9% (Vanderwee et al, 2007). The recent Safety Thermometer data suggest that the median prevalence of PUs (for 2012/3) is only 6.6% (Delivering the NHS Safety Thermometer, 2012). There have either been considerable improvements in care, or the information being collected is not the same.

It is imperative that debate is undertaken across the UK to agree key definitions (or at least variations on definitions) and that organisations and publications are transparent about which of these they are using. It should be agreed:

- How to categorise pressure damage — or whether we should categorise damage at all
- To separate out moisture lesions from datasets
- What categories of damage to report
- How to determine when harm occurred
- How to report damage that is 'difficult' ie unstageable or deep tissue injury
- What is truly unavoidable — and the expectations about how this is determined.

Key points:

1. It is important to have good systems for measurements in place.
2. Measurement should be used to improve quality of care given to patients.
3. The Safety Cross can be used to record the number of PUs within different care settings.
4. It is important to agree on key definitions and to put in place consistent and reliable ways of collecting information.
5. Further clarification on what should be classified as 'unavoidable' is needed.

What percentage should we expect to be unavoidable? Is 95% still reasonable when so much effort is being put into prevention? Surely the only PUs that are still occurring will be the unavoidable ones. Recent local data from reviews of root cause analysis data suggest that now between 22 and 30% of PUs reported (category 3 and 4) are unavoidable.

- What is included, both in terms of patients and wounds. Do we include very small lesions (ie less than 5mm), heel ulcers on diabetic patients, wounds caused by devices such as masks and plaster of Paris, PUs in those at end of life?
- Quite crucially, are we counting patients or are we counting PUs? The numbers differ considerably.

However, if the focus is to improve the quality of care patients receive, then organisations need to really consider what their main problems are and then focus their efforts on reducing them by setting appropriate targets. For example:

- Ensuring the quality of the data – are all PUs validated by a specialist? Research shows that nurses frequently categorise PUs incorrectly and also will often include wounds that are not PU (leg ulcers, surgical wounds etc) (Fletcher, unpublished). This is often challenging in the community setting due to the geographical spread and size of caseloads
- Achieving a reduction in a specific type of PU; for example heel ulcers or device-related PU
- Achieving a reduction in new PUs (although it must be remembered a percentage of these will be unavoidable, so a realistic target must be set)
- Identifying a baseline dataset for moisture lesions. There are large numbers of these, they cause patients pain and distress and use a large amount of resources — but we do not know how many there are
- Achieving an increase in days between PU occurring — this is only suitable for areas such as mental health or women's services, where a very low rate of occurrence (and therefore a nil return on most surveys) would be expected. More recently, areas that have worked incredibly hard to reduce the incidence of occurrence can also use this type of information, while wards and other clinical areas have been using the Safety Cross to record how many days since they last had a new PU occur.

Organisations should also look at where their inherited PUs are coming from and work closely with those organisations and sectors. PU damage can occur anywhere and the focus very clearly emphasised by the new Clinical Commissioning Board is that we have to think of the whole health economy and stop being protectionist and working in silos.

A patient may develop a PU in the private sector, but if problems occur they will become an NHS patient. Therefore we should ensure that any education, resources and audit are offered equally across all sectors.

It is known that the reason many patients present to healthcare is because of a complication such as a PU, having never had any previous input from an healthcare professional. It is therefore vital to ensure engagement with social care staff, as they may be seeing these people more often than healthcare professionals, and also raise awareness with patients and the general public as to the risks related to PUs.

PUs will remain as an indicator of quality of care in all four nations of the UK. This is great news as it raises the profile of this largely preventable complication, yet it is imperative that the numbers are seen in context and not simply used to compare organisations or to alter funding.

The focus has to be on improving the care that patients receive and aiming to give them an experience that is harm free. This will not be easy, but is a challenge worth taking. We should be measuring improvements in patients' health and wellbeing — not targets. (Department of Health, 2010a; 2010b; 2010c).

Figure 9: Safety Cross. Each box should be coloured in as follows: green = no PU found; orange = admitted with PU; red = new PU found. This can be downloaded from: http://www.patientsafetyfirst.nhs.uk/ashx/Asset.ashx?path=/PressureUlcers/Pressure%20ulcer%20Safety%20Cross.pdf

APPENDIX 1: HOW GUIDELINES IMPACT ON CURRENT PRACTICE

There are a number of clinical guidelines on PU prevention and treatment available for practitioners working in the UK. We highlight the key national and international guidelines, all of which are in the process of being updated to reflect changes in evidence. This Best Practice Statement on *Eliminating Pressure Ulcers* can be used in conjunction with existing guidelines to provide optimal care for patients, whatever their age.

NICE PRESSURE ULCER GUIDANCE

NICE have previously developed two guidelines to promote evidence-based practice nationally for the intended benefit of all patients 'at risk of' or who have developed a PU. CG7 (Pressure Ulcer Prevention) was published in 2003 and CG29 (Pressure Ulcers) in 2005. As part of the normal NICE review/update cycle, these two guidelines are currently being updated and amalgamated to form one new document with an anticipated publication date of Spring 2014. For more information on the NICE guideline development process please visit: http://www.nice.org.uk/Guidelines-Manual.

The scope can be found at: http://guidance.nice.org.uk/CG/Wave25/17/Scoping/Scope/pdf/English. This has been agreed as follows:

Population groups that will be covered:

- People of all ages. Subgroups that are identified as needing specific consideration will be considered during development but may include:
  - People who are immobile
  - People with neurological disease or injury (including people with multiple sclerosis
  - People who are malnourished
  - People who are morbidly obese
  - Older people.

Healthcare settings included:

- Primary care settings, such as general practices, health centres and polyclinics.
- Community care settings (including the persons' home) where NHS healthcare is provided or commissioned.
- Secondary care settings where NHS healthcare is provided or commissioned.
- This guideline is commissioned for the NHS, but people providing healthcare in other settings, such as private care, may find the recommendations relevant.

Clinical management issues to be covered:

- Risk assessment, including the use of risk assessment tools and scales
- Skin assessment
- Prevention, including: moisture lesions and the use of barrier creams; pressure-redistributing devices (including mattresses, cushions, sheepskins, overlays, beds, limb protectors and seating); skin massage/rubbing; positioning and repositioning; nutritional interventions (including hydration) as preventive strategies for people with and without nutritional deficiency; patient and carer education, including self-assessment education and training for healthcare professionals
- Assessment and grading of pressure ulcers
- Management, including: debridement — autolytic, mechanical and larval therapy; pressure-redistributing devices (including mattresses, cushions, sheepskins, overlays, beds, limb protectors and seating); nutritional interventions (including hydration) for people with and without nutritional deficiency; antimicrobials and antibiotics wound dressings; management of heel PUs
- Other therapies, including electrotherapy, negative pressure wound therapy and hyperbaric oxygen therapy.

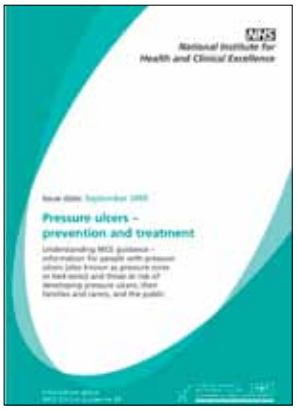
It is pleasing to see that the scope encompasses all the elements of SSKIN (see page 11).

Clinical issues that will not be covered

- Prevention and management of ulceration caused by ischaemia or neuropathy, venous leg ulcers, PUs caused by devices and Kennedy terminal ulcers.

Main outcomes looked for in the literature:

- Improved quality of life
- Reduction in adverse events



The NICE 2005 guidelines are available from: http://www.nice.org.uk/nicemedia/pdf/CG029publicinfo.pdf

- Improved prevention measures: reduction in proportion of people who develop new pressure ulcers.
- Improved management measures: reduction in pain; time to healing and/or rate of healing; increased proportion of ulcers healed; rate of change in ulcer.

Economic aspects

As with all NICE guidelines, both clinical and cost-effectiveness will be taken into account when making recommendations in the new document. A review of the economic evidence will be conducted and analyses will be carried out as appropriate. The preferred unit of effectiveness is the quality-adjusted life year (QALY), and the costs considered will usually be only from an NHS and personal social services (PSS) perspective. Further detail on the methods can be found in 'The guidelines manual' (see 'Further information' www.nice.org.uk).

Summary

The importance of this and all NICE guidance cannot be overstated as they aim to promote evidence-based practice. While predominantly written for use throughout the UK, they are widely adopted and referred to both nationally and internationally. In addition, they are often used to provide an evidence base for individual trusts/healthcare settings to develop their own specific guidelines; allow relevant care to be audited against a 'national standard'; and promote further education relevant to the subject matter about which the guideline has been developed.

NPUAP-EPUAP GUIDELINES ON PRESSURE ULCER PREVENTION AND TREATMENT

The 2009 NPUAP-EPUAP PU guidelines brought together over 70 experts from a wide variety of professional backgrounds to create the first evidence-based guidance applicable for both the United States and Europe (NPUAP/EPUAP, 2009). The process of developing these guidelines took over four years and reflects the considerable investment of time both organisations made in creating recommendations based on all relevant PU publications available to the end of 2008.

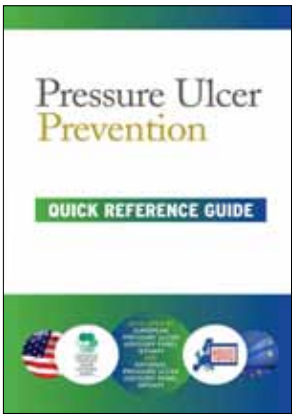
The prevention guidelines have been translated into 18 languages and the treatment guidelines into eight languages, suggesting a wide dissemination of the documents globally. To date, there has been no published evaluation of the implementation of the joint guidelines on outcomes such as PU incidence and prevalence, nor has there been reports of increased utilisation of the care processes recommended in the guideline documents. The lack of formal published evaluations may mark the relatively short time since the release of the guidelines.

NPUAP and EPUAP have committed to a five-year interval between updates of the guidelines with the first update scheduled for 2014. The updated guideline is being produced by the NPUAP, the EPUAP and a new partner organisation, the Pan Pacific Pressure Injury Alliance. This latter group brings expertise from Australia, New Zealand, Hong Kong and Singapore to the review of literature and the development of updated practice recommendations. The Japanese Society for Pressure Ulcers is represented by an observer. The new partners working on the guidelines will help to bring a broader global dimension to the update and it is hoped that other organisations will wish to formally participate in the development of the 2019 guideline update and beyond.

The new guideline update involves over 25 working groups tasked with reviewing all PU-related publications since the last guidelines. These groups are working on more than 3000 PU publications that have entered the world literature since 2008. Of the large pool of potential new studies, over 500 have been assessed as eligible for full review and thus will potentially contribute to the guideline recommendations.

The large volume of new publications is both encouraging and disheartening, depending upon one's perspective. It is encouraging to see an expanded interest in PU leading to more, and hopefully higher quality studies available to guide practice. It is disheartening for individuals trying to remain ahead of relevant publications. At a publication rate of almost 12 new articles per week, it is unlikely that any individual can keep abreast of all relevant new information.

The formal review of the PU literature every five years may be the most efficient approach to maintaining knowledge and practice up to date in a rapidly expanding field of enquiry. During 2013, all individuals, organisations and commercial companies with interests in PU prevention and treatment will be able to follow the



The EPUAP/NPAUP guidelines are available from: http://www.npuap.org/wp-content/uploads/2012/02/Final_Quick_Prevention_for_web_2010.pdf

Note: The All Wales Tissue Viability Nurses Forum have produced a guidance document on PUs. *The Essential Elements of Pressure Ulcer Prevention and Management* is based on the 2009 NPUAP-EPUAP document and provides assistance for practitioners working in Wales. These guidelines are available for download at: welshwoundnetwork.org/all_wales_guidance_for_the_prevention_and_management_of_pressure_ulcers.pdf

guideline development process and contribute comments and information to the Guideline Development Group by registering as a stakeholder at www.internationalguideline.com.

NATVNS (SCOTLAND) BEST PRACTICE STATEMENTS

The National Association of Tissue Viability Nurses in Scotland (NATVNS) drafted two Best Practice Statements in 2002 and 2005, which were endorsed by NHS Quality Improvement Scotland (NHS QIS).

In June 2008, a National Integrated Tissue Viability Programme was introduced, sponsored by the Scottish Government. The two earlierstatements were reviewed and subsequently combined, incorporating new secondary literature and policy. Specific reference was also made to paediatric concerns. The revised Best Practice Statement (2009) guided the development of a national web-based tool kit to help staff in both acute and primary care settings to put key principles into practice. National tools, some of which have been adapted locally, include:

- Waterlow Risk Assessment — used in acute areas and primary care
- Glamorgan Paediatric Risk Assessment
- Braden Risk Assessment Tool — used in some care homes
- Preliminary Pressure Ulcer Risk Assessment (PPURA) — not widely used but useful in short-stay facilities and used as 'trigger' for members of the public who are carers in the community, to access/obtain professional intervention.
- SSKIN care bundle (a tool that records and prescribes the following aspects of care: Skin inspection, Surface, Keep moving, Incontinence, Nutrition)
- NHS Scotland Pressure Ulcer Safety Cross
- Scottish Adapted EPUAP Grading Tool
- Skin Excoriation Tool — to help differentiate between moisture lesions and PUs
- Patient information leaflet on pressure ulcer prevention
- Wound assessment chart
- Paediatric wound assessment chart
- Scottish Wound Assessment Action Guide (SWAAG).

There are 14 Health Boards within Scotland, 10 of which have tissue viability representation. Within these 10 boards, risk assessment is embedded within nursing practice for primary and secondary care. During the last two years a SSKIN care bundle has been implemented in the majority of acute settings to help focus staff on key elements of pressure ulcer prevention, as presented in the 2009 BPS. This has encouraged early detection of skin vulnerability and/or need for reassessment of individual patient needs.

Outcome measures are monitored locally using the Pressure Ulcer Safety Cross (http://www.healthcareimprovementscotland.org/our_work/patient_safety/tissue_viability_resources/nhsscotland_safety_cross.aspx). Staff are encouraged to reflect on incidents reported, eg red days when a new pressure ulcer found, and this is carried out in varying forms across the country. These include rapid alert investigation, specially devised investigation tools linked to SSKIN and root cause analysis. A subsequent action plan helps staff to learn from any mistakes and improve practice.

Data collection of PU incidence is still somewhat segmented, and not yet collated nationally, preventing accurate evaluation of practice. This is a pivotal piece of work which at present is being carried out involving key stakeholders in NHS Scotland. Formal measurement of incidence will help progress Scotland's vision towards zero tolerance and harm free care over the next two years. There is also awareness that consensus on a national definition for 'avoidable' and 'unavoidable' skin damage due to pressure, is essential for measurement of PU incidence and monitoring of effectiveness of any new initiatives.

The BPS is due for review in 2014. To provide a consistent approach to guidance, links will be made with the Chief Nurse Office, Scottish Patient Safety and Leading Better Care directives. The national association are keen not only to revise the BPS, but also the grading and skin excoriation tools to include clearer definitions and more accurate descriptions for both moisture lesions and deep tissue injury, in line with national and international expert opinion.

Implementation of the BPS toolkit and educational package, developed by the National Integrated Tissue Viability Programme, has raised awareness with healthcare staff, patients and carers, while striving to reduce pressure damage, improve and standardise the quality of care in all clinical settings and care facilities across Scotland.

The practice development toolkit can be found at: http://www.healthcareimprovementscotland.org/our_work/patient_safety/tissue_viability.aspx

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Device-related pressure ulcers Made Easy. Available from: www.wounds-uk.com/made.easy/device-related-pressure-ulcers-made-easy

How to: Pressure ulcer management. Available from: www.wounds-uk.com/how-to-guides/how-to-guide-pressure-ulcer-management

How to: Select a support surface. Available from: www.wounds-uk.com/how-to-guides/how-to-guide-selecting-a-support surface

Pressure ulcer prevention e-module. Available at: www.e-academy.wounds-uk.com

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