Healthcare professionals need to be able to benchmark the care they deliver against standards that ensure the patient receives the best possible care. Care guidelines are compiled using research findings, systematic reviews, case reports and a consensus of expert opinion. It is vital that these guidelines reflect the current evidence available and are reviewed and updated regularly.

Pressure ulcers cause pain and suffering to patients and cost the NHS millions of pounds to treat. Approximately 412 000 individuals will develop a new pressure ulcer annually in the UK (Bennett et al, 2004). The cost of treating a pressure ulcer ranges from £1 064 to £10 551, depending upon its severity. The total cost to the UK is £1.4–£2.1 billion annually, which is 4% of the total NHS expenditure (Bennett et al, 2004).

Pressure ulcers cause a great deal of pain and misery to patients, and their treatment and rehabilitation is a challenge for the members of the multidisciplinary team. Pressure ulcers are areas of localised damage to the skin and underlying tissue caused by unrelieved pressure, friction or shear (Cullum, 2001). Pressure ulcers are graded according to the severity and depth of the skin or tissue damage incurred (European Pressure Ulcer Advisory Panel [EPUAP], 2001) (Figure 2).

In more recent years, patients and carers have become increasingly aware that pressure ulceration is, in the vast majority of cases, preventable. This awareness has led to increased complaints regarding patient care and, in some cases, litigation (Knowlton, 2003). The prevention of pressure ulceration is a multidisciplinary responsibility, and not solely that of nursing staff. This review article examines the most recent clinical guidelines produced to help health professionals, working in both primary (community) and secondary (hospital) care, to prevent and manage pressure damage.

Clinical need for guidelines
Research indicates that pressure ulcers can cause prolonged periods of illness and reduce both the patient’s and carer/relative’s quality of life (Franks et al, 2002). Health professionals working in both primary and secondary care have been challenged to provide holistic, person-centred care for patients, including the assessment and treatment of pressure ulceration (National Institute for Health and Clinical Excellence [NICE], 2005).
ability to assess patients correctly for risk of pressure ulceration requires training and knowledge in order to plan and deliver care. Guidelines enable the health professional to focus attention on the patient with regard to a particular risk or need.

The Clinical Resource Efficiency Support Team (CREST, 1998) guidelines were produced by a collaboration of health professionals in Northern Ireland, and the NICE (2005) guidelines have been produced for England and Wales. The NHS Quality Improvement Scotland (NHS QIS, 2005a;b) best practice statements are intended to support decision-making for health professionals who have direct contact with, and take decisions on, the treatment of patients to prevent pressure ulceration and manage existing pressure ulcers. Local guidelines or policies are produced from national guidelines, and in this way health professionals know that pressure ulcer prevention practice is similar across the UK.

Patient information and education

In order for patients to receive the best care possible, it is important that they are included in any decision-making regarding their care. The formation of a concordant relationship, i.e. one that is based on mutual respect and trust, is vital to maintain patients’ well-being (McQueen, 2000).

NICE (2005) is clear in its recommendations that health professionals should outline the risks of pressure ulceration and the measures that are being taken to prevent such damage. This will ensure that patients can participate fully in their own care. In addition, health professionals should respect the knowledge of patients and their carers regarding a current or previous pressure ulcer and use that knowledge within care planning.

For patients to receive the best care possible, it is important that they are included in any decision-making regarding their care.

NHS QIS (2005a) states that the information contained within its best practice statements aims ‘to provide staff, patients and carers with a framework which can be utilised’. However, it could be argued that patients, relatives and carers may be confused by the terminology used within the statements, as the text is aimed at the healthcare professional and not the lay person. NHS QIS (2005a) also tells practitioners that ‘where appropriate patients and carers [should be] provided with information/education about the prevention of pressure ulcers’, e.g. ‘Relieving the pressure’ a booklet from the Department of Health (1994).

NICE (2005) guidance includes a section on ‘Information for the public’ that contains key information specifically for patients/carers regarding the prevention and management of pressure ulceration. However, every individual patient requires a tailor-made explanation given verbally by carers regarding his or her specific care. Any information or education, verbal or written, given to patients and their carers should be documented so that there is written evidence that such information has been supplied, and by whom (NHS QIS, 2005a; NICE, 2005). CREST (1998) guidance does not explicitly state that health professionals should involve patients and carers in care planning, and does not contain information for the public; however, these guidelines were produced several years ago and the recommendations reflect the current thinking at that time. This illustrates the need for guidelines to reflect current evidence and the need to update guidelines regularly.

Education for health professionals

Health professionals need to acquire knowledge via formal and informal education in order to manage a patient with a pressure ulcer competently (Hiser et al, 2006). Without such knowledge the patient’s treatment may not succeed. It is every health professional’s individual responsibility to ensure that they have the necessary knowledge to fulfil their role (Nursing and Midwifery Council, 2004). NHS QIS (2005a) states that all appropriate staff should receive education and keep updated. This is endorsed by CREST (1998) and NICE (2005), who further state that employers should be committed to the education and training of health professionals, regardless of profession.

Intrinsic factors contributing to pressure ulceration

Both CREST (1998) and NICE (2005) identify the characteristics which cause the patient to become vulnerable to pressure damage. Several of these characteristics are commonly
Review

Grade 1 pressure ulcer:
Non-blanchable erythema

Definition of grade 1: non-blanchable erythema of intact skin. Discolouration of the skin, warmth, oedema, induration or hardness may also be used as indicators, particularly on individuals with darker skin.

Grade 2 pressure ulcer:
Blister

Definition of grade 2: partial-thickness skin loss involving epidermis, dermis, or both. The ulcer is superficial and presents clinically as an abrasion or blister.

Grade 3 pressure ulcer:
Superficial ulcer

Definition of grade 3: Full-thickness skin loss involving damage necrosis of subcutaneous tissue that may extend down to, but not through, underlying fascia.

Grade 4 pressure ulcer:
Deep ulcer

Definition of grade 4: Extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures with or without full-thickness skin loss.
found in individual patients with pressure ulcers (Table 1). It was the identification of these characteristics that led health professionals to develop the risk assessment tools that are used today, such as Waterlow (1985) or Norton et al (1975). NHS QIS (2005a) does not specifically identify these intrinsic factors, but states that the factors that could increase the likelihood of pressure ulceration should be addressed, and gives examples such as nutritional status, blood supply and any chronic diseases such as diabetes. This reflects the nature of best practice statements, which outline agreed standards for health professionals reached by a systematic process, by examining and critically analysing current research, taking into account significant case reports and using opinions from a group of acknowledged experts in order to offer guidance.

### Table 1

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Health status</td>
<td>Acute, chronic and terminal illness</td>
</tr>
<tr>
<td>Mobility status</td>
<td>Reduced ability to relieve pressure independently. Spinal-cord injuries.</td>
</tr>
<tr>
<td>Posture</td>
<td>Pelvic obliquity and posterior pelvic tilt leading to unusual emphasis of pressure</td>
</tr>
<tr>
<td>Sensory impairment</td>
<td>Reduced awareness of pressure leading to reduced spontaneous movement</td>
</tr>
<tr>
<td>Level of consciousness</td>
<td>Reduced spontaneous movement</td>
</tr>
<tr>
<td>Nutritional status</td>
<td>Malnutrition leading to either obesity or debilitation</td>
</tr>
<tr>
<td>Previous pressure damage</td>
<td>Scar tissue is avascular and therefore more prone to breakdown</td>
</tr>
<tr>
<td>Pain status</td>
<td>Individuals in severe pain reduce movement in order to cope with pain</td>
</tr>
<tr>
<td>Psychological and social factors</td>
<td>Acute depression leads to apathy and reduced movement</td>
</tr>
<tr>
<td>Continence status</td>
<td>Moisture leads to friction and skin maceration</td>
</tr>
<tr>
<td>Cognitive status</td>
<td>Inability to recognise risk</td>
</tr>
<tr>
<td>Blood flow</td>
<td>Poor vascular supply means that added pressure will lead to ulceration</td>
</tr>
<tr>
<td>Extremes of age</td>
<td>Neonates and very elderly people</td>
</tr>
</tbody>
</table>

Source: CREST (1998); NICE (2005)

**Risk assessment**

Over the past 30 years many risk assessment tools have been produced with the explicit aim of identifying those patients at risk from pressure damage (NICE, 2005) (Table 2). Some risk assessment tools are better than others at identifying and predicting which patients are likely to go on to develop pressure damage (Deeks, 1996). The tool that is used in an area may depend upon the needs of the particular patient group, for instance, a care of the elderly setting may use Norton (1975) as this tool was specifically designed for older people.

Cullum (2001) identified the importance of the risk assessment tool as being relevant to the patient/care setting, otherwise it may fail to identify the risk, a factor also emphasised by CREST (1998), NHS QIS (2005a) and NICE (2005). This highlights the fact that risk assessment tools should be used in addition to clinical judgement, not as a replacement (Cullum, 2001). If the health professional places complete faith in a tool rather than using his or her clinical judgement, this may endanger the patient. For example, a patient may be able to reposition themselves independently, however, that does not mean that they will do so without prompting. This should be identified, documented and appropriate action taken to ensure that a regular change of position occurs. Consequently, best practice dictates that a pressure ulcer risk assessment tool is used and that the health professional also considers the individual patient, and his or her particular situation and needs.

NHS QIS (2005b) and NICE (2005) agree that pressure ulcer risk assessment should be performed within six hours of admission to hospital. In the community it needs to take place at the district nurse’s first assessment visit. CREST (1998) states that risk assessment

### Table 2

<table>
<thead>
<tr>
<th>Examples of pressure ulcer risk assessment tools</th>
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<tbody>
<tr>
<td>Braden and Bergstrom (1994): developed for use in nursing homes</td>
</tr>
<tr>
<td>Gosnell (1973): used in elderly long-term care</td>
</tr>
<tr>
<td>Norton et al (1975): developed as a research tool for studies in elderly care settings</td>
</tr>
<tr>
<td>Waterlow (1985): general use</td>
</tr>
<tr>
<td>Pressure Sore Prediction Score (Ludwian 1989): developed for use in orthopaedic care</td>
</tr>
</tbody>
</table>
should be performed within two hours of admission to hospital. It is questionable whether this is realistic in an acute care setting where there are likely to be many (potentially life-saving) health interventions that the patient urgently requires. CREST (1998) does not state any recommendation for the community care setting.

Skin assessment and care

Regular skin assessment, especially on repositioning the patient or after an episode of incontinence, can lead to the early identification of increased risk of pressure ulceration and early intervention to prevent damage (Gray et al, 1999). The importance of visual skin inspection is noted by NHS QIS (2005b) and NICE (2005). NHS QIS (2005b) pays particular attention to the examination of bony prominences, such as the heels and sacrum, for erythema. NICE (2005) states that the health professional should examine closely patients with darker skin, as the presence of non-blanching erythema, which appears as a darker area of skin perhaps with a bruised appearance, may otherwise be missed. This is not noted in either CREST (1998) or NHS QIS (2005a).

NHS QIS (2005b) specifically addresses skin cleansing following episodes of incontinence, and reminds the health professional that incontinence can increase the patient’s risk of pressure ulceration as a result of chemical irritation of urine and/or faeces on the skin, and/or inappropriate cleansing regimens. Patients who are incontinent should be cleansed with water but not soap which is an astringent and increases the potential for pressure damage to already vulnerable skin (Cooper and Gray, 2001). Any problems that the patient has with continence, together with the skin regimen, should be documented as part of a plan of care and prompt referral to a continence adviser may be appropriate (NHS QIS, 2005b).

Barrier creams have no place in the skin care of the patient with either superficial or deeper pressure damage (NHS QIS, 2005b). Barrier creams protect the skin against harmful moisture, such as urine and faeces, so should not be applied to open skin.

Pain in pressure ulceration

It is a common misconception that deep pressure ulceration is not painful, as many patients with a superficial pressure ulcer, such as a blister or deep cavity pressure ulcer, which has extended through the skin and deeper tissues, do experience pain (Fox, 2002). It is possible that immobility, secondary to pain, could be a contributory factor towards pressure ulcer development. NHS QIS (2005b) suggests that an assessment of a patient’s pain should be made and appropriate interventions undertaken. NICE (2005) is more explicit, highlighting that the cause and location of the pain should be identified, the level of pain should be assessed using an appropriate tool such as the Numerical Rating Scale (Downie et al, 1978) and, following this, appropriate interventions should be given such as analgesia, repositioning and employing a distraction such as books, magazines or television.

It is insufficient to assess a patient’s pain levels alone; the cause of the pain (if it is not immediately apparent) and the effect of any interventions, such as analgesia, must also be investigated (Taylor, 2000). Patient comfort or discomfort should also be considered when selecting pressure-relieving equipment (NICE, 2005) as, if a patient finds the equipment uncomfortable, he or she may not use it and pressure ulceration may result or existing damage may become worse.

Nutrition

CREST (1998) identifies that a poor nutritional status is an identified intrinsic factor for pressure ulcer development. It does not, however, state any intervention other than referral to a dietician. This reflects the age of the guideline as it is now accepted as common practice for nurses to assess a patient’s nutritional status and to plan interventions before referral to a dietician (Todorovic et al, 2003). NHS QIS (2005b) states that adequate dietary intake (sufficient fluid, calories, vitamins and minerals to supply an individual’s dietary needs) should be ensured.
Basic examples of pressure-relieving equipment

Static equipment; does not move under the patient

Static ‘memory’ foam mattress; moulds around the patient, spreading the load of their weight, so there is less pressure on bony prominent areas, e.g. the patient’s heels

Dynamic equipment; driven by electric pump and does move under the patient

Alternating cell pressure-relieving mattress (APM); comprise of air sacs which alternatively inflate and deflate under the patient

Static cushions; may be foam or gel or a combination of the two

Static cushions; may be foam or gel or a combination of the two

Pressure-relieving boots, specifically for the heels

Alternate cell cushion; to be used together with an alternating cell mattress
for individuals with evidence of pressure damage, and that constant reassessment of an individual’s nutritional status is important. However, nutritional assessment (the formal recording of weight, food intake, recent weight loss, difficulties in chewing/swallowing, etc) is not mentioned explicitly by the NHS QIS (2005a).

NICE (2005) recognises that patients with an identified nutritional deficiency caused by poor diet or acute illness require nutritional support, and that the support should be based upon nutritional assessment, general health status, patient preference and expertise from a dietician. Nutritional support may include supplementary protein or energy drinks, a specially compiled high protein diet, extra feeding via nasogastric tube, or even total parenteral nutrition (TNP) — an intravenous feed.

There is a clear link between an individual having poor nutritional status and the development of a pressure ulcer. Consequently, nutritional assessment using a recognised tool, e.g. the Malnutrition Universal Screening Tool (MUST) (Todorovic et al, 2003), is vital to help prevent pressure ulceration. However, other effective interventions include weighing patients each week, recording food intake to discover which food or drinks a patient prefers, or assessing whether the patient is able to chew or swallow, and providing high protein/energy diets and drinks (EPUAP, 2003).

Repositioning the patient
CREST (1998) suggests that a written repositioning schedule should be used, outlining the times at which an individual has been repositioned and into which position. It also says that ill patients must only sit out of bed for short periods, e.g. during mealtimes. CREST (1998) identifies that bed rest improves sleeping and reduces exhaustion. This simple statement reminds health professionals that patients are ill, and therefore require rest; sitting out in a chair for eight hours does not constitute rest (Gebhardt and Bliss, 1994). Healthcare professionals should also remember that if a patient requires a dynamic alternating cell mattress while in bed, then they will also require a dynamic cushion while sitting in a chair.

There is a clear link between an individual having poor nutritional status and the development of a pressure ulcer.

NHS QIS (2005a) reminds health professionals that patients should be suitably positioned to minimise pressure, friction and shear forces. Positioning will be different for each individual and depends on assessment by physiotherapists and nursing staff. This can be done by using the 30 degree tilt, whereby the patient is not placed in a full lateral (side) position, but placed upon pillows positioned 30 degrees from the surface of the bed (Figure 2) (Preston, 1988), and other positions, e.g. lateral or prone position, appropriate for the individual patient. Slings, slide sheets or other manual handling equipment should not be left under the patient as they may cause areas of pressure against the skin, or cause the patient to slide in the chair or bed. It is important to document changes in position (CREST, 1998; NHS QIS, 2005a; NICE, 2005) as this provides communication between colleagues, patient and carers, in addition to being evidence of the care given.

Patients at risk from pressure damage should not sit for more than two hours before being repositioned (Defloor and Grypdonck, 1999). Whereas NHS QIS (2005a) is specific regarding best practice in repositioning patients, NICE (2005) is vague as it relies on whether or not any research evidence exists to prove the worth of repositioning. This is a difficult area to study since, in order to prove that repositioning patients is valuable in preventing pressure ulceration, a group of patients would need to be deprived of repositioning and may develop pressure damage as a consequence. Such a study is unlikely to be granted ethical approval, without which no study can proceed. NICE (2005) recommends that mobilising and repositioning should be considered for all individuals at risk of pressure ulceration, or who have already sustained ulceration, the frequency of repositioning being determined by the patient’s individual needs, such as physical deformities, surgical wounds or responding to discomfort.

Provision of pressure-relieving equipment
CREST (1998), NICE (2005) and NHS QIS (2005a) all state that, as a minimum, a patient at risk from pressure ulceration should be nursed on a high-density foam mattress, which will mould around
the patient redistributing pressure, rather than providing a flat surface to lie upon. The type of pressure-relieving equipment, whether mattress, bedframe or cushion, is dependent upon the health professional’s assessment of the patient. NICE (2005) highlights the need to consider the patient’s ability to reposition themselves. This is important as patients may be able to reposition themselves on a static mattress, but some dynamic pressure-relieving equipment may disable them because the mattress moves and makes it difficult for the patient to reposition independently.

CREST (1998) includes a flow chart to aid the health professional in equipment choice which is useful for the novice nurse as it aids decision-making. There are many different types of pressure-relieving equipment available (Figure 2). NICE (2005) describes the risk of pressure ulceration to paediatric patients and gives recommendations and safety reminders regarding appropriate use of paediatric-sized equipment and warns against using adult equipment for children. NHS QIS (2005a) reminds health professionals of the increased vulnerability of wheelchair users, whose needs should be assessed by an occupational therapist with special expertise in seating. There are many factors to consider when selecting equipment, not least, the patient’s opinion and cost-effectiveness (Table 3).

**Pressure ulcer assessment**

Documentation is always vital to ensure that an accurate record of care delivery is maintained, whether working in primary or secondary care (Owen, 2005). This ensures that colleagues are kept informed and that the health professional has fulfilled his or her professional responsibility (NMC, 2004).

The aim of pressure ulcer assessment is to:

- Establish the severity of the pressure ulcer
- Generate a plan of care and treatment
- Evaluate treatment
- Assess for possible complications
- Communicate information about the pressure ulcer to all health professionals involved in the patient’s care (NICE, 2005; NHS QIS, 2005b).

Pressure ulcer assessment must be thorough, accurate, consistent and objective (Gardner et al, 2001). This is not only a legal requirement, but also part of any health professional’s duty of care to a patient. CREST (1998) guidelines give little guidance on the scope of pressure ulcer assessment, apart from grading of the pressure ulcer and describing the type of tissue visible in the pressure ulcer. This reflects the age of the guideline and its need for an update.

NICE (2005) and NHS QIS (2005b) both advocate the use of the European Pressure Ulcer Advisory Panel (EPUAP) classification system (2001) to grade pressure ulcers. Therefore, if a patient is assessed as having a grade 3 pressure ulcer, then in...
Europe any health professional should understand that this means the pressure ulcer has extended through the skin and subcutaneous tissue, and reached, but not gone through, the underlying fascia.

It is important to realise that pressure ulcer grading cannot be used in reverse as the ulcer heals. This is impossible as the healing wound does not exhibit regrowth of subcutaneous tissue, muscle and fascia; the healing cavity wound produces granulation tissue which eventually becomes scar tissue once the ulcer has healed (National Pressure Ulcer Advisory Panel, 1998).

Initial and reassessment of a pressure ulcer is not just the responsibility of nurses, but of the entire multidisciplinary team. Reassessment should be performed at least weekly, depending on the condition of the patient and the ulcer. This constitutes best practice, as continuing assessment and documentation of the patient’s progress is part of the evaluation of care (NHS QIS, 2005b; NICE, 2005).

Wound management of pressure ulceration

Pressure ulcers are complicated wounds brought about by a set of circumstances involving pressure, poor nutrition and often underlying medical problems. The treatment of pressure ulcers involves ensuring that all the contributory causes have been rectified or alleviated, otherwise wound management of the pressure ulcer may not be successful.

Table 4

Factors to include in pressure ulcer assessment

| Cause of the ulcer |
| Site/location of the ulcer |
| Dimensions/size of the ulcer (use photography and/or tracings). The depth of the wound should also be included |
| Grade of the ulcer or stage of healing |
| Exudate amount and type |
| Local signs of infection |
| Pain |
| Wound appearance, e.g. sloughy |
| Surrounding skin |
| Undermining/tracking (sinus/fistula) |
| Odour |

Source: NICE (2005), NHS QIS (2005b)
intentions, may cause harm rather than good as from lack of anatomical knowledge they may, for example, inadvertently cut through a tendon. Larval therapy (the use of sterile maggots) may also be appropriate, but is dependent on the health professional’s expertise and the informed consent of the patient (NHS QIS, 2005b).

With regard to the use of modern dressings, e.g. hydrocolloids, hydrogels, foams and hydrofibres, NICE (2005) states explicitly that the choice of dressing should be based upon assessment of the ulcer and patient, e.g. pressure ulcers with dry necrotic tissue require a moist environment to rehydrate the necrotic tissue and facilitate autolytic debridement (for further information see pp. 178–183). It also highlights the need to follow manufacturers’ instructions and to be alert for the possibility of contact dermatitis when a product has caused a skin sensitivity resulting in redness and blistering. NHS QIS (2005b) explains that modern wound management can facilitate the removal of necrotic tissue and that the products selected should be carefully documented, together with a rationale for their use.

**Conclusion**

Guidelines enable health professionals to identify what is current best practice and to use that knowledge within the care delivered to patients. Prevention of pressure damage depends upon the nurse working with the patient and/or carer and other health professionals using a recognised risk assessment tool, and acting on the information that the tool highlights. Good practice demands that practitioners demonstrate that they have used their knowledge and clinical skills to provide effective care. It also demands that the healthcare professional documents thoroughly all such actions in order to provide evidence of the care given.

**Key Points**

- Most pressure damage is preventable.
- Involvement of the patient in decision-making is vital.
- Patients, carers and health professionals all require education/training in pressure ulcer prevention.
- Risk assessment, care planning and evaluation are key in preventing pressure damage.
- All patients at risk from pressure ulceration require repositioning and pressure-relieving equipment.


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