Effective interventions for pressure ulcer prevention

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The aim of this article is to help readers revise their knowledge of the causes of pressure ulcers and to provide an overview of what is currently considered to be the best advice available in preventing pressure ulcers in the clinical setting. This information should help you to provide more effective interventions to prevent patients from developing pressure ulcers. After reading this article you should:

I Outline the major causes of and factors significant in the development of pressure ulcers.
I Identify the best means for assessing those at risk of developing pressure ulcers.
I State the key strategies that you can use to prevent pressure ulcers from developing.
I Demonstrate an increased understanding of current national guidelines and initiatives regarding pressure ulcer prevention.
I Apply current national guidelines and initiatives to your own practice area.

Pressure ulcers are common. A recent study suggests that prevalence rates in the UK are between 5.1 per cent and 32.1 per cent across a range of care settings (Kaltenhaler et al 2001). Pressure ulcers are a major burden of sickness and lead to reduction in quality of life for patients and their carers, requiring increased contact with the healthcare system (Franks et al 1999). Recent financial estimates of the cost of pressure ulcers to the NHS are £400 million to £1 billion per annum (Moody 1997). Of more concern perhaps is that there appear to be variations in practice across different care settings in the UK (Gould 2001).

Rycroft-Malone and McInnes (2000) suggest that this may be due to unproven methods of assessment and prevention. Therefore, it seems timely that attention has recently been refocused on pressure ulcer prevention with the publication of the National Institute for Clinical Excellence (NICE 2001) clinical guidance on pressure ulcer risk assessment and prevention, and the launch of the Essence of Care benchmarks (DoH 2001), one of which refers to pressure ulcers. These are essential elements of the clinical governance agenda, which strives to ensure that all healthcare professionals focus on the activities involved in delivering quality care to patients that is consistent, responsive and effective (Dowsett 2001).

Tissue viability nurses commonly have responsibility for ensuring that relevant national guidelines and initiatives are incorporated into local policies and activities as well as organising sufficient resources to support this. However, not all care settings have access to tissue viability nurses. Where they do exist, often in large organisations, such as hospital or community trusts, they are frequently developing policy and practice-based standards that are broad enough to be used in a variety of clinical and care settings. Therefore, it is important that clinical staff are aware of how they can interpret national and local initiatives for use with patients in their practice area. This will ensure that they are in a position to share and compare care according to best practice and take ownership for continuously improving.
Pressure ulcers, known also as pressure sores, can be described as 'any area of damage to the skin or underlying tissues caused by direct pressure or shearing forces. The extent of this damage can range from persistent erythema to necrotic ulceration involving muscle, tendon and bone' (Mallett and Dougherty 2000). This definition outlines the extrinsic forces that are involved in pressure ulcer formation. However, pressure ulcers are caused by a combination of extrinsic forces in conjunction with a wide variation of intrinsic factors that influence a person’s tissue tolerance.

**Extrinsic factors**

Pressure is often considered to be the most important factor in pressure ulcer development. When the soft tissue is compressed between a bony prominence (such as the sacrum or heels) and a hard surface, the local microcirculation is disrupted, leading to localised ischaemia. The individual’s normal response to such pressure is to change position so that the pressure is relieved. When pressure is relieved a red area appears over the bony prominence. This is called reactive hyperaemia and is the result of a temporary increase in the blood supply to the area that removes waste products and brings oxygen and nutrients to the tissue. It is a normal body response. However, if unrelieved pressure persists, tissue necrosis will follow. This is the start of a pressure ulcer and in the most susceptible patients is thought to occur rapidly. Tissue necrosis occurs in a cone shape with the widest part located at the bone and the narrowest on the body surface. Thus the visible ulcer fails to reveal the full extent of the underlying tissue damage (Gould 2001) (Figure 1). Currently there is no scientific agreement about the time a given amount of pressure can be exerted before injury occurs. Therefore, two hourly repositioning of patients, which has become ritualistic practice in nursing care, is not based on scientific evidence.

The effect of shearing forces also disrupts the local microcirculation by displacing and distorting blood vessels as the skin layers move relative to one another. An example of this is when the skeleton and deep fascia slide downwards with gravity, while the skin and upper fascia remain in the original position, such as when a patient slides down the bed. Bennett and Lee (1986) found that only half the amount of pressure is needed to produce tissue damage if a relatively high level of shear is present (Figure 2).

**Intrinsic factors**

The human body is continuously subjected to extrinsic factors but does not automatically develop pressure ulcers. The determining factors come from the patient. Immobility or reduced mobility is considered to be the most significant risk factor in pressure ulcer development and, in the absence of additional factors, the primary cause of pressure ulcers. A number of studies have found reduced mobility to be a contributory factor for many patients with pressure ulcers (Rycroft-Malone and McInnes 2000, Versluysen 1986). It can affect the ability to relieve pressure effectively, if at all. It also predisposes to shearing and friction if the patient is confined to a bed or chair. It is important to consider what situations create reduced mobility, such as paralysis, anaesthesia, surgery, pain and sedation.

Sensory impairment and a reduced level of consciousness increase the patient’s risk of developing pressure ulcers.
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pressure ulcers. Gebhardt (2002) suggests that sensory impairment is probably the most common cause of pressure ulceration. A reduced level of consciousness may reduce the patient's awareness of the need to relieve pressure. Likewise, anaesthetised patients have no ability to reposition themselves. Sensory impairment results in reduced sensation and insensitivity to pain and/or discomfort. This results in a lack of stimulus to move to relieve pressure. Certain groups of patients may have sensory neuropathy such as those with diabetes, spinal injuries and degenerative neurological conditions.

Extremes of age are associated with an increasing risk of developing pressure ulcers. Individuals over the age of 65 are at greater risk than the general population of developing pressure ulcers (Bergstrom and Braden 1992, Bergstrom et al 1996). This is likely to be due to an increase in cardiovascular disease and neurological disease, and changes in the resilience and elasticity of the skin (Bergstrom and Braden 1992, Bergstrom et al 1996). As people age, the skin becomes thinner and less elastic because of the reduction in the quantity and quality of collagen in the dermis (Bergstrom and Braden 1992, Bergstrom et al 1996). Murdoch (2002) suggests that neonates and very young children are also at greater risk because their skin is still maturing and their head to body weight is disproportionate. Rycroft-Malone and McInnes (2000) state that the very young are therefore more likely to get pressure ulcers on the head.

Severe chronic or terminal illness places individuals at greater risk because of multi-organ failure, poor perfusion and immobility. Emerging research suggests that acutely ill patients are also vulnerable to developing pressure ulcers due to heart failure, vasomotor failure, vasoconstriction due to shock, low blood pressure and the use of sedatives (Bliss 1990), and temperature change, for example, during and after anaesthesia (Scott 2000). Poor blood supply lowers the local capillary pressure and causes malnutrition in the tissues. It may be caused by disease, such as heart disease, peripheral vascular disease or diabetes, or drugs such as beta blockers or inotropes (Bliss 1990).

While not directly linked with pressure ulcer development, malnutrition may increase the risk of developing pressure ulcers. It increases an individual's risk of organ failure and serious illness. Related to this, low and high body weight may increase vulnerability to pressure damage (Allman et al 1985). Emaciated patients have no fatty 'padding' over bony prominences, and so have less protection against pressure. Obese patients can find it difficult to move, thus precipitating tissue damage. Dehydration, often related to malnutrition, may reduce the elasticity of the skin thus increasing tissue deformation under pressure.

Once again, while not directly related to pressure ulcer development, incontinence can increase an individual's risk of developing pressure ulcers. Urinary and faecal incontinence can contribute to moisture on the skin, which places it at greater risk from maceration (softening by soaking) and shearing forces (Goldstone and Goldstone 1982).

One of the first activities in preventing pressure ulcers is the early identification of susceptible individuals. Rycroft-Malone and McInnes (2000) state that traditionally, risk assessment has been carried out by a trained nurse. However, they recommend that if training has been undertaken, risk assessment can also be carried out by medical staff, therapists and healthcare assistants. According to the NICE (2001) guidance and Essence of Care benchmark (DoH 2001), all patients admitted to a care setting should be assessed for risk of developing pressure ulcers, using formal and informal methods, by a professional who is educated in pressure ulcer assessment and prevention. This should take place within six hours of admission and should be documented in the patient's case notes. If the patient is considered not to be at risk, a reassessment should occur whenever there is a change in the patient's condition. Cooper and Gray (2002) add that reassessment should be carried out in response to changes in the individual's physical or mental condition.

Assessment

Review the article so far in relation to your particular patient group. Reflect on those factors that you consider are most significant for your care setting. This will help you when you undertake Time Out 3.

Figure 2. Superficial ulcer
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Berlowitz D, Wilking S (1990) The

Bergstrom N

Bergstrom N, Braden B (1992) A

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Allman R

REFERENCES

McInnes 2000)

Box 1. Signs and symptoms

McGough (1999) states that there is no evidence

importance of possible risk factors (EHCB 1995).

ad hoc

fashion, based on opinions of the relative

As with risk assessment, this has historically been

devices (including seating cushions) and the use of

Recommendations for prevention of pressure sores

recommend that other essential aspects of care

as possible (Rycroft-Malone and McInnes 2000).

individualised plan of care is implemented as soon

developing pressure ulcers, it is important that an

using a mirror to inspect their skin if appropriate.

guidance recommends that patients should be taught

on the signs and symptoms in Box 1. The NICE (2001)

point to indicate the risk threshold, that is, the score

or that any one scale is appropriate for use in all

to support the use of one scale as opposed to another

to use a mirror to inspect their skin if appropriate.

team and the tissue viability nurse how you

discuss with colleagues in the multidisciplinary

care setting. Do you think that it

documentation available in your

Carry out a risk assessment for

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advocate the use of the 30˚ tilt whereby patients are tilted to 30˚ and supported in that position by pillows. Some pressure ulcer prevention strategies for individual needs rather than a ritualistic schedule. It is common knowledge that patients at risk of pressure ulcer development should be reposited. Repositioning of the patient should continue while sitting in chairs for long periods has been recommended that if patients are willing and able to do so. Static low air-loss mattresses in orthopaedic settings (Gray and Campbell 1994, Hofman 1996). According to Rycroft-Malone and McInnes (2000), it is recommended that if patients are willing and able to do so, they should be placed on a pressure-redistributing device on an air mattress. Low air-loss beds in critical care settings (Takala et al 1993). Alternating pressure air mattresses in older, medical, orthopaedic and critical care settings (Gray and Campbell 1994, Hofman 1996). Static low air-loss mattresses in orthopaedic settings (Gray and Campbell 1994, Hofman 1996). Alternating pressure air mattresses in older, medical, orthopaedic and critical care settings (Takala et al 1993). Alternating pressure air mattresses in older, medical, orthopaedic and critical care settings (Gray and Campbell 1994, Hofman 1996). Static low air-loss mattresses in orthopaedic settings (Gray and Campbell 1994, Hofman 1996).
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Figure 3. Correct seating position

The patient should be able to sit well back in the chair with lower armrests. Their arms should be adequately supported by the armrests of the chair. The patient's arms should be wide enough to prevent pressure on the upper arms. Hips and knees should be at 90 degrees. Feet should be flat on the floor. The patient's feet should be under their buttocks, with legs across the knees. The patient's head and neck should be supported, perhaps by the armrests of the chair. The patient's back should be supported by the back of the chair. The patient's shoulders should be relaxed and supported. The patient's elbows should be well forward of the elbows, and the patient's arms should be at a 90˚ angle at the knees, and should be wide enough to prevent pressure on the upper arms. The patient should be able to sit correctly and how to support their feet (Rycroft-Scott 2000).

Accompany an occupational therapist or a physiotherapist on a wheelchair assessment to observe the practical aspects of wheelchair use. A wheelchair user who spends so much time in their wheelchair needs to have a wheelchair that is as comfortable as possible. Their wheelchair needs to be correctly fitted and repositioned frequently. This skill should be a standard service of all health care providers, not just those who care for wheelchair users. If they are wheelchair users who spend so much time in their wheelchair, seating positions. This is particularly important for wheelchair users who spend so much time in their wheelchair. Seating positions. This is particularly important for wheelchair users who spend so much time in their wheelchair.

Seating assessments for aids and equipment should be carried out by trained assessors, such as physiotherapists. This will ensure that the person sitting in the chair is likely to be more significant than redistribution purposes. Gebhardt (2002) suggests that there are various strategies you can adopt to change this practice. Now that you have completed the NICE (2001) guidance, the prevention and management of pressure sores: towards a prevention policy. According to the NICE (2001) guidance, accurate documentation is required. The patient's medical record should include a list of any treatments, therapies and procedures the patient has undergone. The patient's medical record should also include a list of all medications the patient is taking, including any over-the-counter medications and herbal remedies.

The patient's medical record should also include a list of any past medical problems the patient has had in the past year. The patient's medical record should also include a list of any laboratory tests, procedures or imaging studies the patient has undergone in the past year. The patient's medical record should also include a list of any medications the patient is taking, including any over-the-counter medications and herbal remedies.

A detailed assessment using formal and informal methods can be used to assess for a pressure ulcer. This can be carried out by trained assessors, such as physiotherapists. The patient's medical record should also include a list of any medications the patient is taking, including any over-the-counter medications and herbal remedies.

If you are interested in learning more about pressure ulcer prevention, you may wish to consider taking a course in pressure ulcer prevention. There are various courses available online and in-person that can provide you with the knowledge and skills you need to prevent pressure ulcers. These courses can be completed at your own pace and in your own time. These courses can be completed at your own pace and in your own time.

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