Using the 30º tilt to reduce pressure ulcers

Pressure ulcers are not a recent healthcare problem; they have been recorded in the literature for centuries and have probably existed since man has been on earth. Unfortunately, they remain a considerable problem in today’s healthcare settings (Moore and Cowman, 2005).

The challenge for practitioners is that, despite significant investment in education and training and the use of specialised equipment, neither the incidence nor prevalence of pressure ulcers is reducing (Moore and Colman, 2012).

Pressure ulcers commonly occur in those who cannot reposition themselves to relieve pressure on bony prominences (Robertson et al, 1990). The ability to reposition is often reduced in people who are very elderly, malnourished people or who are acutely ill.

The EPUAP (2002) suggested that the majority of pressure ulcers occur during hospital admission in acute care settings. This has significant implications for the health service, as length of stay is protracted for those with pressure ulcers compared with their matched counterparts (Graves et al, 2005). Direct resource costs are also increased and diagnostic-related goals are less likely to be achieved (Bennett et al, 2004).

Recent research exploring the effect of pressure ulcers on health-related quality of life suggests they have a profound impact on the affected individual, with pain being the most significant problem (Gorecki et al, 2009).

Keywords: Pressure ulcer/ Repositioning/Prevention

● This article has been double-blind peer reviewed
Risk factors
Pressure ulcers occur only as a result of exposure to prolonged externally applied mechanical forces (Bader, 1990). Immobility is the prime risk factor that causes someone to be exposed to these forces (Fisher et al, 2004).

The exact mechanisms by which externally applied mechanical forces result in pressure ulcer development are not clearly understood (Stekelenburg et al, 2008; Bader and Oomens, 2006; Bader, 1990).

However, it is suggested that there are four mechanisms within three functional units that lead to pressure ulcer development (Stekelenburg et al, 2008). The mechanisms are local ischaemia, reperfusion injury, impaired interstitial fluid flow and lymphatic drainage, and sustained deformity of cells (Bouten et al, 2003). The functional units are the capillaries, the interstitial spaces and the cells (Nixon et al, 2005).

The role of repositioning
A fundamental way in which nurses can contribute to pressure ulcer prevention is by repositioning those patients who are unable to do so themselves.

Repositioning involves moving patients into a different position to remove or redistribute pressure from a particular part of the body (Krapfl and Gray, 2008). However, as repositioning is often regarded as time consuming and costly (Krapfl and Gray, 2008), there is an increasing reliance on the use of “high-technology” pressure redistribution equipment as a replacement for patient repositioning (Whitemore, 1998). This approach, according to the literature, is not supported, as none of the current high-technology equipment available can completely remove pressure from all bony prominences (McInnes et al, 2008).

While repositioning itself is important, it is necessary to consider the method used. Traditionally, 90° lateral rotation has been used, even though it causes complete anoxia of the weight-bearing areas of the body, so may contribute to the development of pressure ulcers itself (Colin et al, 1996).

The 30° tilt is a repositioning technique that can be achieved by rolling patients 30° to a slightly tilted position with pillow support at the back (Seiler et al, 1986). Some advocate the 30° tilt position because it maintains a level of perfusion over the weight-bearing areas (Defloor, 2000; Colin et al, 1996; Seiler et al, 1986).

International best practice advocates repositioning as an integral component of pressure ulcer prevention strategies. Yet, although repositioning is recommended, there is little scientific evidence about it on which to base clinical decisions (Moore and Cowman, 2009).

This study aimed to help bridge the theory-practice gap by exploring the relative merits of repositioning as a preventive measure in older people assessed as being at risk of pressure ulcers (Moore et al, 2011).

Method
A pragmatic, multicentre, open label, prospective, cluster randomised controlled trial (RCT) was conducted between 2006 and 2009, involving 213 participants in 12 long-term elderly care settings in the Republic of Ireland.

The purpose was to determine the effect of the 30° repositioning technique on the incidence of pressure ulcers compared with usual prevention practices.

A priori sample size was calculated. Following ethical approval and consent, data was collected from people meeting the inclusion criteria for four weeks.

Participants were randomly allocated, by cluster, to the control arm of the study (repositioning using the 90° lateral rotation every six hours or to the experimental arm of the study (repositioning using the 30° tilt, three hourly). Allocation was concealed using remote randomisation. Repositioning was conducted during the night.

The researcher provided education and training for staff before the study started.

The primary outcome of interest was pressure ulcer incidence.

Results
The number of participants enrolled into the study was 213; of these, 114 were in the control group and 99 in the experimental group. Women comprised 79% of the group, with 53% aged 81-90 years, and 70% were at low risk of malnutrition.

There were 87% of participants confined to a chair and 77% had very limited activity. No repositioning care plan was documented at baseline for 77% of participants when in bed; similarly, none was documented at baseline for 74% when sitting out of bed.

During the study, the experimental group were repositioned every three hours at night using the 30° tilt, while the control group was repositioned as per standard practice (six hourly using the 90° lateral rotation). The difference in repositioning frequency between the groups was statistically significant.

Overall, 16 pressure ulcers developed during the study period; seven were classified as grade 1 and nine as grade 2. All pressure ulcers, except one, were located on the sacrum/buttocks. The incidence was 3% in the experimental group (three pressure ulcers) and 11% in the control group (13 pressure ulcers). This difference was statistically significant.

Mobility and activity scores were identified as the strongest predictors of pressure ulcer development.

Discussion
Pressure is the prime cause of pressure ulcers (Bader, 1990); those who are exposed...
to pressure are people who are immobile and cannot relieve pressure from bony prominences (Fisher et al, 2004).

Therefore, the first question to ask is whether the patient can move independently. If problems with mobility and activity are identified, then a risk assessment should be carried out. If there are no problems with activity and mobility, then the patient is unlikely to develop a pressure ulcer.

Having identified the risk of pressure ulcer development due to activity and mobility problems, the objective is to develop a plan of care to ensure patient safety (Moore and Cowman, 2008). This itself is a challenge because, while there are many recommendations in the literature, these are often conflicting and in the main do not guide practice clearly (Moore and Cowman, 2009).

The role of repositioning has been discussed in literature for centuries, with the first recording being that of Robert Graves in 1848 (Sebastian, 2000). However, only two studies have explored its role in prevention within clinical settings (Vanderwee et al, 2007; Defloor et al, 2005) and none that have determined its effect in treatment (Moore and Cowman, 2009). As such, there is a lack of clinical trial evidence and this served as the impetus for the current study.

This study has shown that repositioning people at risk of pressure ulcers three hourly using the 30° tilt has a positive effect on pressure ulcer incidence. It is clear from the few other studies that have explored repositioning that it works (Vanderwee et al, 2007; Defloor et al, 2005), although the exact timing of each patient turn has not been agreed on.

Participants in this study were four times more likely to develop a pressure ulcer when nursed using standard care (six-hourly repositioning using 90° lateral rotations). This finding is similar to that of Defloor et al (2005), which is the largest study exploring repositioning within the literature.

The findings from this study support repositioning people at risk of pressure ulcers. It is evident that, even with the use of pressure redistribution devices, patients still develop pressure ulcers. However, when such devices are combined with a repositioning schedule, the incidence of pressure ulcers reduced by 67% in this study. It is therefore reasonable to suggest that repositioning has a valuable contribution to make in developing effective pressure ulcer prevention strategies.

Conclusion
Immobility is the key risk factor for developing pressure ulcers, so interventions to combat this risk need to focus on this.

The 30° tilt and three-hourly repositioning makes a statistically significant difference to pressure ulcer incidence compared with standard care, and is of value to adopt within the clinical setting. NT

This is a summary of a study first published in the Journal of Clinical Nursing (Moore et al, 2011). The study was funded by a clinical nursing and midwifery research fellowship from the Health Research Board of Ireland.

References