

# Repose: the cost-effective solution for prompt discharge of patients

Sylvie Hampton, Independent Tissue Viability Consultant Nurse, Eastbourne

Within the Eastbourne District General Hospital the discharge of patients with established pressure ulcers, or those who are at risk of pressure ulcer development, can often be delayed because appropriate pressure reducing mattresses are not available for use in the community. This can result in patients who are at risk of developing pressure ulcers experiencing delayed discharge for several weeks; in some cases discharge can be delayed for 3 months.

Extended hospital stay causes not only increased distress for the patient and his/her family but also substantial financial costs to hospitals, it also leads to delays in patient admissions for elective surgery. Therefore, the author was determined to find a solution to the problem.

## PRESSURE ULCER FORMATION

Pressure ulcer formation can be seen as a result of poor nursing practice (Royal College of Nursing (RCN), 1994). Hibbs (1987) found that pressure ulcers were preventable in 95% of cases. The inescapable consequence of unrelieved pressure is tissue destruction, particularly where a bony prominence is in contact with a firm surface over a prolonged period of time. The tissue becomes 'pinched' between the bone and the surface and the capillaries are occluded causing ischaemia and, finally, death of the surrounding tissues.

Prevention, however, is simple: relieving the pressure will restore the blood supply to the capillaries, ischaemia will not occur and pressure ulcer formation is then prevented.

## REDUCING PRESSURE

There may be confusion with regard to the terms 'pressure reduction' and 'pressure relief'.

### Pressure reduction

Pressure reduction reduces pressure load by redistributing pressure. An analogy would be pressure from a shoe causing pain on the bony prominence of the heel and resulting in tissue damage. If that same shoe has a piece

## Abstract

*Pressure ulcer prevention is expensive and at times difficult to achieve. Formation, or the potential formation, of pressure ulcers can lead to delayed patient discharge, particularly when the appropriate equipment is unavailable on the day of discharge. This article reviews the potential of Repose, an inflatable mattress overlay, to be an inexpensive and clinically effective alternative to alternating air mattress systems.*

of foam placed over the area of pressure within the shoe, the reduction in pain and discomfort is almost immediate because the foam has redistributed pressure to a larger surface area.

Pressure redistribution in mattresses can be achieved by the same method. The mattress redistributes pressure over a larger surface area instead of on the bony prominence. Although constant, the pressure is of a low value and the tissue remains viable.

Sylvie Hampton is Independent Tissue Viability Consultant Nurse, Eastbourne



Figure 1. The Repose Mattress overlay

Although dynamic air mattresses are considered the panacea of pressure ulcer treatment and prevention, the associated cost is limiting and providing equipment in adequate quantities can be difficult ... the use of high-technology, high-unit cost systems, that require maintenance, is bound to impact on the growing burden of pressure ulcer management to the NHS. This cost will obviously increase when patient discharge is delayed.

**Pressure relief**

Pressure relief is achieved by two methods: regular repositioning of the patient or the use of a dynamic air mattress, which automatically relieves pressure over short periods of time. Both of these methods will offer temporary pressure relief and allow full recovery of the tissues through reactive hyperaemia.

Patient repositioning is an excellent method of relieving pressure. The 30-degree tilt is widely used to relieve the pressure off patients' bony prominences (Preston, 1988; Gebhardt, 2000).

Achieving regular repositioning for pressure ulcer prevention is complex. Time constraints and low staffing levels may lead to repositioning times being extended or missed. Also, patients may not wish to be regularly repositioned because of pain, feeling unwell or disturbed sleep patterns. Pressure-relieving or pressure-reducing equipment, in addition to skilled patient assessment, can lead to a reduction in repositioning requirements and pressure ulcer formation and increased patient comfort. Therefore, the use of appropriate equipment is vital in pressure ulcer prevention as this supports the concept of individualized patient care.

Although dynamic air mattresses are considered the panacea of pressure ulcer treatment and prevention, the associated cost is limiting and providing equipment in adequate quantities can be difficult. Raising prevention awareness through education and expectations of obtaining the required equipment will lead to increased demand (Hampton, 1999). Price et al (1999) noted that the use of high-technology, high-unit cost systems, that require maintenance, is bound to impact on the growing burden of pressure ulcer management to the NHS. This cost will obviously increase when

patient discharge is delayed.

To improve the discharge time for those at risk of pressure ulcer development there is a need for a clinically effective system that offers a cost-effective alternative to expensive dynamic air mattresses.

**THE REPOSE RANGE**

The Repose mattress overlay was designed in partnership with the NHS, academics and industry. The concept of Repose was developed by occupational therapists at the University Hospital of Wales and worldwide patient protection was obtained. Frontier Therapeutics agreed to manufacture Repose. At the same time, the Wound Healing Research Unit of the University of Wales College of Medicine commenced a formal investigation of the clinical effectiveness of Repose by means of a randomised-controlled trial in comparison with a successful and established dynamic/alternating system.

The Repose overlay (*Figure 1*) is a combination of two high-technology urethane membranes. The inner membrane is inflated and provides static pressure redistribution throughout a tubular cell, which forms along the length of the overlay. The second membrane is formed from a multidirectional stretch, vapour permeable and strong material. The combination of the two membranes provides a unique method of pressure redistribution that is both comfortable and inexpensive, particularly as Repose does not require an electrical supply or costly maintenance (as required for dynamic air systems).

The mattress overlay can be used in hospital, nursing homes and the community and can follow the individual patient on discharge, solving many of the problems of delays associated with lack of equipment. The Repose and its packaging are extremely



Figure 2. Repose is packaged in a cylinder container which also acts as a pump to inflate the mattress.



Figure 3. The Repose Cushion

light and could easily be transported with the patient in either ambulance or private car.

The Repose is packaged in a large cylinder container (Figure 2) which is also a pump designed to inflate the mattress. This pump has large airflow for rapid and easy inflation. The Repose cannot be over-inflated as a valve ensures that correct internal pressures are achieved. Deflation is rapid in emergency situations.

A fundamental element of pressure ulcer prevention is protection of the seated patient. Gebhardt and Bliss (1994) found provision of a cushion to be an important component in pressure ulcer prevention as many patients spend long periods of the day sitting in chairs. Frontier Therapeutics provides a cushion (Figure 3) to ensure that this potential problem is negated. It is recommended that the cushion and mattress should be purchased as a package.

Another concept from the Repose range is the pressure-relieving foot protectors (Figure 4). The foot protectors are effective as supports and in the prevention of heel ulcers (Rees-Mathews et al, 1998). They can be placed under the heels of patients when seated in chairs with feet elevated on stools, or can be used as an additional support when the patient is on bed rest (Figure 5).

## CLINICAL EVIDENCE

Price et al (1999) undertook a prospective, single-centred, randomised-controlled study, involving 80 patients with fractured neck of femur. They compared the skin of these elderly patients, noting the effects of using two different support systems (Repose and a dynamic air mattress) over a 14-day period. At study completion the results showed there were no significant statistical differences between the low-



Figure 3. The Repose pressure-relieving Foot Protectors.



Figure 5. The Repose foot protectors can be used for patients on bed rest.

technology, inexpensive Repose and the more costly, high-technology dynamic air mattress in relation to the skin condition of patients.

The results also demonstrated a 50% lower cost when Repose was the supplied equipment. The conclusion of the study was that the low-pressure overlay appeared to offer a similar level of benefit in preventing the development of pressure ulcers and merited further investigation due to the potential for major cost reduction.

An internal evaluation was also conducted at Eastbourne District General Hospital by the author. This evaluation involved 20 patients deemed 'at risk' of pressure ulcer development whose discharge had the potential to be delayed while suitable mattresses were found for them to use in the community. The aim was to monitor both pressure ulcer development and speed of patient discharge.

Ten patients were randomly (envelope system) allocated a Repose mattress and ten continued as per normal, i.e. if a mattress became available they would be supplied with it, otherwise they would remain on the ward until one became available in the community. The evaluation was set up as a pilot study with each patient followed from admission, through discharge and for 8 weeks post-discharge.

Six out of nine patients for whom data were collected and who were provided with a Repose mattress and cushion were discharged within a few days. The three that remained in hospital were retained for medical reasons. Of those patients not allocated Repose mattress overlays, four out of ten were discharged within a few days while the other six had to wait for high-technology equipment to become available in the community.

Three of these patients died while in hospital. The delay in discharge was, on average, 3 weeks, although two remained for several weeks after the recommended date of discharge.

No adverse effects of earlier discharge for the patients in the Repose group were identified during the 8-week follow up. No patient developed pressure ulcers on the Repose overlay. The patients all reported that the Repose was 'comfortable' or 'very comfortable'.

The evaluation showed that cost savings could be made for the Trust by using Repose. Identifying cost savings for the Trust is complex as each patient has a different cost component to his/her care. A hidden cost saving is the maintenance cost of high-technology mattresses.

## DISCUSSION

The longer patients stay in hospital the higher the risk of developing clinical infection (Nguyen-Van-Tam et al, 1999; Shek et al, 2000). The evaluation at Eastbourne demonstrates that Repose may facilitate quicker patient discharge, thereby reducing this risk. Furthermore, speedier discharge will both reduce the cost associated with keeping the patient in hospital and improve the quality of care offered to patients and their carers.

## CONCLUSION

The Repose overlay and cushion are clinically effective and cost-effective methods of pressure ulcer prevention. They can offer patients not only comfort but also an earlier discharge. **BJN**

## KEY POINTS

- *Patients at risk of pressure damage should not be discharged from hospital unless appropriate equipment is available in the community.*
- *Hospital lengths of stay may be extended as a result of non-availability of appropriate pressure support surfaces within the community.*
- *Pressure ulcer formation may be seen as an inevitability of poor practice.*
- *Extended hospital stays result in substantial costs for the hospital and less appropriate care for patients.*
- *The Repose mattress was designed in partnership with the NHS, academics and industry and was developed by occupational therapists. It is a clinically proven, cost-effective and easily portable product.*
- *A study of Repose and a dynamic air mattress showed that there were no significant statistical differences between the two systems in the prevention of pressure ulcers.*

Gebhardt C (2000) New rituals for old (editorial). *J Tissue Viability* 10(4): 131

Gebhardt C, Bliss M (1994) Preventing pressure sores in orthopaedic patients - is prolonged chair nursing detrimental? *J Tissue Viability* 4(2): 51-4

Hampton S (1999) Efficacy and cost-effectiveness of the Thermo-contour mattress. *Br J Nurs* 8(15): 990-6

Hibbs P (1987) *Pressure Area Care for the City & Hackney Health Authority*. St Bartholomew's Hospital, London

Nguyen-Van-Tam SE, Nguyen-Van-Tam JS, Myint S, Pearson JC (1999) Risk factors for hospital acquired urinary tract infection in a large English teaching hospital: a case-control study. *Infection* 27(3): 192-7

Preston KW (1988) Positioning for comfortable pressure relief: the 30-degree alternative. *Care Sci Pract* 6(4): 116-19

Price P, Bale S, Newcombe R, Harding K (1999) Challenging the pressure sore paradigm. *J Wound Care* 8(4): 187-90

RCN (1994) A case to answer (video). RCN, London

Rees-Matthews S, Cook H, Bale S (1998) The use of low pressure inflatable foot protectors in the management of patients with pressure sore damage to the heel. Proceedings of the European Wound Management Association, November Emap Healthcare, London: 17-19

Shek FW, Stacey BS, Rendell J, Hellier MD, Hanson PY (2000) The rise of *Clostridium difficile*: the effect of length of stay, patient use and antibiotic use. *J Hosp Infection* 45(3): 235-7