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 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.

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.
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 ... 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.

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...
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-
i nflated 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-
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.

**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.**

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


