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Dear Michael

Re: Prevention of Pressure Ulcers: A Case Study

I enclose a copy of the above article recently published in the February edition of the Nursing & Residential Care Journal.

I was very pleased with the way it was presented. It is a very good example of a collaborative approach to an important aspect of patient care.

With kind regards and a successful 2001.

Yours sincerely

Jennie Gough
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Preventing Pressure Ulcers in a Private Hospital Setting - Ensuring Patient Satisfaction and Maintaining Cost Effectiveness in Mattress Purchase

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Summary

Preventing pressure ulcer incidence and ensuring patient comfort are essential components of providing quality clinical care. The purchase of Thermo contour mattresses has proven successful in a number of areas: it has reduced pressure ulcer incidence, eliminated complaints regarding discomfort, and in particular, have proven extremely cost effective. Coupled with the ease of interface with many types of profiling beds, the Thermo contour mattresses have been an enormously successful purchase at the Princess Margaret Hospital. Moreover, with the length of guarantee in mind, it is envisaged that no further mattress purchasing costs will be incurred for at least another 4 years.

Introduction

The Princess Margaret Hospital, part of BMI Healthcare, is an 80 bedded private hospital. Patients admitted to this hospital, a significant number of whom are elderly, have a variety of medical and surgical conditions, and therefore clinical need. For example, many of the patients undergo planned arthroplasty of the knee or hip. The hospital also has a high dependency unit. Provision of pressure-reducing or pressure-relieving equipment is an essential component to the quality of care offered to these patients, many of whom are known to be at risk of pressure ulcer development.

The Problem

The Princess Margaret Hospital provides profiling beds for each of its patients. Originally however, those patients not deemed to be at risk from pressure ulcer development (i.e. with a Waterlow risk score of less than 10) were provided with a standard NHS type mattress, manufactured in three segments, for use with profiling beds.

The NHS type mattresses were old, and had dips where the patient sat, indicating that the foam had compressed. A closed fist pressed into the dip located the metal bed-base, which confirmed that the mattresses were in need of replacement. The lack of stretch in the PVC coated nylon cover had resulted in a hammocking effect, which limited the ability of the body to contact with pressure-reducing properties of the foam (MDA, 1993). Furthermore, patients were frequently complaining of feeling extremely uncomfortable on this particular mattress. Many of the NHS style mattresses had brown staining on the covers, suggesting that they were no longer waterproof, enabling the foam core to become contaminated with bodily fluids Santy (1995).

For those patients who were not at risk of pressure ulcer development, fibre-filled overlays were provided in order to increase their comfort. However, provision of the fibre-filled overlays was of some concern to the nursing staff for a number of reasons. Each time a patient required an overlay, it had to be carried from the store cupboard on the ward to the patient's room by the nursing staff, posing a potential manual handling risk. Furthermore, research has demonstrated that after six months use, some fibre filled mattress overlays may provide worse pressure reduction than a standard NHS mattress (MDA, 1994). This therefore placed the patient at more risk from pressure ulcer development than before. Princess Margaret Hospital was consequently having to regularly replace the fibre-filled overlays in order to

ensure that they posed no risk to the patient, whilst still maintaining comfort. The requirement for regular overlay replacement and the cost of laundering the existing overlays has been demonstrated to be not as cost effective as previously thought (Conine et al, 1990). An alternative solution was therefore required for this group of patients.

Any patient in the Princess Margaret Hospital deemed to be "at risk" from pressure ulcer development is immediately provided with a hired alternating air mattress. The current cost of hiring such a product is £60 per day + VAT, and such mattresses continue to be hired by the hospital as and when necessary. However, it was identified that in many instances, a static pressure-reducing mattress would have been sufficient to meet a patient's needs, had it offered improved pressure reduction and comfort than the standard mattress with fibre-filled overlay. Alternating air mattresses were therefore frequently inappropriately hired, at a considerable cost to the hospital.

Identifying a Solution

Princess Margaret Hospital decided to identify a pressure-reducing mattress, which could be purchased for general use on all of the hospital beds. It also wished to purchase a product, which could be used to prevent pressure ulcers in those patients who were low to medium risk. Any patient deemed to be at a higher risk of pressure ulcer development continued to be provided with an alternating air mattress.

Benbow (1996) suggested that the support surface a patient is placed on should ideally distribute pressure evenly, minimise friction and shear forces, and provide a comfortable, well-ventilated support. It should also be acceptable to the patient, not impede nursing procedures, and be easy to maintain and inexpensive. It is widely accepted that clinicians have great

difficulty in choosing mattress replacements due to the enormous choice available and lack, in most instances, of clear clinical evidence to support a product's efficacy (Young, 1992).

A working party at the hospital was convened in order to address the mattress problem. It selected several pressure-reducing mattresses to evaluate on one of the wards, prior to making a decision regarding purchase. Mattresses were rated according to the following criteria:

1. Patient comfort (the working party accepted that it is difficult to assess comfort objectively (Rimmer, 1992), and therefore relied on patient's subjective feedback for this aspect of the criteria.)
2. Ease of interface with profiling beds
3. Evidence of product efficacy
4. Extensive product guarantee – both on the foam and on the cover

Outcome

The Thermo contour mattress was the mattress identified by the working party, as best fulfilling the required criteria. Thermo contour mattresses are constructed from a lightweight visco-elastic polymer. This type of foam has a slow memory; as the patient lies on the foam, it reacts to the body heat, and moulds itself to the shape of the person, thereby evenly distributing the body weight and reducing interface pressures. Definitive evidence is available to support the efficacy of Thermo contour mattresses (Eastbourne NHS Hospital Clinical Trial, Hampton, 1999) in an acute hospital setting.

It is essential that pressure-reducing mattresses are covered with a stretch fabric, as this can make a significant improvement to the interface pressure measurements, and therefore pressure-reducing properties of a mattress (MDA, 1993). Thermo contour mattresses are covered in a multi-stretch,

vapour-permeable cover, and at the time, the manufacturer recommended that patients with Waterlow scores of up to 23 may be safely nursed on them.(1999 Clinical Trial results proved that patients with Waterlow scores of 25 developed no pressure sores when nursed on the Thermo contour mattress)

The hospital currently uses Hill Rom profiling beds. Thermo contour mattresses are easily used in conjunction with such beds. The ability of the foam to mould to the body shape also contributes to the reduction of shear forces, which is of particular use when nursing a patient in a semi-recumbent position, as the patient has a reduced tendency to slide down the bed. The mattresses lend themselves to any medical or surgical condition, and have therefore proven extremely versatile in this particular setting.

Evaluation of Purchase

Since the purchase of 80 Thermo contour mattresses four years ago, patient complaints regarding discomfort from pressure ulcers have been almost eliminated, and the Princess Margaret Hospital has been delighted with the performance of the mattresses. Indeed, the mattresses continue to work well, and have shown no signs of "bottoming out". The housekeepers have found the mattress extremely easy to clean, with "Starclean", a mild disinfectant. There has been no de-lamination of any of the covers.

The new mattresses have proven to be extremely cost effective – the hospital has greatly reduced its requirement to hire dynamic air mattresses, and no longer has to consider frequent general mattress replacement, nor replacement and laundering of overlays.

The incidence of pressure ulcers has also been reduced, due to the provision of a pressure-reducing mattress for every patient, and the prevalence rate for the hospital is now less than 1%. Moreover, of the eighty mattresses

purchased, only one has required replacement, due to accidental damage of the cover. There have been no signs of de-lamination of the covers, and the foam of the mattresses remains in good condition.

A PRESSURE ULCER may be described as tissue necrosis caused by occlusion of the local blood supply, which occurs at any part of the body where external pressure acts upon a bony prominence (Birchall, 1993). They are associated with lying or sitting in the same position for long periods of time, with inadequate provision of pressure relieving or pressure reducing support surfaces (Hibbs, 1988). A complex range of variables is known to cause pressure ulcers (Bridel, 1993). Intrinsic factors include increased age, reduced mobility, loss of consciousness, poor skin condition and neurological deficit. Extrinsic factors include unrelieved pressure, shear forces and friction.

Pressure ulcers cause enormous distress to the patient and his or her relatives due to pain and suffering, and can take many weeks to heal. Furthermore, pressure ulcers are costly, both in terms of length of hospital stay, and the resources required to heal the wounds. Waterlow (1995) reported the case of a patient who developed a pressure ulcer on the back of his head whilst in ITU, and who subsequently received a settlement of £144,000 following litigation. Collier (1994) estimated the cost of pressure ulcer treatment at £40,000 for one severe pressure ulcer.

Pressure ulcers are largely preventable (Hibbs, 1988), providing that suitable pressure-relieving and pressure-reducing equipment is provided for "at risk" patients (Fletcher, 1996, Collins, 1999), and identifying those patients who are at risk is an essential component to any pressure ulcer prevention policy (Benbow, 1993). Furthermore, the timing of equipment provision is of utmost importance: equipment must be used early enough, or at the most vulnerable stage of an admission, in order to prevent pressure ulcer development (Bliss, 2000). The problem faced by many clinicians attempting to initiate a mattress replacement scheme is which mattresses to purchase for which particular

client group. There is an enormous choice of mattresses currently on the market, very few of which have supporting clinical evidence.

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