

A clinical audit of the Softform Premier Active™ mattress in two acute care of the elderly wards

This article reports on the findings of a study which was carried out to compare the effect of the Softform Premier Active mattress™ (a foam mattress with a dynamic, alternating underlay), versus a standard air mattress on pressure ulcer incidence in two acute, care of the elderly wards over a six-month period. The results revealed a pressure ulcer incidence of 8% in both groups, which was considered to be unexpectedly low in such a vulnerable, high risk population. It was concluded that the Softform Premier Active was as effective as the standard air mattress in pressure ulcer prevention, but had the advantages of dual functionality and lower cost.

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KEY WORDS

High-risk, elderly patients
Softform Premier Active™
mattress
Pressure ulcer prevention
Pressure ulcer incidence

Since the pioneering work of Norton et al (1975) the relationship between pressure ulcer development and the elderly has been recognised. Bliss (2000) identified that the risk of pressure ulcer development increases with the severity of illness in older patients. Given the increasing ability of medicine to sustain life in the most fragile of individuals, and with an ageing population, it is clear that there are growing numbers of frail elderly patients who are at high risk of pressure ulcer development (Waldron, 2006). It is vital that the preventative care provided to these vulnerable individuals is based upon the best available clinical guidance and is regularly audited to confirm its efficacy (Cooper et al, 2006).

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In the early 1990s there was an increased awareness of the role that pressure-reducing support surfaces could play in the prevention of pressure ulcers and of the need to investigate the effectiveness of the products used (Young, 1992).

In 1992 Gray et al conducted the first of what was to become a series of clinical studies that investigated the efficacy of a variety of pressure-reducing support surfaces developed by Invacare, Cardiff.

In the first clinical audit (Gray, 1992), the relationship between risk assessment, the provision of pressure-reducing equipment and its effect on pressure ulcer incidence was explored. The audit focused upon the use of an alternating pressure air mattress and six-pressure reducing foam overlays (Propad Premier Mattress Overlay; Invacare, Cardiff [formerly MMS]) on an orthopaedic trauma ward over a six-month period. The results found that when the foam overlays were used with the air mattress there was a dramatic reduction in the incidence of pressure ulcers.

The Propad Premier Mattress Overlay was later incorporated into a pressure-reducing foam mattress called the Softform Original (Invacare,

Cardiff). Gray and Campbell (1994) subjected the new mattress to a randomised, controlled trial (RCT) in which it was compared to a standard hospital mattress (a slab foam with non-stretching cover) on orthopaedic, trauma, medical, oncology and surgical wards over a one-year period. This study identified a statistically significant lower incidence of pressure ulcers in high-risk patients when they were nursed on the Softform Original mattress compared with the standard foam mattress. These findings demonstrated that the additional cost of the new mattresses could be justified on the basis of the reduced pressure ulcer incidence rate, and resulted in all mattresses throughout the hospital being replaced with Softform Original mattresses.

In 1998, Gray et al conducted a clinical audit of the new mattresses' performance on the same wards as the RCT (Gray and Campbell, 1994), and identified that the original hospital mattresses were no longer in use and that the Softform Original mattresses were still performing as well clinically as they had done in the RCT three years before.

In 2001, Gray et al carried out a six-month clinical audit to investigate the use of the Softform Premier mattress in conjunction with an electric bed

frame in two high dependency units. The results showed a low level of pressure ulcer development in the high-risk patient population.

This article details a study carried out to determine the effect of using the Softform Premier Active™ Mattress versus a standard air mattress on pressure ulcer incidence in two acute care of the elderly wards.

The Softform Premier Active Mattress, which consists of a Softform Premier foam mattress with a dynamic underlay (Figure 2), is designed for use in both acute and community settings. The underlay, which alternates on a 10-minute cycle, can be activated through connection to a portable pump, which is activated by a simple on/off switch (Figure 3). The pump features software which is able to assess a patient's weight, and subsequently supply the appropriate level of air to create an alternating surface for use in patients at very high risk of pressure ulcer development. When the alternating surface is not required, the pump can be disconnected, and the mattress becomes static. The pump can then be stored away or used elsewhere with another

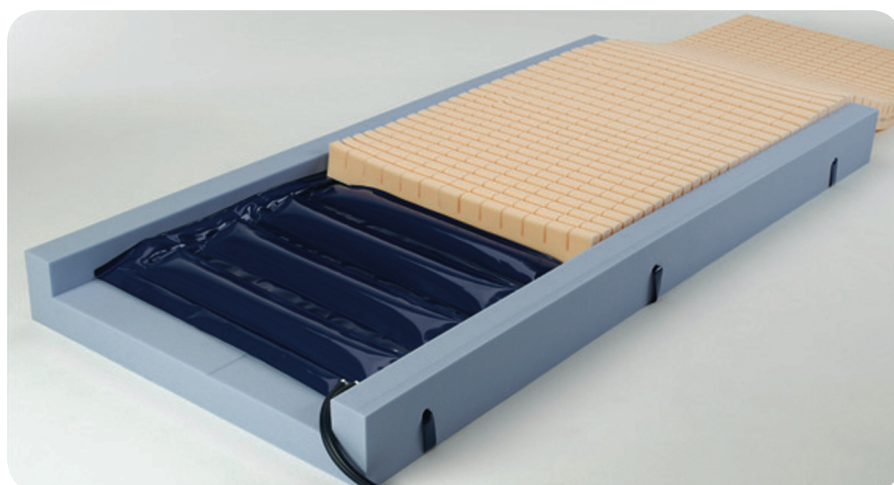


Figure 2. The Softform Premier Active mattress consists of a Softform Premier mattress with a dynamic underlay.

Softform Premier Active mattress. The ability to use the mattress as either a dynamic or static surface means the patient can stay on the mattress throughout the course of their treatment, minimising the need for moving and handling, and in particular the use of a hoist, and allowing their care to be stepped up or down as appropriate.

Acute care of the elderly wards were selected for the evaluation to ensure that the mattresses were used in a population at very high risk of pressure ulcer development. The majority of patients admitted to the wards normally require nursing

upon an alternating-pressure air mattress on admission and in the days afterwards. As their condition stabilises or improves, the patient can then be moved off the alternating system and onto a static foam mattress.

Clinical audit

Before starting the study, a clinical audit of practice was undertaken to establish if the standard of care provided on the two wards was in line with best practice as defined in the best practice statements *Pressure Ulcer Prevention* (Cooper and Gray, 2005) and *Care of the Older Person's Skin* (Cooper et al, 2006) and to identify any deficiencies in care. The previous studies by Gray et al (Gray, 1992; Gray and Campbell, 1994; Gray et al, 1998; 2001) failed to take into account the influence of the nursing care provided, in addition to mattress provision, on the pressure ulcer incidence rates. This could have potentially created biased results, and so the pre-study audit was carried out to address this.

Two major issues were identified as a result of the audit; the amount of time the patient spent sitting out of bed varied across the wards, as did the availability of pressure-reducing cushions for these patients. These issues were rectified via the provision of pressure-reducing seat cushions and all staff being advised that a patient should sit out for two hours, before being returned to bed for a



Figure 1. The Softform Premier Active mattress and pump.



Figure 3. The portable pump with the on/off switch shown.

minimum of one hour. As a result of these interventions both wards had a comparable level of care provision before the start of the study, that was in accordance with best practice.

The study

Aims

The aims of this study were to determine the effect of the Softform Premier Active mattress *versus* a standard alternating pressure air mattress on pressure ulcer incidence on two high-risk acute care of the elderly wards over a six-month period, and to determine the staff's opinion of the mattresses' performance.

Method

Two acute wards from within a large Care of the Elderly Hospital were used for the study. All the admissions into the wards were emergencies

Table 1

Findings of the staff questionnaire (n=25)

	Very good	Good	Adequate	Poor	Very poor
Moving and handling	6	13	6	0	0
Cleaning	12	10	3	0	0
Patient acceptability	7	14	5	0	0
Ease of set up	11	9	5	0	0

with a variety of causes, the most common of which was acute infection.

At the start of the 6-month study period, each ward was provided with five Softform Active mattresses and pressure-reducing cushions (Softform Premier Active Cushions; Invacare, Cardiff) for use by all study participants if required, regardless of mattress allocation.

On admission to the ward, patients were assessed using the Waterlow risk assessment calculator and clinical judgement in accordance with local policy. Patients considered to be at high risk of pressure ulcer development were randomly allocated to a Softform Premier Active or standard air mattress. Preventative care such as repositioning and regular skin inspection was carried out according to best practice (Cooper and Gray, 2005; Cooper et al, 2006) and the individual's plan of care, and findings documented in the patient's notes. Any pressure ulcers that developed during the study period were graded by a member of the tissue viability department.

At the end of the six-month period, the patient's notes were analysed retrospectively to extract information relating to their skin condition. As each ward was also required to complete a weekly pressure ulcer incidence report, these were obtained for the six-month study period and used as a cross reference with the study findings to ensure that no ulcers were missed.

An anonymous questionnaire was issued to each member of staff working on the wards to establish their opinion on the performance of the Softform Active Premier mattress in relation to the existing standard air mattress in terms of ease of moving and handling, cleaning, acceptability to the patient and set-up.

Results

During the study period, 50 subjects used the Softform Premier Active

Key Points

- ▶▶ The Softform Premier Active mattress is a foam mattress with a dynamic alternating underlay.
- ▶▶ When an alternating surface is required, the mattress can be activated through the use of a portable pump. Removal of the pump returns the mattress to a static foam surface, enabling the patient's care to be stepped up or down as appropriate without the need to move them.
- ▶▶ A study of the Softform Premier Active mattress *versus* a standard alternating pressure air mattress was carried out to determine the effects on pressure ulcer incidence over a six-month period in two acute care of the elderly wards.
- ▶▶ Results indicated that the Softform Premier Active mattress was as effective as the standard air mattress at preventing pressure ulceration in the high-risk patient population.
- ▶▶ A post-study questionnaire of staff who used the equipment revealed that they found the Softform Premier Active Mattress to be as good as the standard air mattress in terms of moving and handling, cleaning patient acceptability and ease of set up.

mattress (mean age=82.4 years; mean number of chronic conditions = 3.2; mean Waterlow risk score = 22.2 [range=17–29]) and a further 50 subjects were managed on a standard air mattress (mean age=84.0 years; mean number of chronic conditions =

3.1; mean Waterlow risk score = 21.6 [range=17–29]).

Of the 50 patients using the Softform Premier Active Mattress, four developed superficial, grade 2 (EPUAP, 2001) pressure ulcers (sacral ulcer, n=3; heel ulcer, n=1) while four patients using the air mattresses also developed grade 2 (EPUAP, 2001) ulcers (sacral, n=2; heel, n=2). This resulted in a pressure ulcer incidence of 8% in both groups individually and collectively. The findings of the staff questionnaire are outlined in *Table 1*.

Discussion

Various studies into the Propad Premier Mattress Overlay and Softform Premier Mattresses have been carried out in the department of tissue viability in Grampian over a 16-year period. Only in this most recent study has the impact of nursing care and co-morbidities on pressure ulcer incidence been considered. The retrospective collection of data removed the potential for bias resulting from the presence of a researcher in the clinical area. By conducting a full audit of care before the study and addressing the deficits identified, the provision of preventative care was of a high standard and in accordance with best practice in these wards before the study began.

The results of this study showed that in both patient groups, there was a high rate of co-morbidities recorded, in addition to the reason for admission. This, coupled with the mean ages of the patients resulted in an acutely ill elderly study population at very high risk of pressure ulcer development, as indicated by the mean Waterlow scores. Therefore a pressure ulcer prevalence of 8% in such a vulnerable population was surprisingly low.

Meaume (2005) reported a pressure ulcer incidence of 15.7% in an elderly population (aged 65 years and above) and a study of all hospitals (excluding university hospitals) in France identified an 8.9% prevalence (Barrois et al, 2008). As the study population would have included a

number of younger, healthy subjects in the analysis, it suggests that the pressure ulcer incidence rate would have been much higher in an older population.

An 8% incidence rate in both study groups indicates that the Softform Premier Active mattress was as effective as the standard air mattresses in preventing pressure ulceration.

The staff response to the equipment was very positive and a post-study questionnaire confirmed that they found the new equipment performed as well as the standard air mattresses in terms of moving and handling, ease of cleaning and set up and patient acceptability.

The dual functionality of the Softform Premier Active Mattress was an advantage in the clinical setting since when the patients treated on this mattress no longer needed an alternating surface, the pump was removed converting the mattress to a static foam mattress. The Softform Premier Active mattress also costs less than many available alternating air mattresses, giving trusts the option to reduce the expenditure associated with the purchase or hire of such equipment.

The effectiveness of the mattresses used in this study cannot be viewed in isolation, however, must be considered in the context of the nursing care provided. The pre-evaluation audit pointed towards a high level of preventative care being provided in the wards, and the changes in practice post-audit will have further enhanced this provision. It is clear that this high level of care will have played a significant part in ensuring that the pressure ulcer incidence rates in such a vulnerable, high risk group were so low.

Conclusions

In an elderly and acutely ill population at high risk of pressure ulceration the Softform Premier Active Mattress was found to be as effective in reducing pressure ulcer incidence as the standard alternating pressure

air mattress. It should be recognised that this study was conducted in an environment that provided high levels of nursing care, indicating that where there is effective equipment available and motivated, well-informed staff, pressure ulcer incidence can be kept relatively low even in the most high-risk populations. **WUK**

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