A specially designed foam mattress replacement reduced pressure ulcers in nursing home residents


Objective
To compare a foam mattress overlay with a foam mattress replacement for reducing pressure ulcers in newly admitted nursing home residents.

Design
Randomised controlled trial.

Setting
A 250 bed teaching nursing home in Nebraska, USA.

Patients
492 patients who were newly admitted were screened and 40 patients (mean age 77 y, age range 22–98 y, 55% women) were enrolled. Inclusion criteria were expected stay ≥ 10 days, absence of pressure ulcers, and being at risk of pressure ulcer development defined as a Braden Scale score < 18 with a subscale score of < 3 in sensory perception (limited ability to feel or report pain), mobility (able to make only slight changes in position), or activity levels (chairbound or unable to walk). Follow up was complete.

Intervention
Patients in both groups received standard care. 20 patients were allocated to the Iris 3000 mattress overlay (Bio Clinic of Sunrise Medical Corporation, Ontario, Canada). The overlay is 10 cm of foam designed to be placed over a standard mattress to decrease the pressure between the bony prominences and the bed surface. It has a flat dimpled surface, a 6 month warranty, is for single patient use, and the cost is US$ 38. Twenty patients were allocated to a foam mattress (MAXIFLOAT, BG Industries, Northridge, CA, USA). It has 4 primary sections: a water repellent, antibacterial top cover; a 4 cm thick, 2 kg dual indentation force load deflection, luxury grade, high resiliency, antimicrobial foam inner cover; a centre core 15 kg indentation force load deflection, flame retardant, polyurethane foam with exclusive die cuts and a 41 by 66 cm non-removable polyester fibre heel pillow to provide extra protection; and a waterproof, antibacterial bottom cover attached directly to the top cover. It has a 5 year warranty, is designed for multiple use, and the cost is $260 per bed.

Main outcome measure
The Bergstrom Skin Assessment was used to determine the incidence of pressure ulcers. It was used 3 times per week for 10–21 days.

Main results
12 patients developed 16 ulcers in the overlay group compared with 5 patients who developed 5 ulcers in the mattress group (60% v 25%, p = 0.025) (table). The groups did not differ for the mean number of days to development of pressure ulcers (6.5 d for the overlay group v 9.2 d for the mattress group, p = 0.3).

Conclusion
Newly admitted patients who were at risk of the development of pressure ulcers had a lower incidence of ulcers when they used a specially designed foam mattress compared with a foam overlay and a standard mattress.

Foil mattress v foam overlay for preventing pressure ulcer*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Patients with pressure ulcers</th>
<th>EER</th>
<th>CER</th>
<th>RRR (95% CI)</th>
<th>ARR (EER - CER)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mattress</td>
<td>25%</td>
<td>60%</td>
<td>58%</td>
<td>10 to 82</td>
<td>35%</td>
<td>3</td>
</tr>
<tr>
<td>Overlay</td>
<td>60%</td>
<td>25%</td>
<td>58%</td>
<td>10 to 82</td>
<td>35%</td>
<td>3</td>
</tr>
</tbody>
</table>

*Abbreviations defined in glossary; RRR, ARR, NNT, and CI calculated from data in article.

Source of funding: no external funding although BG Industries loaned the study mattresses to the facility.

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Commentary
Research that assesses therapeutic surfaces must be emphasised as an important tool in expanding nursing knowledge. The work of Vyhlidal et al provides concrete information on the comparison of 2 specific surfaces: a foam overlay and a mattress replacement. Jester and Weaver1 suggest in a report from research by Krouskop and Garber, that technological advances, as reflected in a variety of new pressure relieving devices, can only show benefits if they are used correctly. Their research strongly supports the need for rigorous evaluation of pressure relieving devices. In 1994, Kemp and Krouskop completed a study that showed a reduction in the occurrence of ulcers by managing the therapeutic surface correctly.1 The problem for nurses is the absence of adequate research on which to base clinical decisions.

Two limitations must be considered. Firstly, only 2 surfaces were reviewed. The United States Agency for Health Care Policy and Research Pressure Ulcer Treatment Guideline suggests that a minimum of 6 therapeutic surfaces should be considered.2 This study therefore provides a beginning for future research as additional clinical comparisons will certainly assist nursing decision making. Second, it is not clear that the assessors were blind to the surface used.

The conclusions provide nurses with good clinical data to assist with choosing therapeutic surface interventions.

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1 Jester J, Weaver L. A report of clinical investigation of various tissue support surfaces used for the prevention, early intervention and management of pressure ulcers. Ostomy Wound Manage 1999;26:39–45.
2 Krouskop T, Garber SL. The role of technology in the prevention of pressure sores. Ostomy Wound Manage 1997;16:34.
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