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[Intervention review]

Support surfaces for pressure ulcer prevention

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Cochrane Database of Systematic Reviews, Issue 4, 2008 (Status in this issue: *New search for studies completed, conclusions changed*)

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DOI: 10.1002/14651858.CD001735.pub3

This version first published online: 8 October 2008 in Issue 4, 2008.

Last assessed as up-to-date: 17 July 2008. ([Dates and statuses?](#))

This record should be cited as: McInnes E, Bell-Syer SEM, Dumville JC, Legood R, Cullum NA. Support surfaces for pressure ulcer prevention. *Cochrane Database of Systematic Reviews* 2008, Issue 4. Art. No.: CD001735. DOI: 10.1002/14651858.CD001735.pub3.

ABSTRACT

Background

Pressure ulcers (also known as bedsores, pressure sores, decubitus ulcers) are areas of localised damage to the skin and underlying tissue due to pressure, shear or friction. They are common in the elderly and immobile and costly in financial and human terms. Pressure-relieving beds, mattresses and seat cushions are widely used as aids to prevention in both institutional and non-institutional settings.

Objectives

This systematic review seeks to answer the following questions:

- (1) to what extent do pressure-relieving cushions, beds, mattress overlays and mattress replacements reduce the incidence of pressure ulcers compared with standard support surfaces?
- (2) how effective are different pressure-relieving surfaces in preventing pressure ulcers, compared to one another?

Search strategy

For this second update the Cochrane Wounds Group Specialised Register was searched (28/2/08), The Cochrane Central Register of Controlled Trials (CENTRAL)(2008 Issue 1), Ovid MEDLINE (1950 to February Week 3 2008), Ovid EMBASE (1980 to 2008 Week 08) and Ovid CINAHL (1982 to February Week 3 2008). The reference sections of included studies were searched for further trials.

Selection criteria

Randomised controlled trials (RCTs), published or unpublished, which assessed the effectiveness of beds, mattresses, mattress overlays, and seating cushions for the prevention of pressure ulcers, in any patient group, in any setting. Study selection was undertaken by at least two authors independently with a third author resolving uncertainty. RCTs were eligible for inclusion if they reported an objective, clinical outcome measure such as incidence and severity of new or pressure ulcers developed. Studies which only reported proxy outcome measures such as interface pressure were excluded.

Data collection and analysis

Trial data were extracted by one researcher and checked by a second. The results from each study are presented as relative risk for dichotomous variables. Where deemed appropriate, similar studies were pooled in a meta analysis.

Main results

For this second update 11 trials met the inclusion criteria bringing the total number of RCTs included in the review to 52.

Foam alternatives to the standard hospital foam mattress can reduce the incidence of pressure ulcers in people at risk. The relative merits of alternating and constant low pressure devices are unclear. There is one high quality trial comparing the different alternating pressure devices for pressure ulcer prevention which suggests that alternating pressure mattresses may be more cost effective than alternating pressure overlays.

Pressure-relieving overlays on the operating table have been shown to reduce postoperative pressure ulcer incidence, although two studies indicated that foam overlays resulted in adverse skin changes. Two trials indicated that Australian standard medical sheepskins prevented pressure ulcers. There is insufficient evidence to draw conclusions on the value of seat cushions, limb protectors and various constant low pressure devices as pressure ulcer prevention strategies.

A study of Accident & Emergency trolley overlays did not identify a reduction in pressure ulcer incidence. There are tentative indications that foot waffle heel elevators, a particular low air loss hydrotherapy mattress and two types of operating theatre overlays are harmful.

Authors' conclusions

In people at high risk of pressure ulcer development higher specification foam mattresses rather than standard hospital foam mattresses should be used. The relative merits of higher-tech constant low pressure and alternating pressure for prevention are unclear but alternating pressure mattresses may be more cost effective than alternating pressure overlays. Medical grade sheepskins are associated with a decrease in pressure ulcer development. Organisations might consider the use of some forms of pressure relief for high risk patients in the operating theatre. Seat cushions and overlays designed for use in Accident & Emergency settings have not been adequately evaluated.