Clinical use of interface pressure to predict pressure ulcer development: a systematic review
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CRD summary
This review found that there was evidence of a qualitative relation between interface pressure and the incidence and time to development or healing of pressure ulcers. No quantification of the predictive or prognostic value of interface pressure could be given. Despite some limitations in the review, the authors' conclusions are sufficiently cautious to be likely to be reliable.

Authors' objectives
To determine whether interface pressure can be used to predict the development of pressure ulcers or to determine the prognosis of an ulcer once developed.

Searching
PubMed, CIRRIE (Center for International Rehabilitation Research Information and Exchange) and REHABDATA were searched from 1970 to September 2006. Search terms were reported. Reference lists of identified studies were screened.

Study selection
Studies that used interface pressure measurement as a predictive or prognostic factor for the development or healing of pressure ulcers were eligible for inclusion. There were no restrictions in terms of population.

Included studies assessed patients who were sitting or lying. Patients were elderly patients at risk but free of pressure ulcers, patients who had already developed pressure ulcers and surgical intensive care patients. Follow-up ranged from 48 hours to 12 months. Studies assessed interface pressure using single cell pressure transducers or pressure mapping mats. Development and healing of pressure ulcers was evaluated by manual or visual inspection of skin or from photographs. A variety of methods were used to stage pressure ulcers.

Two reviewers selected studies for inclusion. Disagreements were resolved by a third reviewer.

Assessment of study quality
Two reviewers assessed methodological quality according to criteria modified from Hudak et al. (1998) and Altman (2001), which included criteria related to patient sample, patient follow-up, sitting load, predictive and prognostic factors, outcome and analysis. Studies were given a score according to the number of items fulfilled out of a maximum of 17. Studies that scored at least 9 points were considered to be of sufficient methodological quality. Disagreements were resolved through referral to a third reviewer.

Data extraction
Two reviewers extracted data. Disagreements were resolved through referral to a third reviewer.

Methods of synthesis
A narrative synthesis was presented.

Results of the review
Seven studies were included (n=539, range 12 to 207): four RCTs (n=414); one retrospective observational study (n=16); and two prospective observational studies (n=109). Six studies assessed prediction of pressure ulcers and one assessed prognosis of pressure ulcers once developed. All studies except one were judged to be of sufficient quality (the low-scoring study was retrospective).

Three studies (two RCTs and one retrospective study) found that a higher interface pressure was associated with a higher incidence of pressure ulcers. Three studies (one RCT and two prospective studies) found no relationship between interface pressure and development of pressure ulcers. One RCT found that lower interface pressure was associated...
with faster healing rates. The clinical and statistical significance of these findings was unclear.

Authors' conclusions
There was evidence of a qualitative relation between interface pressure and the incidence and time to development or healing of pressure ulcers. No quantification of the predictive or prognostic value of interface pressure could be given.

CRD commentary
The review addressed a clear question supported by inclusion criteria defined in terms of intervention, outcome and population. The literature search was adequate for published studies; no specific attempts were made to locate unpublished studies and so there was a possibility of publication bias. Appropriate steps were taken to minimise bias and errors at all stages of the review process. Study quality was assessed using appropriate criteria and the results were clearly presented and considered in the synthesis. A narrative synthesis was appropriate. Some details were summarised in a table. A lack of numerical and statistical data made it difficult to interpret the results. Despite some limitations in the review, the authors' conclusions are sufficiently cautious to be likely to be reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that there was a need for more fundamental research on the aetiology and development of pressure ulcers to gain more understanding of these ulcers and the relationship between interface pressure and the incidence of pressure ulcers. Larger randomised clinical trials were needed to establish a relation between predictive/prognostic factors and outcome measures. It was also important to account for the influence of individual mediating factors that might have an impact on the aetiology of pressure ulcers.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.