Prevention and treatment of pressure ulcers

Two systematic reviews show little evidence to support the choice of intervention to prevent and treat pressure ulcers, whereas a third suggests that bundles of interventions may be effective.

**Overview:** Between 1.1% and 1.3% of patients treated in hospital and community settings in England develop pressure ulcers during their care ([NHS Safety Thermometer Report](https://www.england.nhs.uk/wp-content/uploads/2019/11/NHS-England-SafetyThermometer-full-report-2019-July-2019-v5.pdf)). Pressure ulcers are estimated to cost the health service £1.4 to £2.1 billion a year, equivalent to 4% of annual NHS expenditure ([Bennett et al. 2004](https://www.nice.org.uk/guidance/ta91)). Some groups of people are particularly vulnerable to pressure ulcers, such as seriously ill patients, people with spinal cord injuries, older people who are immobile, patients who are obese, and patients with conditions that affect blood flow, such as diabetes.

Pressure ulcer is one of four conditions targeted by the NHS ‘Harm free’ care programme. This programme aims to help NHS organisations build quality improvement initiatives to eliminate pressure ulcers, falls, urinary tract infections in patients with a catheter, and new venous thromboembolism.

See the NICE Evidence Services topic page on [pressure ulcer](https://www.nice.org.uk/guidance/ta91) for a general overview of this condition.

**Current advice:** NICE guidance on [pressure ulcer prevention](https://www.nice.org.uk/guidance/ta91) (currently being [updated](https://www.nice.org.uk/guidance/ta91)) recommends that all people at risk of pressure ulcers should, as a minimum provision, be placed on a high specification foam mattress with pressure-relieving properties.

NICE guidance on [management of pressure ulcers](https://www.nice.org.uk/guidance/ta91) (also being [updated](https://www.nice.org.uk/guidance/ta91)) notes that there is no conclusive evidence that any one pressure-relieving support technology is superior to another.

Recommendations based on professional consensus include:

- People with a grade 1–2 pressure ulcer should, as a minimum provision, be placed on a high specification foam mattress or cushion with pressure-reducing properties, combined with very close observation of skin changes and a documented positioning and repositioning regimen.

- People with grade 3–4 pressure ulcers should, as a minimum provision, be placed on an alternating pressure mattress (replacement or overlay) or sophisticated continuous low pressure system.

NICE also recommends the use of modern dressings, such as hydrocolloids and foams, in preference to basic dressings, such as gauze, paraffin gauze and simple dressing pads.

The NICE Pathway on [pressure ulcer management](https://www.nice.org.uk/guidance/ta91) brings together all related NICE guidance and associated products on the condition in a set of interactive topic-based diagrams.

**New evidence:** Three systematic reviews have looked at the risk assessment, prevention and treatment of pressure ulcers in adults in acute and long-term care.
Chou et al. (2013) reviewed 67 randomised controlled trials and cohort studies looking at the effects of risk assessment tools and preventive strategies on the incidence and severity of pressure ulcers. Meta-analysis of the data in the studies identified was not possible because of the methodological limitations and clinical heterogeneity of the studies. Nevertheless, the authors concluded that risk assessment tools, such as the Waterlow scale, and most types of support surfaces, except for advanced static mattresses, had no effect on prevention of pressure ulcers. Likewise, nutritional support, repositioning, and dressings and pads had no clear beneficial effects, although a couple of trials reported some reduction in incident pressure ulcers with cleansers and fatty acid creams.

Smith et al. (2013) reviewed 174 studies of treatment strategies for adults with pressure ulcers, including randomised controlled trials, comparative observational studies and non-comparative series studies. Meta-analysis was done for the outcome of complete wound healing. Support surfaces, nutrition support, local wound applications and adjunctive therapies had no effect on complete wound healing compared with standard care, placebo or sham interventions. Some moderate-strength evidence suggested that air-fluidised beds, protein-containing nutritional supplements, electrical stimulation and application of radiant heat helped to reduce wound size.

Sullivan and Schoelles’ 2013 review of 26 studies focused on the factors associated with successful implementation of multicomponent preventive strategies (‘skin bundles’) for pressure ulcers. Common features of effective programmes were: education and training of healthcare staff; revision of protocols for assessing and documenting ulcers; audit and feedback; redesigning documentation and reporting processes; and use of risk prediction scores.

All three reviews highlighted the weakness of the evidence base, which comprises mostly small studies with considerable methodological limitations, and called for more high-quality studies on preventive and treatment interventions for pressure ulcers.

Commentary: “The conclusions of the high quality reviews by Chou et al. (2013) and Smith et al. (2013) will be disappointing for health professionals. Although it is already widely appreciated that advanced static support surfaces are better at preventing pressure ulcers than standard mattresses, it may surprise some that the Chou et al. (2013) review found no evidence in support of pressure ulcer risk scoring over clinical judgement. The positive conclusions of the Smith et al. (2013) treatment review are largely based on clinically irrelevant comparisons (for example, comparing air fluidised beds with standard mattresses) or surrogate outcomes, such as change in ulcer area, rather than time to complete healing.

“By contrast, the Sullivan and Schoelles (2013) review concluded that bundling prevention interventions together in multicomponent programmes reduces pressure ulceration – a surprising finding given the absence of effects detected for the single interventions studied by Chou et al. (2013) There are several possible explanations for the contrasting findings. One is that bundling several interventions together and raising awareness of pressure ulcer risk, together with education, audit and feedback, is much more effective than single interventions. Another explanation is that the Sullivan and Schoelles review took a more relaxed view of the risk of bias in the underlying studies, so the conclusions may be misleading.

“That said, identification of patients at risk, use of appropriate and effective support surfaces, and, possibly most importantly, regular inspection of skin condition with appropriate modification of prevention strategies, are essential components of best practice that should be employed anywhere that patients are at risk of pressure ulcers.” – Professor Dame Nicky Cullum, Professor of Nursing, University of Manchester

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