British Journal of Community Nursing

# Repositioning for pressure injury prevention in adults: a commentary on a Cochrane review

--Manuscript Draft--

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| **Manuscript Number:** | |
| **Full Title:** | Repositioning for pressure injury prevention in adults: a commentary on a Cochrane review |
| **Article Type:** | Professional Comment |
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# Repositioning for pressure injury prevention in adults: a commentary on a Cochrane review

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**Abstract**
Repositioning is regarded as an important intervention to prevent the development of pressure injuries in patients who are immobile. However, there is uncertainty as to the optimal regimen in terms of frequency and method of repositioning. This commentary summarises and critically appraises a Cochrane systematic review that assessed the clinical and cost effectiveness of different repositioning regimens on the prevention of pressure injuries in adults in any setting.

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## Abstract

Repositioning is regarded as an important intervention to prevent the development of pressure injuries in patients who are immobile. However, there is uncertainty as to the optimal regimen in terms of frequency and method of repositioning. This commentary summarises and critically appraises a Cochrane systematic review that assessed the clinical and cost effectiveness of different repositioning regimens on the prevention of pressure injuries in adults in any setting.


## Commentary on:

Gillespie BM, Walker RM, Latimer SL, Thalib L, Whitty JA, McInnes E, Chaboyer WP. Repositioning for pressure injury prevention in adults. Cochrane Database of Systematic Reviews 2020, Issue 6. Art. No.: CD009958. DOI: 10.1002/14651858.CD009958.pub3.

### Key Points

1. The evidence in the review did not establish a clear difference in the risk of pressure injury development in patients who were re-positioned every 2, 3 or 4 hours or between positioning using a 30-degree or 90-degree lateral position.
2. Decisions around repositioning regimens should be based on professional guidelines and should take into consideration individual patient factors such as skin and tissue tolerance, general medical condition, overall treatment objectives and comfort and pain.
3. Larger RCTs with greater numbers of participants, which also control for intrinsic and extrinsic factors, are needed to reliably detect treatment effects of different repositioning regimens.
4. Future research should assess quality of life and patient experience outcomes. Research in settings outside of 24-hour care establishments would be beneficial.

## Introduction

A pressure injury is defined as a soft tissue injury to a localised body part, which is caused by prolonged pressure and/or friction to the skin and is often caused by extended periods spent in bed or using a medical device (Edsberg et al., 2016). Pressure injuries have an impact on both the physical and mental health of patients (Galhardo et al., 2010; Lala et al., 2014). Having a pressure injury has been shown to be a predictor of longer hospital stays in elderly patients (Theisen et al., 2012) and patients with pressure injuries have a higher risk of mortality compared to those who do not (Song et al., 2019). Elderly patients and those with mobility problems are at particular risk of developing pressure injuries (Kim et al., 2022). Repositioning, where patients are regularly turned or moved into different positions to relieve pressure on one area of the body, is regarded as a key intervention to prevent pressure injury development and is recommended in clinical guidelines such as the National Institute for Health and Care Excellence (NICE) guidance on pressure ulcer prevention and management (NICE, 2014). However, the optimum regimen for frequency (how often patients are repositioned) and method of repositioning (for example, using tilt and/or lateral, supine, prone body position) is uncertain (Yap et al., 2022). Repositioning is also not without negative consequences. For patients, frequent repositioning has the potential to cause discomfort and to disrupt sleep (Langemo et al., 2022). For healthcare staff, repositioning requires substantial time to deliver and may result in musculoskeletal injuries (Weiner et al., 2015). It is therefore important to establish the optimal repositioning regimens that will be clinically effective whilst minimising negative effects on patients and staff. This Cochrane systematic review aimed to assess the clinical and cost effectiveness of different repositioning regimens on the prevention of pressure injuries in adults in any setting.

### Aim of commentary

This commentary aims to critically appraise the methods used within the review Gillespie et al., 2020 and expand upon the findings in the context of clinical practice.

## Methods

This protocol registered systematic review carried out a comprehensive search on the following databases: Cochrane Wounds Specialised Register; Cochrane Central Register of Controlled Trials (CENTRAL); Ovid Medline; Ovid Embase; EBSCO CINAHL; NHS Economic Evaluation Database (NHS EED). No date, language or other limits were applied to the search. The authors also searched clinical trials registers (ClinicalTrials.gov; World Health Organization International Clinical Trials Registry Platform (ICTRP); EU Clinical Trials Register) and conference abstracts from the American Professional Wound Care Association, Wounds Australia, and the European Wound Management Association. The reference lists of included trials and relevant systematic reviews were checked to identify further relevant publications. Only randomised controlled trials which included adults in any healthcare or long-term care setting without an existing pressure injury, and that compared repositioning regimens with usual care or with alternative repositioning regimens, were included in the review. Cross-over trials and quasi-randomised trials were excluded. Full or partial economic evaluations conducted within eligible RCTs were included in the review of economic evidence.

A robust screening and data extraction process was undertaken by three independent reviewers with arbitration by a third. Quality assessment was carried out by two reviewers using the Cochrane tool for assessing risk of bias and an overall summary of quality was produced using GRADE. The results were organised by the interventions compared and meta-analysis was undertaken where there was sufficient similarity in the primary intervention (repositioning frequencies and/or tilt regimens). Meta-analysis was undertaken using a random effects approach, or a fixed effect approach where there was minimal heterogeneity, and the pooled estimates were reported with a 95% confidence interval (95% CI). For dichotomous outcomes the summary estimate was reported

as a Risk Ratio (RR). Where outcome data could not be pooled the results of the included trials were summarised narratively. The economic studies were also reported separately using a narrative summary.

## Results

Eight trials and two economic sub-studies were included in the review. The eight trials involved a total of 3941 participants. Four trials were conducted in Europe (Spain; Belgium; Ireland; Wales), two in North America (US and Canada), and two in Asia (China and Iran). Three of the trials were conducted in care homes, four trials were conducted in intensive care units and one trial was conducted in an acute inpatient hospital setting.

The overall GRADE assessment for the eight included studies was judged as low to very low certainty for serious risk of bias. The main concerns were around lack of blinding of participants and personnel and imprecision caused by small sample sizes, missing data, or both. The results of 3 studies comparing 2-hourly repositioning with 4-hourly repositioning, using any support surface, were pooled together. It was unclear whether either regimen increased or decreased the incidence of pressure injury (RR 1.06, 95% CI 0.80 to 1.41, GRADE: very low [The true effect is probably markedly different from the estimated effect]). Two studies compared a 30° tilt with a 90° tilt, both using a 3-hourly repositioning schedule overnight, and their results were pooled together. There was no clear difference in the incidence of stage 1 or 2 pressure injuries between the two regimens (RR 0.62, 95% CI 0.10 to 3.97, GRADE: very low). Two studies compared 2-hourly repositioning with 3-hourly repositioning but could not be pooled because of statistical heterogeneity. However, neither study found a clear difference in risk of pressure injury between the two regimens (Bergstrom 2013: RR 4.06, 95% CI 0.87 to 18.98 GRADE: low [The true effect might be markedly different from the estimated effect]; Defloor 2005: RR 0.90, 95% CI 0.69 to 1.16, GRADE: very low). The certainty of evidence for the two studies was low and very low respectively due to high risk of bias.

Four other studies compared other frequency and positioning regimens. One study compared 3-hourly repositioning with 4-hourly repositioning and found that there may be a reduction in incidence of pressure ulcers with 3-hourly repositioning (RR 0.20, 95% CI 0.04 to 0.92 GRADE: low). Another study compared 4-hourly repositioning with 6-hourly repositioning and reported a 27% reduction in pressure injury incidence associated with 4-hourly repositioning (RR 0.73, 95% CI 0.53 to 1.02 GRADE: very low). One study compared prone positioning with supine positioning and reported that the incidence of stage 1 pressure injuries was higher in participants who were positioned prone, but no clear difference in the risk of stage 2 pressure injuries between the two groups (GRADE: low). Finally, one study compared 30° 2-hourly head of bed (HOB) tilt with a 45° 2-hourly HOB tilt or "standard care". Pressure injury incidence was not the primary outcome of the study; however, participants were assessed for pressure injuries and the authors reported that none of the participants developed pressure injuries after 3 days (GRADE: low).

Two studies reported economic data. One study did a cost-minimisation analysis comparing 3-hourly and 4-hourly repositioning to 2-hourly repositioning. The study estimated that the cost of repositioning was CAD 11.05 (2012 Canadian dollars) lower for 3-hourly repositioning, or CAD 16.74 lower for 4-hourly repositioning, per patient per day compared with the 2-hourly repositioning regimen. This was mainly based on the value of nursing time and with the assumption that there was no difference in pressure injury incidence between the different regimens. The other study did a cost-effectiveness analysis based on data from a cluster-RCT comparing a 30° tilt 3-hourly regimen to a 90° tilt 6-hourly regimen (standard care). The reported findings suggest that EUR 4650 (based on costs in 2009) would be saved in nurse time costs for every 100 patients treated with a 30° tilt 3-hourly regimen rather than the 90° tilt 6-hourly regimen. This was due to less time and less nurses required to perform each turn with the 30° tilt 3-hourly regimen.

## Commentary

Using the AMSTAR 2 critical appraisal tool for systematic reviews, 15 out of the 16 criteria were satisfactory. The criteria not met was related to not enough studies being included to enable the assessment and exclusion of publication bias. Overall, it is deemed that this systematic review provides an accurate and comprehensive summary of the results of the available studies that address the question of interest.

This review found no evidence of difference in the risk of pressure injury development in patients who are repositioned every 2, 3 or 4 hours or between positioning using a 30-degree or 90-degree lateral position. It is therefore not possible to make any direct recommendations to practice based on the evidence presented in this review. This lack of certainty is reflected within published guidelines within this area with varying recommendations being made regarding these potential moderating factors. The NICE guidance on pressure ulcer prevention and management (NICE, 2014) recommends that patients at risk of developing pressure ulcers should be repositioned at least every 6 hours and those at high risk at least every 4 hours. Conversely, the All Our Health guidance (Office for Health Improvement and Disparities, 2015), which sets out the core principles for healthcare professions and families for pressure ulcer prevention, recommends 2 hourly repositioning for those patients who need help. The European Pressure Ulcer Advisory Panel (EPUAP), National Pressure Injury Advisory Panel (NPIAP) and Pan Pacific Pressure Injury Alliance guidance from 2019 (EPUAP/NPIAP/Pan Pacific Pressure Injury Alliance, 2019) recommends that patients should have an individualised repositioning schedule, however no frequency is specified. It suggests consideration should be made to skin and tissue tolerance, general medical condition, overall treatment objectives and comfort and pain.

With regards to the method of repositioning, both the EPUAP/NPIAP/Pan Pacific Pressure Injury Alliance guidance (EPUAP/NPIAP/Pan Pacific Pressure Injury Alliance, 2019) and the NHS Improvement pressure ulcer core curriculum (NHS Improvement, 2018) recommend the use of the 30-degree tilt as the most effective method of repositioning in bed. However, the NICE guidelines

and All Our Health guidance make no recommendation about the most effective method of repositioning.

Taking into consideration the evidence from the review and current clinical guidelines it is not possible to specify that a 2 hourly or 3 hourly repositioning would be more effective than a 4 hourly regimen. However, patients at risk of developing pressure ulcers should be monitored closely and individual patient factors should be taken into consideration when considering a repositioning schedule. Based on the guidelines the 30-degree tilt is recommended as best practice compared to 90-degree lateral positioning.

This review has highlighted that there is insufficient evidence available to inform recommendations into practice. The review identified a limited number of RCTs investigating repositioning and concludes that small sample sizes in the studies made it difficult to reliably detect treatment effects. It is a challenge to recruit sufficiently large enough numbers of trial participants and to minimise variation in intrinsic and extrinsic factors such as patient risk level, mattress type, environment, and staff and patient knowledge. Therefore, although RCTs are considered the gold standard study design to inform and influence evidence-based practice it may be beneficial to review a broader evidence base including other study types such as observational studies which may yield bigger data sets. The review identified no trials that assess outcomes of quality of life or patient experience and given the potential negative effects of repositioning on patient comfort and sleep quality this should be considered in any future research. Additionally, there is lack of evidence of repositioning requirements for patients not in 24-hour care establishments. Many patients at risk of developing pressure injuries are cared for in their own homes and therefore this would benefit from further research.

## CPD reflective questions

- What are the strengths and limitations of the systematic review?

- What factors should be taken into consideration when considering a repositioning regimen for an individual patient?
- How similar is your current practice to the recommendations within the guidelines within this article?

*This research was partly-funded by the National Institute for Health and Care Research Applied Research Collaboration North West Coast (NIHR ARC NWC). The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health and Social Care.*

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