

**TITLE:** Patient Lifts and Transfer Equipment for Preventing Pressure Ulcers: A Review of Clinical and Cost-Effectiveness and Guidelines

**DATE:** 19 March 2013

## CONTEXT AND POLICY ISSUES

A pressure ulcer is an area of localized persistent injury to the skin that may include blisters, open wounds, or even necrosis, and which may extend to the underlying muscles and bones.<sup>1-3</sup> Tissue damage typically occurs as a result of sustained loading on a particular body area, sometimes accompanied with shear and friction.<sup>2,4</sup> If pressure is not relieved, the resulting oxygen deprivation negatively affects wound healing and is likely to cause further tissue destruction.<sup>2</sup> Therefore, any condition preventing patients from repositioning themselves comes as a major risk factor contributing to the development of pressure ulcers.<sup>2</sup>

Pressure ulcer prevention is a common health concern, whether in the context of acute intensive care units or long-term care setting. In Canada, it is estimated that the prevalence of pressure ulcers reaches 25% in acute care settings, and is close to 30% in non-acute care settings.<sup>5</sup> In addition to negatively impacting patients' quality of life, pressure ulcers may prolong hospital stay and are associated with an increased financial burden.<sup>2</sup> Although various interventions have been suggested in the literature to prevent pressure ulcers, the most widely agreed upon appears to be reducing pressure via repositioning patients regularly; however, optimal frequency and methods for repositioning remain a source of debate.<sup>2</sup>

This Rapid Response report aims to provide further information regarding the use of devices including various patient lifts and transfer equipment to reposition patients and therefore prevent pressure ulcers. This will inform decision-making regarding the optimization of ulcer prevention procedures in the intensive care unit.

## RESEARCH QUESTIONS

1. What is the clinical effectiveness of patient lifts and transfer equipment for the prevention of pressure ulcers?

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2. What is the cost-effectiveness of patient lifts and transfer equipment for the prevention of pressure ulcers?
3. What are the guidelines for the use of patient lifts and transfer equipment to prevent pressure ulcers?

**KEY FINDINGS**

There was no evidence in the literature searched pertaining to the clinical or cost-effectiveness of patient lifts and transfer equipment for the prevention of pressure ulcers. In addition, the various guidelines identified did not address in their recommendations the use of these turning devices to prevent pressure ulcers. Appendix 2 provides additional references pertaining to out-of-scope interventions, such as various turning regimens and multidisciplinary teams.

**METHODS**

**Literature Search Strategy**

A limited literature search was conducted on key resources including PubMed, CINAHL, The Cochrane Library (2013, Issue 1), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. The search was limited to English language documents published between Jan 1, 2008 and Feb 19, 2013.

**Selection Criteria and Methods**

One reviewer screened the titles and abstracts of the retrieved publications and examined the full-text publications for the final article selection. Selection criteria are outlined in Table 1.

**Table 1: Selection Criteria**

<b>Population</b>	Adult patients in the ICU at risk for pressure ulcers
<b>Intervention</b>	Turning devices (including sheets, lifts and mattresses)
<b>Comparator</b>	All lifting devices
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>• Any outcomes related to the clinical effectiveness and clinical benefits of using turning devices to prevent pressure ulcers.</li> <li>• Cost-effectiveness of using turning devices to prevent pressure ulcers.</li> <li>• Guideline recommendations related to the use of turning devices in ulcer prevention.</li> </ul>
<b>Study Designs</b>	Health technology assessments, Systematic reviews/Meta-analyses Randomized controlled trials Non-randomized studies Economic evaluations Guidelines

## **Exclusion Criteria**

Articles were excluded if they did not meet the selection criteria in Table 1, if they were published prior to January 2008, if they were duplicate publications of the same study, or if they were referenced in a selected systematic review.

## **Critical Appraisal of Individual Studies**

We elected to assess the quality of included systematic reviews using the Assessment of Multiple Systematic Reviews (AMSTAR) tool.<sup>6</sup> For included randomized controlled studies, the assessment tool selected was the SIGN 50 checklist.<sup>7</sup> We elected to assess the quality of the included non-randomized studies, and guidelines using Downs and Black,<sup>8</sup> and AGREE<sup>9</sup> checklists, respectively. We chose not to calculate a numeric score for each study, but to instead summarize and describe strengths and weaknesses of each study.

## **SUMMARY OF EVIDENCE**

### **Quantity of Research Available**

A total of 180 citations were identified in the literature search. Following screening titles and abstracts, 176 citations were excluded and 4 potentially relevant reports from the electronic search were retrieved for full-text review. Of the 4 potentially relevant reports, no publication met the inclusion criteria. As a result, no publication could be included in this review. Appendix 1 describes the PRISMA flowchart of the study selection for this review.

The interventions evaluated in this rapid response report were patient lifts and transfer equipment for preventing pressure ulcers, also referred to as turning devices. However, several references were found in the literature search pertaining to out-of-scope interventions that might still provide additional and relevant information, such as implementation of various turning regimens and multidisciplinary skin expert teams or turning teams. These additional references of potential interest are provided in Appendix 2.

## **CONCLUSIONS AND IMPLICATIONS FOR DECISION OR POLICY MAKING**

There was no evidence in the literature searched pertaining to the clinical or cost-effectiveness of patient lifts and transfer equipment for the prevention of pressure ulcers. In addition, the various guidelines identified did not address in their recommendations the use of these turning devices to prevent pressure ulcers. Therefore, these findings are insufficient to inform decision-making with regard to the optimization of ulcer prevention procedures in various healthcare settings such as the intensive care unit. However, additional references pertaining to out-of-scope interventions such as implementation of various turning regimens and multidisciplinary teams are provided in the appendix. Despite the fact that these were not relevant to this particular review report, they may still prove useful in addressing the common healthcare concern of pressure ulcer prevention.

### **PREPARED BY:**

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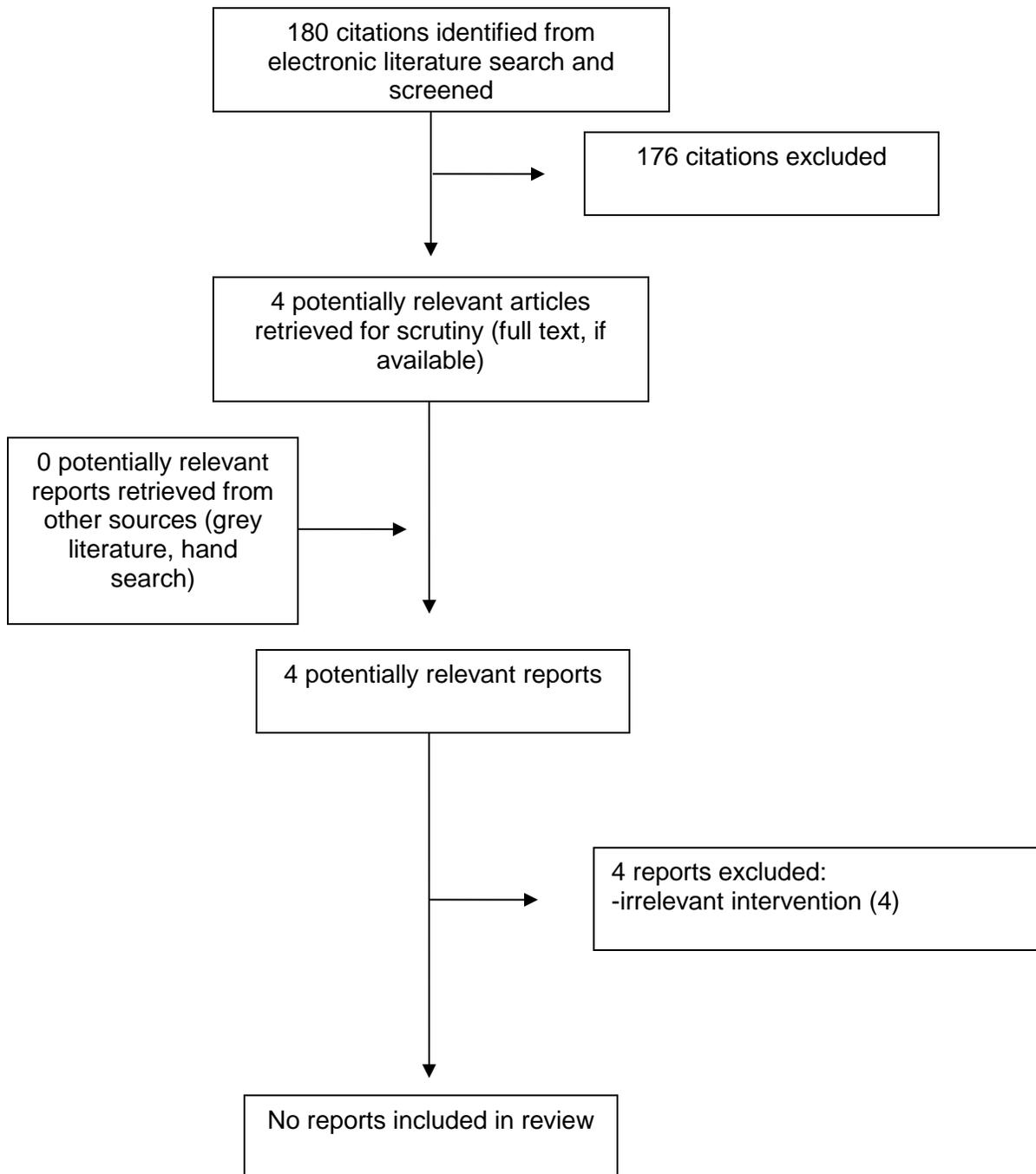
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9. The AGREE Collaboration. Appraisal of guidelines for research and evaluation (AGREE) instrument [Internet]. London: The AGREE Research Trust; 2001 Sep. [cited 2013 Feb 26]. Available from: <http://www.agreetrust.org/?o=1085>

APPENDIX 1: Selection of Included Studies



## APPENDIX 2: Other References Pertaining to Excluded Method of Interventions – Non Device-Related Interventions

The interventions evaluated in this rapid response report were patient lifts and transfer equipment for preventing pressure ulcers, also referred to as turning devices. However, several references were found in the literature search pertaining to out-of-scope interventions that might still provide additional and relevant information, such as implementation of various turning regimens and multidisciplinary skin expert teams or turning teams. These references, although not included in the report as per the pre-specified protocol, are listed here in appendix.

### Health technology assessments, Systematic reviews / Meta-analyses

Moore ZE, Cowman S. Repositioning for treating pressure ulcers. *Cochrane Database Syst Rev.* 2012;9:CD006898.

Reddy M. Pressure ulcers. *Clin Evid (Online).* 2011.

Systematic review of repositioning for the treatment of pressure ulcers. *EWMA Journal.* 2010 Jan;10(1):5-12.

Health Quality Ontario. Management of chronic pressure ulcers: an evidence-based analysis. *Ont Health Technol Assess Ser [Internet].* 2009 [cited 2013 Feb 26];9(3):1-203. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3377577>.

Health Quality Ontario. Pressure ulcer prevention: an evidence-based analysis. *Ont Health Technol Assess Ser [Internet].* 2009 [cited 2013 Feb 26];9(2):1-104. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3377566>.

Cullum N, Petherick E. Pressure ulcers. *Clin Evid (Online) [Internet].* 2008 [cited 2013 Feb 26]. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2907959>.

Krapfl LA, Gray M. Does regular repositioning prevent pressure ulcers? *J Wound Ostomy Continence Nurs.* 2008 Nov;35(6):571-7.

### Randomized controlled trials

Moore Z, Cowman S, Conroy RM. A randomised controlled clinical trial of repositioning, using the 30 degrees tilt, for the prevention of pressure ulcers. *J Clin Nurs.* 2011 Sep;20(17-18):2633-44.

Toronto Health Economics and Technology Assessment Collaborative [Internet]. Toronto: The Collaboration; 2013. TURN study (Turning for Ulcer Reduction); 2013 [cited 2013 Feb 26]. Available from: <http://theta.utoronto.ca/projects/?13>

### Non-systematic reviews

White-Chu EF, Reddy M. Pressure ulcer prevention in patients with advanced illness. *Curr Opin Support Palliat Care.* 2013 Mar;7(1):111-5.

Acton C. Reducing avoidable pressure ulcers: an online clinical ordering system. *Br J Nurs*. 2012 Nov 8;21(20):4, 6-4, 8.

Ostadabbas S, Yousefi R, Nourani M, Faezipour M, Tamil L, Pompeo M. A Resource-Efficient Planning for Pressure Ulcer Prevention. *IEEE Trans Inf Technol Biomed*. 2012 Aug 21.

Sprigle S, Sonenblum S. Assessing evidence supporting redistribution of pressure for pressure ulcer prevention: a review. *J Rehabil Res Dev*. 2011;48(3):203-13.

Hagisawa S, Ferguson-Pell M. Evidence supporting the use of two-hourly turning for pressure ulcer prevention. *J Tissue Viability*. 2008 Aug;17(3):76-81.

### **Non-randomized studies**

Still MD, Cross LC, Dunlap M, Rencher R, Larkins ER, Carpenter DL, et al. The turn team: a novel strategy for reducing pressure ulcers in the surgical intensive care unit. *J Am Coll Surg*. 2013 Mar;216(3):373-9.

Lahmann NA, Kottner J, Dassen T, Tannen A. Higher pressure ulcer risk on intensive care? - comparison between general wards and intensive care units. *J Clin Nurs*. 2012 Feb;21(3-4):354-61.

McGuinness J, Persaud-Roberts S, Marra S, Ramos J, Toscano D, Policastro L, et al. How to reduce hospital-acquired pressure ulcers on a neuroscience unit with a skin and wound assessment team. *Surg Neurol Int* [Internet]. 2012 [cited 2013 Feb 26];3:138. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3515926>.

Rich SE, Margolis D, Shardell M, Hawkes WG, Miller RR, Amr S, et al. Frequent manual repositioning and incidence of pressure ulcers among bed-bound elderly hip fracture patients. *Wound Repair Regen* [Internet]. 2011 Jan [cited 2013 Feb 26];19(1):10-8. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3059225>.

Tschannen D, Talsma A, Gombert J, Mowry JL. Using the TRIP model to disseminate an IT-based pressure ulcer intervention. *West J Nurs Res*. 2011 Apr;33(3):427-42.

Nijs N, Toppets A, Defloor T, Bernaerts K, Milisen K, Van Den BG. Incidence and risk factors for pressure ulcers in the intensive care unit. *J Clin Nurs*. 2009 May;18(9):1258-66.

Ballard N, McCombs A, Deboor S, Strachan J, Johnson M, Smith MJ, et al. How our ICU decreased the rate of hospital-acquired pressure ulcers. *J Nurs Care Qual*. 2008 Jan;23(1):92-6.

### **Guidelines**

Australian Wound Management Association. Pan Pacific guideline for the prevention and management of pressure injury [Internet]. Osborne Park (AU): Cambridge Media; 2012. [cited 2013 Feb 26]. Available from: [http://www.awma.com.au/publications/2012\\_AWMA\\_Pan\\_Pacific\\_Guidelines.pdf](http://www.awma.com.au/publications/2012_AWMA_Pan_Pacific_Guidelines.pdf)

Black JM, Edsberg LE, Baharestani MM, Langemo D, Goldberg M, McNichol L, et al. Pressure ulcers: avoidable or unavoidable? Results of the National Pressure Ulcer Advisory Panel Consensus Conference. *Ostomy Wound Manage*. 2011 Feb;57(2):24-37.

Stechmiller JK, Cowan L, Whitney JD, Phillips L, Aslam R, Barbul A, et al. Guidelines for the prevention of pressure ulcers. *Wound Repair & Regeneration*. 2008 Mar;16(2):151-68.