

The cost-effectiveness of gel-filled overlays for the prevention of pressure ulcers in surgical patients

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Executive Summary

Background

Pressure ulcers are localized tissue destruction caused by skin compression at bony prominences. Surgical patients are at particularly high risk. Prolonged immobility during surgery is associated with pressure-related tissue injuries to vulnerable bony areas, including the back, heels, hip, spine, elbows, shoulders, and back of the head, among others. Gel-filled overlays on operating tables have been shown to reduce new pressure ulcers but are not widely used. Commissioned by the Ontario Health Technology Assessment Committee (OHTAC), this study evaluates the cost-effectiveness of adding gel-filled overlays to standard operating tables for the prevention of pressure ulcers in hospitalized patients undergoing planned major surgical procedures.

Methods

We developed a Markov cohort model to simulate the natural history of pressure ulcers. We used Ontario data for prevalence and incidence of pressure ulcers, costs and health utilities. Content validation was provided by members of an expert panel convened by OHTAC. The model was calibrated to reproduce the prevalence of hospital-acquired pressure ulcers observed in annual skin assessment surveys conducted in three Toronto hospitals. The cost-effectiveness analysis used a 1-year time horizon and the perspective of the health care system. Main outcome measures included differences in pressure ulcer incidence, incremental cost and incremental quality-adjusted life years (QALYs), and incremental cost effectiveness ratios.

Results

Our model projected that gel-filled overlays reduced the risk of all pressure ulcers in surgical patients by 3.5% (95% credible interval: 3.1%, 3.9%) and the risk of severe pressure ulcers by 2.6% (2.3%, 3.1%). On average, 29 and 39 surgical patients would need to be supported by gel-filled overlays to prevent a stage 1-4 and stage 2-4 pressure ulcer, respectively. The gel-

filled overlay option both improved QALYs and reduced costs. The associated mean cost saving was \$224 (95% credible interval: \$33, \$902) per surgical patient; of which \$216 was related to direct inpatient costs averted. In probabilistic sensitivity analysis, gel-filled overlays had an 85% chance of being the dominant option.

Gel-filled overlays are currently used in 8 to 20% of OR departments in Ontario (an estimated 2,205 OR tables). The expanded use of gel-filled overlays to cover all OR tables would cost approximately \$2 million and result in the prevention of 4,233 to 4,868 cases with pressure ulcers per year. The aggregate health impact would be a gain of approximately 3.8 to 4.4 QALYs over the 122,000 to 144,000 targeted surgical patients per year. Direct healthcare costs would be reduced by \$26 to \$29 million per year. The direct cost saving to hospitals' annual budgets would be \$25 to \$28 million (equivalent to approximately 393 to 453 full-time equivalents of registered nurse time).

Interpretation

In acute-care hospitals with low utilization of pressure-redistribution support surfaces on OR tables, the expanded use of gel-filled overlays was associated with greater health benefits, lower direct inpatient costs, and reduced staff time. For these hospitals, the decision uncertainty regarding the expected efficiency of the adopted expansion is small. OHTAC recently recommended that a high density support surface should be used during surgical procedures longer than 90 minutes and stated that strongest evidence exists for using gel-filled overlays.

The remainder of this paper is currently undergoing peer review and may not be widely distributed at this time. If you need a full copy of this paper before it is published, please email William Witteman at william.witteman@theta.utoronto.ca Thank you for your understanding.

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