Early prevention of pressure ulcers among elderly patients admitted through emergency departments: a cost-effectiveness analysis

Pham B, Teague L, Mahoney J, Goodman L, Paulden M, Poss J, Li J, Ieraci L, Carcone S, Krahn M

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
The objective was to evaluate the cost-effectiveness of pressure-redistribution foam mattresses, on emergency department stretchers and beds, for the prevention of pressure ulcers in patients aged 65 years or older. The authors concluded that the evidence supported early prevention with pressure-redistribution foam mattresses in the emergency department. The methods were good and the results were presented clearly and in detail. The authors’ conclusions appear to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to evaluate the cost-effectiveness of pressure-redistribution foam mattresses, on emergency department stretchers and beds, for the prevention of pressure ulcers in patients aged 65 years or older.

Interventions
Standard mattresses on beds (five inches) and stretchers (three inches), in the emergency department, were compared with pressure-redistribution foam mattresses of eight inches on beds and five inches on stretchers.

Location/setting
Canada/emergency care.

Methods
Analytical approach:
A Markov model, with a time horizon of one year, was used to combine the published data. The authors reported that the perspective was that of the health care system.

Effectiveness data:
The effectiveness data were from systematic reviews of pressure ulcer prevention, a survey of pressure ulcer prevalence in Canadian hospitals, a large study of home care in Ontario, and other literature searches. The main effectiveness parameter was the relative risk of pressure ulcers with or without the pressure-redistribution mattresses. These estimates were from a randomised trial of emergency department patients, that was identified by two published systematic reviews of pressure ulcer prevention.

Monetary benefit and utility valuations:
The utility estimates were from studies that used the Health Utilities Index (HUI). These estimates were identified by the searches performed for the effectiveness data.

Measure of benefit:
The benefit measure was quality-adjusted life-years (QALYs) gained.

Cost data:
The direct costs included the mattresses and the treatment of pressure ulcers, which included ward care, drugs, overheads, capital depreciation, and home care upon discharge from hospital. The costs for the mattresses were from a
telephone survey of three mattress manufacturers. The cost of treating pressure ulcers in hospital was from 47 teaching and community hospitals in Ontario; the costs for patients with pressure ulcers were compared with those without them. The home care costs were similarly calculated from a large database of home care in Ontario. The price year was 2009. All costs were reported in Canadian dollars (CAD).

Analysis of uncertainty:
One-way sensitivity analyses were undertaken by varying the key model inputs over plausible ranges. The impact of including effectiveness estimates, for pressure-relieving mattresses, in health care settings other than the emergency department was assessed, and a hospital perspective was analysed. A probabilistic sensitivity analysis, with distributions applied to all the model parameters, and value-of-information analyses were undertaken.

Results
The average health care cost was CAD 6,901 for patients receiving pressure-redistribution mattresses, compared with CAD 6,933 for patients receiving standard mattresses. The quality-adjusted life-days gained per patient receiving a pressure-redistribution mattress were 153.3703 compared with 153.3688 per patient receiving a standard mattress.

Pressure-redistribution mattresses were dominant over standard mattresses, as they were more effective and less costly.

The probabilistic sensitivity analysis showed that pressure-redistribution mattresses were cost-effective, at CAD 50,000 per QALY gained, in 81% of simulations.

Authors' conclusions
The authors concluded that the evidence supported early prevention with pressure-redistribution foam mattresses in the emergency department. The mattresses could improve health and save costs for the hospital.

CRD commentary
Interventions:
The interventions were reported in full and were appropriate comparators.

Effectiveness/benefits:
The effectiveness data were from systematic reviews, a survey, a large database, and literature searches. The literature searches were not described, but a broad range of sources was used and it is likely that all relevant information was analysed. The clinical parameters, their sources, mean values, and plausible ranges or standard errors were provided. The main clinical effectiveness estimate was from one randomised controlled trial, which was identified by two systematic reviews and should have had good internal validity. The benefit measure appears to have been appropriate, as it incorporated morbidity and mortality. The derivation of the benefit measure was sufficiently reported.

Costs:
The perspective was clearly reported and it appears that all the relevant cost categories were included. The resource quantities and costs were adequately reported. The costs were appropriately adjusted for inflation.

Analysis and results:
The analytical approach appears to have been appropriate. The model structure was described and a diagram was available in an online appendix. The results were clearly presented. Extensive sensitivity analyses were performed, including one-way, probabilistic, and value-of-information analyses, to capture the overall model uncertainty and to determine research priorities. As a limitation to their study, the authors reported that there was a lack of clinical data on the risk and incidence of pressure ulcers in the emergency department.

Concluding remarks:
The methods were good and the results were presented clearly and in detail. The authors' conclusions appear to be appropriate.

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