Clinical utility and economic impact of introducing a bowel management system


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
This study examined the clinical and economic impact of introducing a bowel management system compared with reactive management of faecal soiling by cleansing and changing dressings, for critically ill patients with burns. The authors concluded that the proactive use of the bowel management device reduced some infectious sequelae and was cost saving. The study was well reported, but had some methodological drawbacks. Further studies are required to corroborate these findings.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study examined the clinical (reduction of urinary tract and soft tissue infections) and economic impact of introducing a bowel management system in critically ill patients with burns.

Interventions
The bowel management system was compared with reactive management of faecal soiling by cleansing and changing dressings. The system was a specially designed catheter and collection bag that safely and effectively diverted and collected stools and gastrointestinal waste.

Location/setting
USA/critical care unit, at a centre for burns.

Methods
Analytical approach:
The analysis used data from a single study that were entered into a simple decision tree. The authors did not explicitly state the perspective adopted.

Effectiveness data:
These data were from a retrospective comparative study with a historical control. The bowel management system was introduced at the authors' institution in September 2003. The medical records of patients treated between September 2003 and August 2005 were used for the bowel management system group. These patients were matched, in their gender, total body surface area burned, burn location, ventilation days, and hospital length of stay, with control patients, who were treated at the same institution between January 2000 and March 2003. There were 106 patients in each group and their data were analysed until hospital discharge. The key endpoint was the rate of urinary tract, and skin and soft tissue infections and these were identified using the hospital database.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
No summary benefit measure was used. The rates of urinary tract, and skin and soft tissue infections were used as the key clinical endpoints.

Cost data:
The economic analysis included three main cost categories: the bowel management system (catheter, collection bags,
daily catheter irrigation, and stool modification), the management of faecal soiling (laundring of linens, basic dressing changes, analgesia, and sedation), and the treatment of a urinary tract or skin and soft tissue infection. Nursing labour was not included. All costs were from the authors’ institution, except those for treating a urinary tract or skin and soft tissue infection, which were estimated from published reports. Resource consumption was based on data directly from the sample of patients enrolled in the clinical study. All costs were in US dollars ($).

Analysis of uncertainty:
A deterministic one-way sensitivity analysis was undertaken, to identify the most influential inputs, by varying the infection rates and the cost or frequency of in-bed soiling episodes.

Results
The rate of skin and soft tissue infections was 19.8% with the bowel management system and 46.2% in the control group (p<0.01). The rate of urinary tract infections was 14.2% with the bowel management system and 27.4% in the control group (p<0.05).

The expected costs were $1,582 with the bowel management system and $13,427 in the control group.

The bowel management system was dominant as it was more effective and less costly. The sensitivity analysis showed that the cost of soiling was the most influential input, but the bowel management system remained the preferred option in most of the scenarios.

Authors’ conclusions
The authors concluded that the proactive use of the bowel management device reduced some infectious sequelae and was cost saving.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear as the proposed device was compared with the usual care in the authors’ institution. A detailed description of the bowel management system was given.

Effectiveness/benefits:
The study design was limited due to the lack of a direct comparison between the study groups. These were well matched in their baseline characteristics, but were assessed in two different time periods and an impact of factors other than the interventions cannot be ruled out. The authors did not justify the sample size and its selection. The patients were identified at a single institution and caution is required if extrapolating these results to other settings.

Costs:
The economic viewpoint was not reported, but the costs relevant to the hospital appear to have been included. The authors justified the exclusion of nursing labour costs as they were similar between the groups. The cost categories were itemised and some of the unit costs and resource quantities were reported. The economic analysis appears to have been transparently presented, but the price year was not reported and this would have been useful for reflation exercises in other time periods.

Analysis and results:
A synthesis of the costs and benefits was not carried out as a cost-consequences analysis was performed. The results were clearly presented. The issue of uncertainty was investigated, by means of a partial approach, which did not consider multiple input variations. The authors acknowledged that the main limitation of their analysis was the design of their clinical study.

Concluding remarks:
The study was well reported, but had some methodological drawbacks. Further studies are required to corroborate these findings.
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