Cost-effectiveness analysis of ED decision making in patients with non-high-risk heart failure

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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 cost-effectiveness of three emergency department strategies for patients with acute decompensated heart failure that was not high risk; discharge home, observation unit admission, or in-patient admission. The authors concluded that observation unit admission was cost-effective compared with home discharge, but hospital admission became economically attractive with increased adverse events in the other two strategies. There were limitations in the methods and the data sources were not extensively described. Caution is required when interpreting the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
This study examined the cost-effectiveness of three emergency department strategies for patients with low- or medium-risk acute decompensated heart failure: discharge home, observation unit admission, or in-patient admission. The analysis was conducted for 60-year-old patients.

Interventions
The three strategies in the emergency department were discharge home, admission to an observation unit, or in-patient admission.

Location/setting
USA/emergency department.

Methods
Analytical approach:
The analysis was based on a decision analytic model that simulated patient management in the three strategies over a time horizon of 30 days. The authors stated that a societal perspective was adopted.

Effectiveness data:
The clinical data came from published literature, but the details of a search were not reported. The sources included large acute decompensated heart failure registries and published studies, but few details of these sources were given. The readmission rates after discharge were the key inputs. Some assumptions based on authors’ opinions were made to determine the probabilities for patients with low- and medium-risk acute decompensated heart failure, from the overall patient population.

Monetary benefit and utility valuations:
The details of the derivation of the utility values were not given, but some appear to have come from a published study that used the Quality of Well-being scale.

Measure of benefit:
Quality-adjusted life-years (QALYs) and life-years (LYs) were the summary benefit measures. LYs were not discounted, while QALYs were discounted at 3%.
Cost data:
The economic analysis included the costs of hospital and professional services. Most of the economic data were from Medicare reimbursement rates and national physician fee schedules. All costs were in US dollars ($) and the price year was 2005. The costs were reported both without discounting and discounted at an annual rate of 3%.

Analysis of uncertainty:
A deterministic one-way sensitivity analysis was undertaken on the key model inputs, such as the relative risk of early and late events, and the underlying severity of acute decompensated heart failure. The sources of the alternative assumptions were not reported.

Results
In a typical 60-year-old patient, home discharge gained 4.52 years at a cost of $33,262. Both observation unit and in-patient admission were more effective and more costly than home discharge. The undiscounted incremental cost per LY gained with observation unit admission was $23,678 over home discharge. Hospital admission gained 4.56 LYs at a cost of $37,621, with an incremental cost per LY gained of $246,671. Compared with home discharge, the incremental cost per QALY gained was $44,249 with observation unit admission and $684,101 with hospital admission.

The sensitivity analysis showed that observation unit admission was cheaper and more effective (i.e. dominant) than home discharge if the absolute risk for early readmission exceeded 36%, or the absolute risk of late readmission exceeded 74%. Variations in the other model inputs were less influential. Only when the risk of complications was very high or the probability of in-patient admission after the observation unit increased to over 27%, did in-patient admission become the most cost-effective strategy.

Authors’ conclusions
The authors concluded that observation unit admission was cost-effective compared with home discharge, but hospital admission became economically attractive with increased adverse event rates in the other two strategies.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear and they were likely to be relevant emergency department strategies in most health care systems.

Effectiveness/benefits:
The method used to identify the relevant sources of data was not clear. A literature review appears to have been carried out, but its methods and conduct were not reported. Very limited information was given on the sources of evidence and this limits the possibility of objectively assessing the validity of the clinical inputs and the utility estimates. The inclusion and exclusion criteria for the eligible patients were explicitly presented. Both benefit measures were appropriate as survival and quality of life were relevant dimensions of health for patients with acute decompensated heart failure that was not high risk.

Costs:
The analysis of costs appears to have been consistent with the perspective. Productivity costs were not considered, but this might have been appropriate given the age of the patient population. The price year, the use of discounting, and the data sources were reported, but the costs and quantities were not presented separately, with costs reported as total categories. While this approach was consistent with the use of reimbursement data, it limits the transparency of the economic analysis. The costs were treated deterministically, but some key cost categories were varied in the sensitivity analysis.

Analysis and results:
Only selected results were presented, but the incremental approach was appropriate for identifying the best strategy. Extensive details of the decision model were presented and a justification for the selection of the time horizon was provided. Both discounted and undiscounted results were presented. The issue of uncertainty was not fully investigated as the analysis was deterministic and considered only some individual inputs. The authors acknowledged some limitations of their analysis, which mainly related to the low quality of some of the clinical sources.
Concluding remarks:
There were limitations in the methods and the data sources were not extensively described. Caution is required when interpreting the authors’ conclusions.

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