Cost-effectiveness of telemetry for hospitalized patients with low-risk chest pain

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 admission from an emergency department to a hospital bed with telemetry (remote monitoring) versus to an unmonitored bed, for patients with low-risk chest pain. The authors concluded that telemetry was cost-effective if patients had a likelihood of acute coronary syndrome higher than 3% or there was minimal delay in obtaining and cost associated with a monitored bed. The economic evaluation was valid and used conservative assumptions to ensure that the authors’ conclusions are robust.

Type of economic evaluation
Cost-utility analysis

Study objective
This study examined the cost-effectiveness of admission to hospital bed with telemetry (remote monitoring) versus admission to an unmonitored hospital bed, for patients with low-risk chest pain admitted from an emergency department.

Interventions
The two interventions were admission to a telemetry setting versus admission to an unmonitored setting.

Location/setting
USA/emergency department.

Methods
Analytical approach:
The analysis was based on a decision-tree model, for a hypothetical, 55-year-old patient with low-risk chest pain, but otherwise healthy. A lifetime horizon was considered. The authors stated that the analysis was carried out from a societal perspective.

Effectiveness data:
The clinical data appear to have been from a selection of relevant sources. Most of the studies were conducted in the USA and a number of simplifying assumptions were made. The prevalence of acute coronary syndrome was a key input for the model.

Monetary benefit and utility valuations:
The utility values were derived from a published review of various health states and quality of life.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure and were discounted at an annual rate of 3%.

Cost data:
The economic analysis included the costs of telemetry, delayed telemetry hospital admission, hospitalisation for chest pain or dysrhythmia, and cardiac arrest from myocardial infarction (until discharge or death), and the annual costs of disability and coma. The costs and resource quantities were from Medicare reimbursement rates, National Physician Fee Schedules, and published studies. The cost of telemetry was from the authors’ institution. All costs were in US dollars ($) and the price year was 2009. The long-term costs were discounted at an annual rate of 3%.
Analysis of uncertainty:
One-way sensitivity analyses were carried out on all the model inputs to evaluate whether telemetry achieved an incremental cost-utility ratio below the threshold of $50,000 per QALY.

Results
The projected costs were $11,558.78 with unmonitored admission and $11.858.45 with telemetry admission. The QALYs were 17.9587 without monitoring and 17.9632 with telemetry.

The incremental cost per QALY gained with telemetry over no monitoring was $67,484.55.

The sensitivity analysis showed that telemetry achieved an incremental cost per QALY gained lower than $50,000: if the probability of acute coronary syndrome was above 0.03, if the probability of cardiac arrest exceeded 0.004, if the probability of delay to telemetry was less than 0.52, if the cost of telemetry delay was less than $119, if the probability of shockable dysrhythmia was above 0.83, if the probability of survival after defibrillation was over 0.63, or if the probability of minimal disability after cardiac arrest was over 0.56.

Authors' conclusions
The authors concluded that telemetry was cost-effective, if patients had a likelihood of acute coronary syndrome above 3% or of cardiac arrest above 0.4%, or there was a minimal delay in obtaining and cost associated with a monitored bed.

CRD commentary
Interventions:
The comparators were appropriately selected as the two available admission settings were considered for these patients.

Effectiveness/benefits:
The approach used to identify the sources of clinical evidence and the characteristics of these sources were not reported. The authors acknowledged as a limitation of their analysis that, in some cases, the studies selected did not exactly match the population of this study. In general, it is not possible to judge the validity of the clinical data, but extensive sensitivity analyses were conducted on these inputs. Limited information on the derivation of the utility values was given. QALYs were an appropriate benefit measure for these patients as acute coronary syndrome affects both survival and quality of life.

Costs:
The categories of costs reflected the reported perspective. In general, valid sources were used and they were those often used for the US setting. The unit costs and resource quantities were not reported separately, but a detailed list of total costs by item was provided. The costs of telemetry were from one institution and these might vary between hospitals, but sensitivity analysis was conducted on this parameter. The price year and discount rate were reported.

Analysis and results:
The results were extensively presented. An appropriate incremental approach was used to synthesise the costs and benefits of the two strategies. Conventional discounting was applied to both the costs and benefits. The uncertainty was investigated, using a deterministic approach, and the findings were clearly presented and discussed. The analysis appears to be specific to the authors' context and might be difficult to transfer to other settings.

Concluding remarks:
The economic evaluation was valid and used conservative assumptions to ensure that the authors' conclusions are robust.

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