A cost analysis of febrile neutropenia management in Australia: ambulatory v. in-hospital treatment

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 study examined the cost-effectiveness of ambulatory care strategies compared to standard in-hospital care for adult febrile neutropenic oncology patients at low risk of developing medical complications. The authors concluded that hospital early discharge with outpatient follow-up was the most cost-effective strategy compared to standard care for management of febrile neutropenia. The analysis was based on a sound methodological approach which focused on the economic comparison of the three strategies. The authors’ conclusions appear robust.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The study examined the cost-effectiveness of ambulatory care strategies compared to standard in-hospital care for adult febrile neutropenic oncology patients at low risk of developing medical complications.

Interventions
Two ambulatory strategies were considered.

Strategy one assumed outpatient care for the entire episode of febrile neutropenia and consisted of patient assessment in an outpatient facility on day one, outpatient follow-up on days two, three and approximately day seven to confirm neutrophil recovery. There was intermittent telephone follow-up between days three and seven while the patient was based at home.

Strategy two was an early discharge strategy after brief in-patient hospitalisation (at least 24 hours) for patient evaluation and initial monitoring of symptoms, followed by reviews in an outpatient facility until resolution of febrile neutropenia.

Strategy three (the comparator) was in-patient hospital treatment until resolution of febrile neutropenia.

Location/setting
Australia. In-patient and outpatient setting.

Methods
Analytical approach:
The analysis was based on a decision tree model with a short-term time horizon corresponding to the duration of the febrile neutropenia episode. The authors stated that the analysis took the perspective of an Australian public hospital.

Effectiveness data:
A literature review was undertaken to identify valid sources of evidence regarding clinical inputs of the model. Details of the studies used to derive these data were not clearly stated. Some assumptions were made. Data on mortality risk, complications and rate of misclassification associated with the three strategies were taken from the published literature and represented a key input of the analysis. The efficacy of oral antibiotics appeared to be from a Cochrane Review.

Monetary benefit and utility valuations:
Measure of benefit:
The rate of re-admissions avoided was used as the summary benefit measure.

Cost data:
The economic analysis included the direct medical costs associated with management of febrile neutropenia events. Ambulatory costs consisted of laboratory investigations and salaries of personnel. These costs were estimated from official price lists such as the Australian Medicare Benefits Schedule and Victorian Public Health Sector Heads of Agreement. Hospital costs were included in the in-patient care strategy and were taken from the Victorian State Department of Health which also provided data on case-mix classification. Costs were in Australian dollars ($) and referred to the 2009 to 2010 financial year.

Analysis of uncertainty:
A probabilistic approach was used to deal with the issue of uncertainty. The triangular distribution method was used to define confidence intervals (CIs) around model inputs. One- and two-way sensitivity analyses were carried out.

Results
The expected weighted average cost was $3,202 with outpatient only, $3,464 with early discharge and $4,934 with standard care. These costs included the cost of readmission in case of failure. Strategy one was the cheapest option. Strategy two avoided some re-admission and might be more convenient to patients. The corresponding success rate (avoided re-admissions) was 0.8, 0.9338 and 1.0. The incremental cost per re-admission avoided was $1,958 with early discharge and $8,660 with standard care.

In no scenarios examined in the two-way sensitivity analyses was standard care cheaper than either outpatient strategy.

Authors' conclusions
The authors concluded that a hospital early discharge strategy with outpatient follow-up for management of febrile neutropenia was the most cost-effective strategy compared to standard care.

CRD commentary
Interventions:
The selection of the comparators was appropriate as the authors compared the two proposed ambulatory protocols to the conventional pattern of care for oncology patients with febrile neutropenia.

Effectiveness/benefits:
Little information was provided on sources of clinical inputs. The efficacy of oral antibiotics appeared to be taken from a Cochrane systematic review and this should ensure an appropriate selection of studies. No other details on sources were provided. The study focused on the economic side and readmissions were used as main outcome.

Costs:
The economic analysis was consistent with the viewpoint of a public hospital in terms of data sources and types of costs included. Transparent information on unit costs and quantities of resources used was provided and enhanced the external validity of the economic analysis. Statistical analyses of costs were appropriately carried out to consider the issue of variability around economic estimates. Details of these analyses were reported clearly. Sources of economic data reflected the authors’ setting. Costs of hospitalisation were based on diagnosis-related groups that were described and weighted. Reflation exercises in other time periods were possible as the price year was clearly stated. The comparison of the economic impact of the three strategies was the main focus of the study and was satisfactorily carried out, considering the effect of alternative assumptions.

Analysis and results:
An incremental approach was used appropriately to combine costs and benefits of the alternative strategies. Model outcomes were reported clearly. It appeared that valid approaches were used to investigate the issue of uncertainty using deterministic and probabilistic methodologies. Little details on the clinical side of the study were given as the analysis focused on economics. The study results were specific to the Australian setting and did not appear to be transferable to
other jurisdictions.

Concluding remarks:
The analysis was based on a sound methodological approach which focused on the economic comparison of the three strategies. The authors’ conclusions appear robust.

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