A cost-effectiveness evaluation of hospital discharge counseling by pharmacists
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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
The objective was to assess the cost-effectiveness of pharmacist discharge counselling, to prevent medication-related morbidity, in high-risk adults aged 65 years or older, and for US hospital patients in general. The authors concluded that counselling was likely to be cost-effective and might be cost saving, particularly for high-risk elderly patients. The methods were adequate, but there were few published data, and the outcome measure was very specific; the authors’ conclusions should be considered with caution.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the cost-effectiveness of pharmacist discharge counselling, to prevent medication-related morbidity, in high-risk adults aged 65 years or older, and for US hospital patients in general.

Interventions
The study assessed pharmacist-led counselling for patients who were being discharged from hospital. This was compared with no patient counselling.

Location/setting
USA/community care.

Methods
Analytical approach:
A decision analytic model was developed to assess the costs and outcomes for the two options. The authors stated that a health care system perspective was adopted.

Effectiveness data:
The clinical and effectiveness data were from published studies, which included case-control and cohort studies. A systematic review of the literature was undertaken in PubMed and on the Internet, searched using Google Scholar, for the years 1990 to 2010. Studies had to assess interventions or activities that included pharmacist-provided counselling, report the outcomes of medication counselling, and include high-risk patients, patients receiving polypharmacy, or patients with chronic diseases. The main measure of effectiveness was the percentage of medication errors. This estimate was from a published study.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The measure of benefit was the probability of having no adverse drug events.

Cost data:
The direct costs included those of the pharmacist-led counselling (including time spent by pharmacy technicians and pharmacists), emergency department visits, and readmissions to hospital. The costs of the pharmacist-led counselling were from published literature, and those of emergency department visits and hospital readmissions were from a published study. All costs were updated to 2010 prices, using the consumer price index, annual inflation rate. The
currency was US $.

Analysis of uncertainty:
A probabilistic sensitivity analysis was used to run 10,000 Monte Carlo simulations, sampling across all parameter distributions simultaneously. The results were presented, using 95% confidence intervals and cost-effectiveness acceptability curves.

Results
For general patients, the probability of having no adverse drug events was 1.00 (95% CI 1.00 to 1.00) with pharmacist-led counselling and 0.99 (95% CI 0.99 to 0.99) with no counselling. The average cost per patient was $25 (95% CI 19 to 33) with pharmacist-led counselling and $25 (95% CI 19 to 32) with no counselling.

For high-risk elderly patients, the probability of having no adverse drug events was 1.00 (95% CI 0.99 to 1.00) with pharmacist-led counselling and 0.98 (95% CI 0.97 to 0.98) with no counselling. The average cost per patient was $21 (95% CI 16 to 27) with pharmacist-led counselling and $48 (95% CI 38 to 60) with no counselling.

The probabilistic sensitivity analyses showed that at a willingness-to-pay threshold of $10,000 per successfully treated patient (no adverse drug events), pharmacist-led counselling was cost-effective in all simulations, for general patients, and it was dominant for high-risk elderly patients, as it was more effective and less costly than no counselling, in all simulations.

Authors' conclusions
The authors concluded that discharge counselling by pharmacists was likely to be cost-effective and might be cost saving, particularly for high-risk elderly patients.

CRD commentary
Interventions:
The intervention was described sufficiently.

Effectiveness/benefits:
The clinical and effectiveness data were from published studies, identified by a systematic review. The sources searched, key terms, and inclusion and exclusion criteria were reported, but only PubMed was searched and Google Scholar was used to search the Internet; some relevant studies may have been missed. The study that provided the main measure of effectiveness was conducted in 1993, and medical practice could have changed since this study was performed. The authors used a very narrow measure of effectiveness (no adverse drug events), making comparability of the cost-effectiveness of the intervention with that of interventions for other diseases difficult, and they acknowledged that this was a limitation of their study.

Costs:
The perspective of the health care system was explicitly reported, and no cost category was omitted. The authors reported that out-patient physician costs and medication costs were not included because they were assumed to be equal, for both patient groups. They did not report the duration of the study, making it impossible to determine if discounting was appropriate. The price year and inflationary exercises were adequately reported.

Analysis and results:
The cost and outcome information was synthesised using a decision-tree model. The details of the model structure were provided, with a diagram. Uncertainty in the model's results was tested in a probabilistic sensitivity analysis. The authors discussed the limitations of their study, including the lack of trial data, and the lack of published research on the incidence, costs and consequences of medication errors.

Concluding remarks:
The methods were adequate, but there was a lack of published data, and the outcome measure was very specific, so the authors' conclusions should be considered with caution.
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