The cost-effectiveness of computer-assisted anticoagulant dosage: results from the European Action on Anticoagulation (EAA) multicentre study


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 aim was to assess the cost-effectiveness of computer-assisted dosing compared with manual dosing of oral anticoagulants. The authors concluded that the two computer-assisted dosing programs were equally clinically effective and were cost saving, compared with manual dosing, which indicated that they were cost-effective. The methods were good and the results were well reported and reliable. The conclusions appear to be appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the cost-effectiveness of computer-assisted anticoagulant dosing compared with manual dosing of oral anticoagulants.

Interventions
Computer-assisted dosing of oral anticoagulants, using one of two computer programs (DAWN AC or PARMA 5), was compared with manual dosing of oral anticoagulants.

Location/setting
Europe/secondary care.

Methods
Analytical approach:
The effectiveness, cost, and health care use data were collected in a multinational randomised controlled trial (Poller, et al. 2008, see 'Other Publications of Related Interest' below for bibliographic details). The time horizon of the trial was 4.5 years and the authors stated that the study took a health care payer perspective.

Effectiveness data:
The effectiveness data came from a randomised controlled trial, with a follow-up of 4.5 years. The primary outcomes were clinical events related to anticoagulant therapy (bleeding or thrombosis) and control of the international normalised ratio (INR), expressed as a percentage of time within the INR range. The sample was 13,219 patients, with 6,218 randomised to manual dosing and 6,366 randomised to computer-assisted dosing.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
The primary measure of benefit was the number of adverse events prevented during the trial follow-up period. The percentage of time in the INR range was a secondary measure of benefit.

Cost data:
The cost categories included the anticoagulation clinic visit costs that were attributable to the method of dosing and the costs of clinical events related to anticoagulation. The resource use data were collected prospectively during the trial and valued using UK National Health Service reference costs in 2006 UK pounds sterling (£) and converted into Euros.
(EUR) using the Purchasing Power Parity Index.

Analysis of uncertainty:
Sensitivity analyses were performed to assess the variation in the results for subgroups of patients. For example, those with alternative clinical indications and new compared with established anticoagulant patients. Variations in training costs and the cost of the write-off time for software were also tested.

Results
The number of clinical events per patient was 0.086 in the manual group and 0.078 in the computer-assisted group; a reduction of 0.008 with computer-assisted dosing. The percentage of time within the INR range was 64.7% with manual dosing and 65.9% with computer-assisted dosing. The total cost per patient was EUR 222.60 with manual dosing and EUR 172.10 with computer-assisted dosing; a cost saving of EUR 50.50 with computer-assisted dosing.

Computer-assisted dosing was cheaper and more effective than manual dosing and so incremental cost-effectiveness ratios were not calculated.

The results were robust to variations in the key parameters. For example, the mean difference in costs was EUR 50 for atrial fibrillation patients and EUR 56 in mechanical heart valve patients.

Authors' conclusions
The authors concluded that these computer-assisted dosing programs were equally clinically effective and they were cost saving, compared with manual dosing, which indicated that they were cost-effective.

CRD commentary
Interventions:
The authors compared two computer-assisted dosing programs with manual dosing, which was likely to have been the usual practice and should be applicable to other settings. The intervention procedures were described.

Effectiveness/benefits:
The effectiveness data were from a large randomised controlled trial, with a good design, and the data appear to have been appropriate. The study had a long follow-up period, which should have been sufficient to capture the relevant dosing-related adverse events that were the primary outcome.

Costs:
The authors reported the study perspective and a detailed breakdown of the cost categories. A good description of the method of costing was given and the price year was stated, which will allow the costs to be revalued in the future. The costs included were appropriate for the perspective and the estimates appeared to be relevant to the population and setting.

Analysis and results:
The analytical approach was well reported and appropriate. The authors presented an incremental analysis, but did not calculate a ratio because the intervention was less costly and more effective. The results were reported clearly and in full. Appropriate one-way sensitivity analyses were performed, but multivariate and probabilistic analyses would have more thoroughly assessed the parameter uncertainty. The authors discussed the strengths and limitations of the analysis.

Concluding remarks:
The methods were good and were well reported, as were the results. The results seem to be reliable and the conclusions appear to be appropriate.

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