The cost comparison of rhythm and rate control strategies in persistent atrial fibrillation

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.

Health technology
The authors compared sinus rhythm (SR) restoration and maintenance against ventricular rate control supported by thromboembolic prophylaxis in persistent atrial fibrillation (AF).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients with the first clinically overt persistent episode of AF. Patients were eligible if they were no older than 75 years of age, with AF known to be present for no longer than 2 years. Detailed inclusion and exclusion criteria were not presented in this paper, but were stated to have been reported in the parent publications (Opolski et al. 2004 and Kosior et al. 2005, see 'Other Publications of Related Interest' below for bibliographic details).

Setting
The setting was inpatient care. The economic study was carried out in Poland.

Dates to which data relate
The effectiveness data related to a single study, details of which were published in 2004 and 2005. Resource use related to the period of the clinical study. The costs were reported in 2002 prices.

Link between effectiveness and cost data
The costing was carried out prospectively on the same sample of patients as that used in the effectiveness study.

Study sample
The study sample comprised 205 patients (134 male, average age 60.8 +/- 11.2 years) with non-valvular persistent AF who were eligible for the study. A total of 101 patients were allocated to rate control and 104 to rhythm control.

Study design
The analysis was based on the 'How to Treat Chronic Atrial Fibrillation' trial. This was an open, randomised, multi-centre study, details of which were reported elsewhere (Opolski et al. 2004). The exact number of centres involved was not reported in the current paper and the reader is referred to the parent study for further details. The patients were followed for 12 months.
Analysis of effectiveness
The groups were extensively compared in terms of their demographic and clinical factors at baseline and no significant differences were observed (p<0.05 considered statistically significant). The authors reported that there was no loss to follow-up due to being lost from observation. One patient in the rate control group and one in the rhythm control group were lost to follow-up because of death. One patient in the rhythm control group withdrew their consent after 6 months. The analysis was carried out according to intention to treat principles.

Effectiveness results
The authors reported that all the study participants assigned to the rate control arm presented with AF at 1 year of follow-up. They reported that 66 patients (63.5%) in the rhythm control group demonstrated SR at the end of the study.

Clinical conclusions
Within their discussion the authors noted that rhythm and rate control management strategies offered "comparable clinical benefits".

Measure of benefits used in the economic analysis
The authors did not estimate a summary measure of health benefit. Therefore, given the comparable effectiveness results the focus of the analysis was the costs.

Direct costs
The costing was carried out from the perspective of the health care payer. It focused on cardioversion, hospitalisations non-related to cardioversion, outpatient visits and medications. The unit costs were taken from the National Health Care Fund (and encompassed aspects such as hospital stay, drugs, labour costs and supplies used for cardioversion), the hospital’s cost-accounting system, and retail prices. The costs were not discounted because of the relatively short time horizon. The costs were reported in 2002 prices.

Statistical analysis of costs
The data were summarised as means +/- the standard deviation, or as numbers and percentages. Continuous variables were tested using an analysis of variance for between-group comparisons, while mean values were compared using Student’s t-test. Bootstrapping was used to account for the skewed nature of the distribution of the costs.

Indirect Costs
Productivity costs were not relevant to the perspective adopted.

Currency
Polish zlotych (PLN) converted into euros (EUR).

Sensitivity analysis
There was no report of a sensitivity analysis having been carried out.

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The total annual cost was EUR 1,225 for rate control and EUR 2,526 for rhythm control. The difference was
statistically significant.

**Synthesis of costs and benefits**
A synthesis of the costs and benefits was not relevant to this study.

**Authors' conclusions**
"The findings of the economic appraisal supported the rate control strategy as less costly."

**CRD COMMENTARY - Selection of comparators**
The authors compared SR restoration and maintenance against ventricular rate control supported by thromboembolic prophylaxis. Although a useful discussion of relative merits was given, it was unclear whether these were the only treatment alternatives available, or whether they were the most commonly used in the authors' setting. The reader should assess whether these are valid comparators in their own setting.

**Validity of estimate of measure of effectiveness**
The authors used a published, open, randomised, multi-centre study to provide their effectiveness estimates. Such a design aims to minimise systematic differences between patients in the two study groups, thus increasing the validity of the results. The study sample included patients who met the eligibility criteria for the study, and so was representative of the study population. Randomisation contributed to ensuring that there were no observed statistically significant differences between the patient groups at baseline. For a full appraisal of the validity of the effectiveness data, the reader will need to refer to the parent clinical papers.

**Validity of estimate of measure of benefit**
A summary measure of health benefit was not estimated. The reader is referred to the comments in the 'Validity of estimate of measure of effectiveness' field (above).

**Validity of estimate of costs**
The costing was carried out from the perspective of a third-party payer. Unit costs relevant to this perspective were included in the analysis. The authors clearly indicated the costs included and detailed the sources of the estimates. A price year was reported to enable the reader to gain a greater understanding of the context. In presenting the results the authors gave a useful breakdown of the total costs that will enable readers to interpret the main cost-drivers themselves. Given the statistically significant difference between cost estimates in the two study groups, it is unlikely that small changes in cost due to omissions, changes in the setting, or perspective, would alter the principle conclusions drawn.

**Other issues**
The authors reported that the results of the HOT CAFE trial (Opolski et al. 2004) supported the results of other published studies relating to the two technologies of interest in terms of their effectiveness. A detailed comparison of the components of the economic analysis was made with other studies. The authors noted, as a potential limitation of the study, the difficulty in generalising the results because of differences in the costs of resources, incompatibility of drug reimbursement schemes, and practice patterns. The results were clearly presented and easy to interpret, and the conclusions accurately reflected the results presented.

**Implications of the study**
The authors did not note any implications for policy or practice resulting from their study, although they did note the usefulness of future meta-analyses of randomised trials in informing treatment decisions.
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Other publications of related interest
Because readers are likely to encounter and assess individual publications, NHS EED abstracts reflect the original publication as it is written, as a stand-alone paper. Where NHS EED abstractors are able to identify positively that a publication is significantly linked to or informed by other publications, these will be referenced in the text of the abstract and their bibliographic details recorded here for information.


Indexing Status
Subject indexing assigned by NLM

MeSH
Analysis of Variance; Anti-Arrhythmia Agents /economics; Atrial Fibrillation /economics /therapy; Chronic Disease; Cost-Benefit Analysis; Costs and Cost Analysis; Diagnostic Imaging /economics; Electric Countershock /economics; Electrocardiography /economics; Female; Humans; Length of Stay /economics; Male; Middle Aged; Pacemaker, Artificial /economics; Poland; Prospective Studies

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