Implantable loop recorders are cost-effective when used to investigate transient loss of consciousness which is either suspected to be arrhythmic or remains unexplained

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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 study assessed the cost-effectiveness of implantable loop recorders (implantable loop recorders) to monitor people with transient loss of consciousness. The authors concluded that implantable loop recorder monitoring was likely to be a cost-effective strategy. The quality of the study methodology was adequate, with appropriate reporting of methods and results; it appears that the authors’ conclusions are appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The study assessed the cost-effectiveness of implantable loop recorders in people with transient loss of consciousness.

Interventions
Implantable loop recorder monitoring was compared with no further testing in people with infrequent transient loss of consciousness episodes, which were unexplained or suspected to be arrhythmic in origin. A secondary analysis compared implantable loop recorder monitoring with conventional testing.

Location/setting
UK/In-patient secondary care.

Methods
Analytical approach:
A decision tree was used to estimate the diagnostic outcomes and costs from each strategy. The time horizon was 10 years in the base case. The authors reported that the perspective adopted was that of the UK NHS and personal social services.

Effectiveness data:
Clinical and effectiveness data came from previously published studies and the authors’ own assumptions. The main measure of effectiveness used in the model was the diagnostic yield. The outcomes extracted included: transient loss of consciousness with electrocardiogram (ECG) showing normal rate and rhythm during loss of consciousness; transient loss of consciousness with ECG showing arrhythmia during loss of consciousness; transient loss of consciousness with no ECG recorded during loss of consciousness; arrhythmia recorded in the absence of transient loss of consciousness; and no transient loss of consciousness during implantable loop recorder monitoring and no asymptomatic arrhythmia recorded. These estimates came from a systematic review of the literature, conducted as part of UK National Institute for Health and Clinical Excellence (NICE) guidelines (Westby, et al. 2010, see ‘Other Publications of Related Interest' below for bibliographic details).

Monetary benefit and utility valuations:
The authors reported that health-related quality of life estimates were from a targeted review of studies in people with transient loss of consciousness. Only preference-based utility measures were included in the review.

Measure of benefit:
The measure of benefit used was quality-adjusted life-years (QALYs) gained. Future benefits were discounted using an
annual rate of 3.5%.

Cost data:
The direct costs included were those for implantable loop recorder monitoring (including implantation, removal and device acquisition); pacing (including implantation, device acquisition, and annual follow-up); and recurrences (including ambulance, emergency visit, and hospital admission). Device costs came from published estimates. All other costs were from NHS reference costs. All costs were updated to 2008 prices using the Hospital and Community Services Pay and Prices Index. Future costs were discounted using an annual rate of 3.5% and were reported in UK £.

Analysis of uncertainty:
Univariate sensitivity analyses were conducted to test the impact of assumptions on the model results. A probabilistic sensitivity analysis was also undertaken to assess the variation in results arising from uncertainty surrounding the precision of the model inputs.

Results
The QALYs gained when implantable loop recorder monitoring was compared with no testing were 0.394 for suspected arrhythmia patients, and 0.366 for patients with unexplained transient loss of consciousness; when implantable loop recorder monitoring was compared with conventional testing, the QALYS gained were 0.181.

The average cost per patient when implantable loop recorder monitoring was compared with no testing was £6,460 for suspected arrhythmia patients and £6,380 for patients with unexplained transient loss of consciousness; when implantable loop recorder monitoring was compared with conventional testing, the cost was £4,220.

Costs and outcomes were combined using an incremental cost-utility ratio (the additional cost per QALY gained). When compared with no testing, implantable loop recorder monitoring was associated with an incremental cost-utility ratio of £16,390 for suspected arrhythmia patients and £17,450 for patients with unexplained transient loss of consciousness; when compared with conventional testing, the incremental cost-utility ratio was £23,360.

Results of the probabilistic sensitivity analysis showed that the probability of implantable loop recorder monitoring being cost-effective when compared with no testing at a willingness to pay threshold of £20,000 per QALY was 88% for unexplained loss of consciousness and 94% for suspected arrhythmic loss of consciousness.

Authors' conclusions
The authors concluded that implantable loop recorder monitoring was likely to be a cost-effective strategy.

CRD commentary
Interventions:
The interventions under study were reported adequately. Conventional testing was included as a comparator.

Effectiveness/benefits:
Clinical and effectiveness data came from previously published studies and the authors’ own assumptions. The main measures of effectiveness used in the model were from studies identified in a systematic review. Although no details of the systematic review were reported in the study, the bibliographic details were given. As the review was conducted as part of a NICE guideline, it was likely that all relevant effectiveness estimates were included in the review.

Utility estimates were obtained for the relevant health states, but the type of utility instrument used and method of data selection were not reported (the relevant publication was referenced). A time horizon of 10 years seemed reasonable to capture the intervention outcomes.

Costs:
The perspective adopted was reported to be that of the UK NHS and social service. It appeared that all major cost categories and costs were included. The sources for the costs were adequately reported. The price year and currency details were reported.

Analysis and results:
A decision tree was used to synthesise cost and outcome information. Appropriate details of the model structure were provided including a diagram. Uncertainty was adequately tested using one-way and probabilistic sensitivity analyses on the results. As main limitation to their study, the authors acknowledged that there was considerable uncertainty in survival following pacing.

Concluding remarks:
The quality of the study methodology was adequate, with appropriate reporting of methods and results. It appears that the authors’ conclusions are appropriate.

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Bibliographic details
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Other publications of related interest

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