

Executive summary

**Implantable cardioverter
defibrillators: arrhythmias.
A rapid and systematic review**

J Parkes*

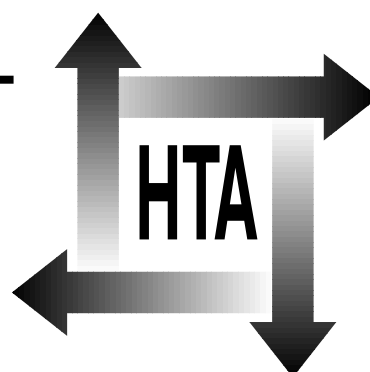
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**Health Technology Assessment
NHS R&D HTA Programme**





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Proposed service

The service proposed is the use of implantable cardioverter defibrillators (ICDs) in the management of risk factors leading to sudden cardiac death (SCD). ICDs are similar in size to a pacemaker and are intended to prevent death due to life-threatening ventricular tachyarrhythmias.

Epidemiology and background

SCD occurs in approximately 100,000 people annually in the UK and is usually due to ventricular tachyarrhythmia. Increasing numbers of people are surviving a first episode of ventricular tachyarrhythmia and are at high risk of further episodes. Standard treatments for those at high risk have been anti-arrhythmic drugs, catheter ablation or surgery and, increasingly, vasodilating beta-blockers.

Methods

Electronic databases were searched for the period 1980–99. In addition, bibliographies of related papers were assessed for relevant studies, and experts were contacted to identify additional published and unpublished references.

Studies were included if they were systematic reviews, meta-analyses or randomised controlled trials (RCTs) comparing ICDs with conventional therapy in people at high risk of SCD.

Number and quality of studies and direction of evidence

Seven RCTs on effectiveness the majority of which were of good quality, eight cost-effectiveness analyses most of which were older studies and based on non-UK data, and two good-quality literature reviews one of which was a critical appraisal of the literature of effectiveness and cost-effectiveness of ICD therapy, and the other

a review of the cost-effectiveness of ICD therapy. These showed changes in absolute risk of total mortality ranging from an increase of 1.7% to a reduction of 22.8% (relative risk reductions of -7% to +54%).

Summary of benefits

Estimated benefits from RCT data are 0.23–0.8 additional years of life with ICD therapy compared with anti-arrhythmic drug therapy.

Costs

Unit cost of ICDs (based on 1999/2000 prices), ranges from £12,500 to £22,000. Total discounted costs for 3 years range from £20,000 to £29,000.

Cost-effectiveness

Cost-effectiveness estimates in the literature identified range from \$11,000 to \$146,000 per life-year saved. Using UK cost data from three hospitals and trial survival data from one RCT, the estimate of cost-effectiveness from this review ranges between £20,250 and £87,000 per life-year saved.

Cost-utility

Cost per quality-adjusted life-year is estimated by the authors of this review at £21,300 to £108,800 (using survival data from one trial and quality-of-life indices derived from clinical opinion). These figures remain speculative until quality-of-life data from ongoing trials are available to inform future UK cost-effectiveness/utility analyses.

Implications

If implemented for indications supported by evidence from RCTs, ICDs may cost the NHS in excess of £24 million per annum.

Future research

Future research should include the use of British Pacing and Electrophysiological Group registries to assess the use of different types of ICD and current service provision.

Publication

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NHS R&D HTA Programme

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The research reported in this monograph was commissioned by the HTA programme (project number 00/07/01) on behalf of the National Institute for Clinical Excellence (NICE). Rapid reviews are completed in a limited time to inform the appraisal and guideline development processes managed by NICE. The review brings together evidence on key aspects of the use of the technology concerned. However, appraisals and guidelines produced by NICE are informed by a wide range of sources. Any views expressed in this rapid review are therefore those of the authors and not necessarily those of the HTA programme, NICE or the Department of Health.

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