Cost-effectiveness analysis of the bone-anchored hearing device
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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 of the study was to assess the cost-effectiveness of a bone-anchored hearing device. The authors concluded that the bone-anchored hearing device was likely to be cost-effective at the threshold used by the National Institute for Health and Clinical Excellence, UK. The study was well done and the authors' conclusions appear appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
To assess the cost-effectiveness of a bone-anchored hearing device.

Interventions
The bone-anchored hearing device was compared to standard care that included a digital behind-the-ear hearing aid.

Location/setting
Birmingham, England/Hospital.

Methods
Analytical approach:
The analysis was an economic evaluation carried out alongside a single clinical study. A lifetime horizon was used and the authors reported that a health care perspective was adopted.

Effectiveness data:
The clinical and effectiveness data were from a before-and-after analysis. One hundred and forty-seven adult patients who were offered a bone-anchored hearing device in one city were sent a questionnaire prior to implantation of the device and 89 questionnaires were returned. Patients were sent a second questionnaire following implantation of the device and 70 of these were completed. The main measure of effectiveness was the health utility score.

Monetary benefit and utility valuations:
Utility values were obtained from the patients included in the clinical study and were derived using the Health Utility Index (HUI) questionnaire Mark 2 and Mark 3. These were used in preference to EQ-5D due to their hearing domain: Mark 2 combined hearing with vision and speech and Mark 3 evaluated hearing separately.

Measure of benefit:
The measure of benefit was the quality-adjusted life-year (QALY) discounted at an annual rate of 3.5%.

Cost data:
The economic analysis included costs of surgery, the bone-anchored hearing device and its subsequent maintenance. Resource use data were derived from patient records. Cost data were obtained from the hospital that provided the treatment. The price year was 2008. Costs were discounted at an annual rate of 3.5%.

Analysis of uncertainty:
Nonparametric bootstrapping was used to examine uncertainty in model outputs. Cost-effectiveness acceptability curves were generated for various willingness-to-pay thresholds. One-way sensitivity analysis was carried out on the discount
Results
Mean QALYs gained associated with the implant was 1.17. The additional cost associated with the bone-anchored hearing device was £20,604.

The additional cost per QALY gained with the bone-anchored hearing device compared to usual care was £17,610. The likelihood of the bone-anchored hearing device being cost-effective was 56% at a willingness-to-pay of £20,000 and 69% at a willingness-to-pay of £30,000.

Authors' conclusions
The authors concluded that the bone-anchored hearing device was likely to be cost-effective at the threshold used by the National Institute for Health and Clinical Excellence, UK.

CRD commentary
Interventions: The intervention and comparator were relatively well described and typical practice for the setting was included as a comparator.

Effectiveness/benefits: Effectiveness data were derived from a before-and-after study where all patients had been using a hearing aid and all were then given the bone-anchored hearing device. Although that study design was prone to bias from confounding factors, the authors pointed out that the nature of the intervention meant that patient outcomes were unlikely to change had they stayed on the hearing aid. The authors suggested that self-selection of patients was more of an issue.

Details on the method used to derive the utility values was reported and seemed appropriate. The authors adequately justified their choice of the Health Utility Index utility instrument.

Costs: The authors reported that a health care perspective was adopted and costs related to that perspective were included. The sources of costs and resource use data were appropriate for the setting. However, costs were presented as category totals and this reduced the transparency of the analysis. Other details such as the price year and discounting were reported.

Analysis and results: Costs and outcomes associated with the intervention and comparator were combined appropriately using an incremental approach. An appropriate analysis of uncertainty was conducted. The authors discussed some limitations to their analysis that included the before-and-after study design.

Concluding remarks: The study was well done and the authors’ conclusions appear appropriate.

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