Cost-effectiveness of contralateral prophylactic mastectomy versus routine surveillance in patients with unilateral breast cancer
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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 was to evaluate the cost-effectiveness of contralateral prophylactic mastectomy versus routine surveillance in patients with unilateral breast cancer. The authors concluded that contralateral mastectomy was cost-effective, compared with surveillance, for patients younger than 70 years. The methods were adequate and the results clearly reported. The authors’ conclusions appear to be appropriate, but some uncertainty remains.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to evaluate the cost-effectiveness of contralateral prophylactic mastectomy versus routine surveillance for patients with unilateral breast cancer.

Interventions
The authors assessed two contralateral breast cancer risk management strategies for patients with early stage, node-negative, unilateral breast cancer. These were unilateral mastectomy followed by surveillance, which was the standard care, or unilateral mastectomy followed by contralateral mastectomy.

Location/setting
USA/in-patient secondary care.

Methods
Analytical approach:
The authors developed a Markov model to simulate the paths of patients with breast cancer from mastectomy to death. The model had six health states (disease free, contralateral breast cancer, recurrent cancer, metastatic cancer, death from cancer, and death from other causes). Annual transitions between these states were modelled. The authors stated that perspective was that of the health care provider.

Effectiveness data:
The clinical and effectiveness data were from published studies and national databases. The main parameters were the transition probabilities to contralateral breast cancer. These estimates were from published studies.

Monetary benefit and utility valuations:
The utility estimates were from a published study (Stout, et al. 2006, see 'Other Publications of Related Interest' below for bibliographic details).

Measure of benefit:
The measure of benefit was quality-adjusted life-years.

Cost data:
The direct costs were those of in-patient and out-patient hospital care, these included physician visits, diagnostic tests and scans, chemotherapy and radiotherapy, mastectomy (bilateral or unilateral), death from disease, and death from other causes. Except for death, the costs were from either the Nationwide Inpatient Sample database or Medicare.
reimbursement rates. The price year was 2007 and all costs were in US dollars ($).

Analysis of uncertainty:
One-way sensitivity analyses were performed by varying the risk of metastasis, the exclusion of death costs, the risk of breast cancer, and the utility weights.

Results
The average cost per patient, for contralateral mastectomy, ranged from $36,594 for 45-year-old women to $41,843 for 75-year-old women. For surveillance, it ranged from $35,182 for 45-year-old women to $39,041 for 75-year-old women.

The average QALYs gained, for contralateral mastectomy, ranged from 6.84 for 75-year-old women to 21.22 to 45-year-old women. For surveillance, they ranged from 6.81 for 75-year-old women to 20.93 for 45-year-old women.

Compared with surveillance the incremental cost-utility ratio (incremental cost per QALY gained) for contralateral mastectomy was $4,869 for 45-year-old women, $6,896 for 50-year-old women, $9,237 for 55-year-old women, $17,333 for 60-year-old women, $28,213 for 65-year-old women, $62,750 for 70-year-old women, and $93,400 for 75-year-old women.

These results were most sensitive to breast cancer gene (BRCA) mutation status (risk of breast cancer) and the quality of life estimates.

Authors' conclusions
The authors concluded that contralateral prophylactic mastectomy was cost-effective, compared with surveillance, for patients with breast cancer who were younger than 70 years. Its cost-effectiveness depended on the patient's preference for treatment.

CRD commentary
Interventions:
The interventions were reported adequately.

Effectiveness/benefits:
The authors stated that the clinical and effectiveness data were from published sources and national databases. They did not report if a systematic review of the literature was undertaken to identify these data, making it impossible to determine if all the relevant data were analysed. This could affect the results. The time horizon was the lifetime of the patient and discounting of future benefits was relevant, but it was unclear if it was conducted. Discounting could alter the QALY results and the subsequent incremental ratios.

Costs:
The perspective was explicitly reported to be that of the health care provider. All the major costs relevant to this perspective appear to have been analysed. The authors adequately reported the sources for these costs, as well as the price year, time horizon, discount rate, and currency.

Analysis and results:
The cost and effectiveness information were synthesised, using a decision-analytic Markov model. Appropriate details of the model structure and a diagram were provided. Uncertainty in the model was assessed in a limited one-way sensitivity analysis. This type of analysis goes some way in evaluating uncertainty, but a probabilistic sensitivity analysis would have been a better way to capture the overall model uncertainty. As main limitation to their analysis, the authors reported that their model was partly dependent on the data and simplifying assumptions.

Concluding remarks:
The methods were adequate and the results were sufficiently reported, but the details of how the clinical and effectiveness data were obtained were not reported. Within the scope of the analysis, the authors' conclusions appear to be appropriate.
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Other publications of related interest

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