Cost-effectiveness analysis of treatment strategies for Stage I and II endometrial cancer

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 study compared two treatment strategies for the management of endometrial cancer. The first strategy was hysterectomy with bilateral salpingo-oophorectomy (HBSO) as the surgical procedure, which was followed, in some instances, by pelvic radiotherapy (RT) depending on the final grade of endometrial cancer after HBSO. The second strategy began with surgical staging, involving HBSO and pelvic lymph node dissection with possible para-aortic node dissection, cytology and omental and peritoneal biopsies, which again was followed by specific indicators for RT depending on the final grade of endometrial cancer after staging.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis

Study population
The study population comprised a cohort of women, aged 63 years, with endometrial cancer.

Setting
The setting for the study appears to have been both outpatient and inpatient care. The economic analysis was carried out in Canada.

Dates to which data relate
The effectiveness and resource use data were collected between 1996 and 2005. The price year was 2003/04.

Modelling
A decision analytic model was developed. The time horizon was not explicitly stated in the model, but a 5-year follow-up period for health outcomes and lifetime costs was used. The values of model variables were presented in the paper, along with a number of modelling assumptions for which the authors provided justification.

Study designs and other criteria for inclusion in the review
The clinical data used in the economic evaluation were the 5-year overall survival for the different stages of endometrial cancer.

Sources searched to identify primary studies
The clinical data were obtained from a province-wide population-based study (Kwon et al. 2004, see 'Other Publications of Related Interest' below for bibliographic details).

Methods used to derive estimates of effectiveness
The methods used to obtain the data were not reported.

Measure of benefits used in the economic analysis
The measure of benefit used was the quality-adjusted life-years (QALYs). Quality of life weights were based on those reported for local and regional gynaecologic cancer, as well as those extrapolated from adjuvant pelvic RT of bowel, prostate and testicular cancer. The benefits were discounted at an annual rate of 3%.
Direct costs
The direct costs to the health system were included in the analysis. These included physician services, radiation treatment, inpatient hospitalisation and outpatient cancer centre facilities. The data on physician services were obtained from the Ontario Schedule of Benefits for Physician Services under the Health Insurance Act. Inpatient hospitalisation and outpatient cancer centre costs were obtained from data on acute inpatient and day surgery from the Ontario Case Costing initiative. A combination of micro-costing and gross costing was used to value resources. The unit costs were reported, but the resource quantities were not. The costs were discounted at an annual rate of 3%.

Statistical analysis of costs
No statistical analysis of the costs was conducted.

Indirect Costs
The productivity costs included in the analysis were the patient time costs associated with surgery and RT. The costs were based on the estimated total time allocated to treatment and the minimum wage in Ontario in the year 2004. The unit costs and the quantities were reported separately. The costs were discounted at a rate of 3% per year.

Currency
Canadian dollars (CAD).

Sensitivity analysis
Parameter uncertainty was investigated through one-way sensitivity analysis, including estimated costs and utilities. All parameters were assigned prior distribution probabilities, details of which were provided in the paper.

Estimated benefits used in the economic analysis
For a preoperative diagnosis of Grade 1 endometrial cancer, the average QALYs gained were 9.297 for the HBSO strategy and 9.260 for the surgical staging strategy.

For a preoperative diagnosis of Grade 2 endometrial cancer, the average QALYs gained were 8.9003 for the HBSO strategy and 8.9631 for the surgical staging strategy.

For a preoperative diagnosis of Grade 3 endometrial cancer, the average QALYs gained were 8.178 for the HBSO strategy and 8.084 for the surgical staging strategy.

Cost results
For a preoperative diagnosis of Grade 1 endometrial cancer, the average lifetime cost was CAD 8,307 for the HBSO strategy and CAD 8,900 for the surgical staging strategy.

For a preoperative diagnosis of Grade 2 endometrial cancer, the average lifetime cost was CAD 8,918 for the HBSO strategy and CAD 9,245 for the surgical staging strategy.

For a preoperative diagnosis of Grade 3 endometrial cancer, the average lifetime cost was CAD 9,914 for the HBSO strategy and CAD 10,046 for the surgical staging strategy.

Synthesis of costs and benefits
The costs and benefits were combined using an incremental cost-effectiveness ratio (ICER).

For Grade 1 endometrial cancer, HBSO dominated surgical staging (was less costly and more effective).

For Grade 2 endometrial cancer, neither strategy was dominant. Surgical staging had an incremental cost-effectiveness ratio of CAD 5,216 per QALY gained.

For Grade 3 endometrial cancer, surgical staging strongly dominated HBSO.

The sensitivity analysis showed that these results were generally stable over a wide range of estimates of costs and utilities. The one exception to this was varying the utility for pelvic RT, which had an influence on treatment...
recommendations for patients with Grade 1 cancer only.

If the utility for pelvic RT was between 0.50 and 0.70 (base-case utility -0.90), the ICER for surgical staging compared with HBSO was less than CAD 50,000 per QALY. However, when the utility for pelvic RT was greater than 0.70, HBSO dominated surgical staging.

**Authors' conclusions**
The authors concluded that the most cost-effective treatment strategies for early endometrial cancer in Ontario differed according to preoperative grade.

**CRD COMMENTARY - Selection of comparators**
The justification for the choice of the comparator was clear. It represented current practice in the authors' setting. You should decide if this represents a valid comparator in your own setting.

**Validity of estimate of measure of effectiveness**
The parameters were derived from published sources. As the clinical data were taken from one population-based study there does not seem to have been any synthesis of the data. The authors did not report any search methods or inclusion criteria, nor did they provide any justification for their selection of estimates. The clinical data were derived from a population-based study, but it is not possible to judge the validity of the data given the information reported in the paper (Kwon et al. 2004).

**Validity of estimate of measure of benefit**
The estimation of health benefit (QALYs) was derived appropriately using a decision analytic model. The QALYs were appropriately discounted. The authors reported that the stage-specific utilities required for the model were not available, so reported utilities for local and regional gynaecologic cancer and pelvic RT of bowel, prostate and testicular cancer were used instead. It was not clear if any difference in utilities would have been observed had stage-specific utilities been available, although the authors acknowledged this.

**Validity of estimate of costs**
The analysis of the costs was performed from a societal perspective and it appears that all the relevant categories of costs have been included in the analysis. Details of sources were well reported and unit costs were presented. Some information on resource use would have been useful, but this was not given. The costs were appropriately discounted given that they were incurred over several years.

**Other issues**
The authors compared their findings with the very limited number of studies that had been completed in the area. The issue of generalisability was addressed through an extensive sensitivity analysis of the clinical parameters, utilities and costs used in the analysis. The authors do not appear to have shown their results selectively. The study was concerned with treatment strategies for early endometrial cancer and this was reflected in the authors' conclusions. The authors noted some major limitations to their analysis, e.g. the lack of data on stage-specific quality of life associated with endometrial cancer.

**Implications of the study**
The authors suggest that a reasonable policy would be to offer HBSO to those with a preoperative diagnosis of Grade 1 cancer, and either HBSO or surgical staging to those with a preoperative diagnosis of Grade 2 cancer, and surgical staging to those with a Grade 3 preoperative diagnosis.

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**Bibliographic details**
PubMedID
17346483

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.


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