Cost-effectiveness analysis of prevention strategies for gynecologic cancers in Lynch syndrome

Kwon JS, Sun CC, Peterson SK, White KG, Daniels MS, Boyd-Rogers SG, Lu KH

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 assess the costs and outcomes associated with five gynaecologic cancer prevention strategies in a cohort of women with Lynch syndrome. Annual screening followed by prophylactic surgery at age 40 years was the most effective strategy, but its incremental benefit over prophylactic surgery alone was obtained at a substantial cost. There were a few limitations to the reporting, but the methods used appear to have been robust and the authors’ conclusions seem to be appropriate.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the costs and outcomes associated with five gynaecologic cancer prevention strategies in a cohort of women with Lynch syndrome.

Interventions
The five strategies were: no prevention; prophylactic surgery at age 30 years; prophylactic surgery at age 40 years; annual screening from age 30 years with endometrial biopsy and transvaginal ultrasound; and annual screening from age 30 years until prophylactic surgery at age 40 years. Prophylactic surgery was hysterectomy and bilateral salpingo-oophorectomy.

Location/setting
USA/the setting was not reported.

Methods
Analytical approach:
A Markov model was used to model the ongoing risk of endometrial and ovarian cancer and the associated costs and health states over time. A lifetime horizon was used and the authors stated that a societal perspective was adopted.

Effectiveness data:
The effectiveness data were derived from published studies. The key clinical parameter was the risk of developing endometrial and ovarian cancer.

Monetary benefit and utility valuations:
Quality-of-life weights were derived from published studies.

Measure of benefit:
The primary measure of benefit was the quality-adjusted life-year (QALY). These were discounted at an annual rate of 3%.

Cost data:
The direct costs included those of screening and surgery and the indirect costs included those of the patient's travel and time. The screening costs were obtained from the Medicare payment schedule of the US Department of Health and Human Services. The surgery costs were obtained from the Health Care Utilization Project (US Department of Health
and Human Services). Time costs were calculated according to the Bureau of Labor Statistics (US Department of Labor). The price year was not reported. The costs were discounted at an annual rate of 3% and were reported in US dollars ($).

Analysis of uncertainty:
Univariate and probabilistic sensitivity analyses were conducted to account for the uncertainty in the model parameters.

Results
Compared with no prevention, prophylactic surgery at 30 years had an incremental cost-effectiveness ratio (ICER) of $13,877.
Compared with prophylactic surgery at 30 years, prophylactic surgery at 40 years had an ICER of $5,025.
Compared with prophylactic surgery at 40 years, the annual screening strategy with biopsy and transvaginal ultrasound until surgery at 40 years had an ICER of $194,650.
Compared with a strategy of screening until surgery at 40 years, annual screening alone was dominated, which means it was more costly and less effective.

These results were sensitive to the quality weight attached to prophylactic surgery.

Authors' conclusions
The authors concluded that annual screening followed by prophylactic surgery at age 40 years was the most effective gynaecologic cancer prevention strategy, but the incremental benefit over prophylactic surgery alone was obtained at a substantial cost.

CRD commentary
Interventions:
The interventions were clearly reported and were appropriate strategies in the authors' setting.

Effectiveness/benefits:
The effectiveness evidence was obtained from a number of published studies, but no details of the methods of a literature review or of the designs of the chosen studies were reported, which makes it difficult to assess whether the best available evidence was used. The reporting of the effectiveness estimates was clear. The use of QALYs as the main measure of benefit was appropriate and details of their derivation were provided.

Costs:
The costs appeared to reflect the perspective stated. Both the direct and indirect costs were obtained from relevant sources for the study population. In general, the reporting of the cost data was satisfactory with the details of some of the unit costs and the ranges used in the sensitivity analysis. Discounting was appropriately performed.

Analysis and results:
The authors conducted an appropriate incremental analysis and the full results were presented. The results of the sensitivity analyses were presented and discussed. As the cost data related to a US perspective, the results of the analysis might not be generalisable to other settings, but this was partly addressed by the inclusion of the cost estimates in the sensitivity analyses.

Concluding remarks:
There were a few limitations to the reporting, but the methods used appear to have been robust and the authors' conclusions seem to be appropriate.

Funding
Not stated.

Bibliographic details
Kwon JS, Sun CC, Peterson SK, White KG, Daniels MS, Boyd-Rogers SG, Lu KH. Cost-effectiveness analysis of

**PubMedID**
18506736

**DOI**
10.1002/cncr.23554

**Original Paper URL**
http://onlinelibrary.wiley.com/cgi-bin/fulltext/119427630/PDFSTART

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Adult; Colorectal Neoplasms, Hereditary Nonpolyposis /economics; Cost-Benefit Analysis; Female; Genital Neoplasms, Female /economics /prevention & control; Humans; Middle Aged; Monte Carlo Method; Ovarian Neoplasms /economics /prevention & control; Risk Factors

**AccessionNumber**
22008101547

**Date bibliographic record published**
09/09/2009

**Date abstract record published**
09/12/2009