Systematic review and cost-effectiveness analysis of elective endovascular repair compared to open surgical repair of abdominal aortic aneurysms - interim report

Record Status
This is a bibliographic record of a published health technology assessment from a member of INAHTA. No evaluation of the quality of this assessment has been made for the HTA database.

Citation

Authors' objectives
The purpose of this project was fourfold. First, to provide an updated evaluation of the scientific literature related to endovascular repair (EVAR) for abdominal aortic aneurysms (AAA). Second, to collect Ontario-specific clinical, resource utilization and quality-of-life data related to the use of EVAR and open surgical repair (OSR). Third, to develop a cost-effectiveness model incorporating data from both the clinical literature and the field evaluation study. And finally, to evaluate the cost-effectiveness of endovascular repair compared to open surgical repair for the management of non-ruptured AAA in Ontario.

The purpose of this interim report is to present the results of our systematic literature review and an interim analysis to OHTAC to estimate the cost-effectiveness of EVAR versus OSR based on 1) an updated review of the literature; 2) a preliminary analysis of a subset of patients with 1 year follow-up recruited into the London Health Science Centre (LHSC) study; and 3) a decision analytic model developed to evaluate the cost-effectiveness of EVAR versus OSR.

Authors' conclusions
Several limitations associated with this interim analysis need to be considered when interpreting the results of this evaluation and a few important cautionary notes are warranted that may significantly affect these interim results and conclusions.

First, these interim results are based on a deterministic, as opposed to probabilistic, cost-effectiveness model. The standard today for conducting cost-effectiveness analyses of models is to represent parameter uncertainty using probability distributions and to use simulation techniques to sample from these distributions to derive at cost-effectiveness estimates. By structuring the decision problem in this way, the full range of uncertainty in model parameters and the impact of joint uncertainty are built into the base case analysis. Variability assumptions (e.g. different patient cohorts or modeling assumptions) are then tested using sensitivity analysis on the probabilistic model. These interim results are based on a deterministic cost-effectiveness model and the final model (due 2006) will be a fully probabilistic model.

Second, not included in this report is an extensive sensitivity analysis around the base case deterministic cost-effectiveness estimates to fully explore the impact of uncertainty on our results. There are two reasons for this. First, the final model will be a probabilistic model that incorporates parameter uncertainty and as a result extensive sensitivity analyses around these parameters are not needed. And second, it was felt there were too few patients and too much uncertainty around our results for the patients included in our interim analysis to conduct extensive sensitivity analyses. We have conducted what we feel, based on the results to date, is the most important sensitivity analysis. Namely, we have explored the impact on the cost-effectiveness results of using the rate and cost of complications from LHSC.

Finally, there is concern over the comparability of EVAR and OSR patients available from the systematic literature review. The comparison of EVAR versus OSR has been studied using a randomized trial design in 4 unique studies. All other study reports are non-randomized and compare EVAR with either concurrent or historical OSR comparison.
groups. The OSR patients used as a comparison to EVAR patients generally do not present with the same prevalence of co-morbidity conditions and thus may not have similar surgical risk profiles.

Endovascular repair of the aneurysm can be done safely and recovery in the intensive care unit is rarely required with patients usually discharged home sooner than the OSR patients. Major cardiopulmonary complications also occur less frequently after EVAR than OSR. In addition, the use of hospital resources are decreased with EVAR including transfusion requirements, hospital length of stays, and intensive care monitoring. Patients return to pre-intervention levels of activity more rapidly with EVAR than OSR. Current recommendations for the repair of AAA in intermediate to high surgical risk patients support the use of EVAR.

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