Title Robot-assisted surgery compared with open surgery and laparoscopic surgery: clinical effectiveness and economic analyses

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Aim

To assess the clinical and cost-effectiveness of robotic surgery compared with open procedures and laparoscopic procedures.

Conclusions and results

Robot-assisted surgery was associated with a statistically significant benefit for several short-term clinical outcomes (length of hospital stay, blood loss and transfusion rates, positive margin rates, complications, and operative time), depending on the type of surgery performed (prostatectomy, hysterectomy, or nephrectomy). Comparisons for longer-term outcomes (survival rates and time to return to work) were inconclusive, due to a scarcity of evidence. There were no data from randomized controlled trials and the availability of data on nephrectomy and cardiac surgery was limited. Conclusions based on the economic review varied with respect to the costs and cost-effectiveness of robotic surgery. In the cost-minimization analysis, shorter lengths of stay with robot-assisted prostatectomy reduced hospitalization costs compared with open and laparoscopic surgery. However, because of the high cost of acquiring, operating, and maintaining the surgical robot, the estimated costs of the robotic technology per patient were higher overall.

Methods

A systematic review and meta-analysis of the literature was used to compare the clinical efficacy between robot-assisted, open, and laparoscopic surgeries. A separate systematic review (narrative) was conducted to assess the economic evidence on robotic surgery in terms of study quality, methods, results, and relevance in a Canadian context. In addition, the relative costs of the surgical alternatives were compared in a cost-minimization analysis for radical prostatectomy from the perspective of a publicly-funded health care system.

Further research/reviews required

RCTs are needed for the evaluation of clinical outcomes in all surgical procedures reviewed.

Written by

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