Computer-assisted hip and knee arthroplasty: navigation and active robotic systems: an evidence-based review

Record Status
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Citation

Authors' objectives
This study aims to review the effectiveness and cost-effectiveness of computer assisted hip and knee arthroplasty using navigation and robotic systems.

Authors' conclusions
Computer-assisted arthroplasty using navigation systems is considered to be in the investigational stage. To date, studies have only assessed short-term outcomes; long-term effectiveness (need for revision, implant longevity, pain, functional performance) has not been demonstrated. This is important because a Level 1 study that examined robotic-assisted arthroplasty compared to manual implantation concluded that despite advantages in surgical accuracy, the long-term effects included a higher revision and dislocation rate. Furthermore, at 24 months after surgery, there was no difference between the patients who underwent robotic-assisted and manual implantation in terms of functional hip scores. Computer-assisted arthroplasty using robotic systems is considered to be in the investigational stage and short-term outcomes seem promising. A Level 1 study revealed that there was no statistically significant difference between functional hip scores at 24 months post implantation between patients who underwent robotic-assisted primary hip arthroplasty and those that were treated with manual implantation. Robotic-assisted arthroplasty had advantages in terms of preoperative planning and the accuracy of the intraoperative procedure, however, patients had a higher dislocation rate and more revisions. Additional study is required to further address long-term effectiveness since it was suggested that the use of different prostheses may produce less muscle detachment in primary hip arthroplasty. The current large investigative studies of robotic-assisted arthroplasty underway in the United States to develop information for FDA licensing are awaited with interest. The robotic-assisted technology is not yet licensed by Health Canada or the USFDA.

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