

- Title** Computer Assisted Surgery for Unicondylar and Total Knee Replacement
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- Reference** Technology Review Report - 002/2015, online:  
[http://www.moh.gov.my/index.php/database\\_stores/store\\_view\\_page/30/256](http://www.moh.gov.my/index.php/database_stores/store_view_page/30/256)

**Aim**

To review evidence on the effectiveness, safety and cost-effectiveness of computer assisted surgery for unicondylar and total knee replacement in patients with osteoarthritis

**Conclusions and results**

There was evidence to suggest that computer assisted surgery (CAS) or computer image-based navigation or robotic-assisted procedure was effective for unicondylar and total knee replacement (TKR) in patients with osteoarthritis (OA) compared with conventional surgery. Most of the studies seemed to show an improved and better radiographic parameter outcome with CAS. The two methods (CAS and conventional), however, were found to be equal in clinical, functional, pain, and quality of life scores. The use of CAS was also associated with increased operative time or duration of the surgery.

There was no significant difference on the adverse events between CAS and the conventional technique. The most common early complications experienced by patients were deep infection, decubitus ulcer, anaemia, haematoma requiring draining, arrhythmia and confusion. Postoperative complication rates including deep infection, wound infection, venous thrombosis, loosening, instability, and dislocation or fracture were similar. Only one trial addressed the issue of system reliability; a registration error of computer navigation. The CAS, however, was cleared and approved by the United States Food and Drug Administration (US FDA) for the use in surgical knee and hip procedures, has registered as medical device (Class II) and received premarket notification 510(k) (K141989) since 2008.

There was no evidence retrieved on its cost-effectiveness. However, one study in United Kingdom indicated that the average cost for elective primary TKR using CAS was £5,432 per surgery.

**Recommendations (if any)**

Computer assisted surgery or computer image-based navigation or robotic-assisted procedure has the potential to be used as alternative for conventional TKR in patients with OA, but there were no significant benefits over conventional TKR

**Methods**

Electronic databases were searched, which included PubMed, Medline, Journal @ Ovid full text via OVID, OVID EBM Reviews - Cochrane central register of controlled trials, EBM Reviews - Cochrane database of systematic review, Horizon scanning databases - Centre, Birmingham, Australia and New Zealand Horizon scanning (ANZHSN), FDA website, MHRA website and from non-scientific database - Google search engine. In addition, a cross-referencing of the articles retrieved was also carried out accordingly to the topic. Relevant articles were critically appraised and evidence graded using US/Canadian Preventive Services Task Force.

**Further research/reviews required**

Studies on cost-effectiveness is warranted

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