

BACKGROUND: Total hip replacement (THR) involves the replacement of a damaged hip joint with an artificial hip prosthesis. Resurfacing arthroplasty (RS) involves replacement of the joint surface of the femoral head with a metal surface covering.

OBJECTIVES: To undertake clinical effectiveness and cost-effectiveness analysis of different types of THR and RS for the treatment of pain and disability in people with end-stage arthritis of the hip, in particular to compare the clinical effectiveness and cost-effectiveness of (1) different types of primary THR and RS for people in whom both procedures are suitable and (2) different types of primary THR for people who are not suitable for hip RS.

DATA SOURCES: Electronic databases including MEDLINE, EMBASE, The Cochrane Library, Current Controlled Trials and UK Clinical Research Network (UKCRN) Portfolio Database were searched in December 2012, with searches limited to publications from 2008 and sample sizes of ≥ 100 participants. Reference lists and websites of manufacturers and professional organisations were also screened. REVIEW

METHODS: Systematic reviews of the literature were undertaken to appraise the clinical effectiveness and cost-effectiveness of different types of THR and RS for people with end-stage arthritis of the hip. Included randomised controlled trials (RCTs) and systematic reviews were data extracted and risk of bias and methodological quality were independently assessed by two reviewers using the Cochrane Collaboration risk of bias tool and the Assessment of Multiple Systematic Reviews (AMSTAR) tool. A Markov multistate model was developed for the economic evaluation of the technologies. Sensitivity analyses stratified by sex and controlled for age were carried out to assess the robustness of the results.

RESULTS: A total of 2469 records were screened of which 37 were included, representing 16 RCTs and eight systematic reviews. The mean post-THR Harris Hip Score measured at different follow-up times (from 6 months to 10 years) did not differ between THR groups, including between cross-linked polyethylene and traditional polyethylene cup liners (pooled mean difference 2.29, 95% confidence interval -0.88 to 5.45). Five systematic reviews reported evidence on different types of THR (cemented vs. cementless cup fixation and implant articulation materials) but these reviews were inconclusive. Eleven cost-effectiveness studies were included; four provided relevant cost and utility data for the model. Thirty registry studies were included, with no studies reporting better implant survival for RS than for all types of THR. For all analyses, mean costs for RS were higher than those for THR and mean quality-adjusted life-years (QALYs) were lower. The incremental cost-effectiveness ratio for RS was dominated by THR, that is, THR was cheaper and more effective than RS (for a lifetime horizon in the base-case analysis, the incremental cost of RS was pound11,284 and the incremental QALYs were -0.0879). For all age and sex groups RS remained clearly dominated by THR. Cost-effectiveness acceptability curves showed that, for all patients, THR was almost 100% cost-effective at any willingness-to-pay level. There were age and sex differences in the populations with different types of THR and variations in revision rates (from 1.6% to 3.5% at 9 years). For the base-case analysis, for all age and sex groups and a lifetime horizon, mean costs for category E (cemented components with a polyethylene-on-ceramic articulation) were slightly lower and mean QALYs for category E were slightly higher than those for all other THR categories in both deterministic and probabilistic analyses. Hence, category E dominated the other four categories. Sensitivity analysis using an age- and sex-adjusted log-normal model demonstrated that, over a lifetime horizon and at a willingness-to-pay threshold of pound20,000 per QALY, categories A and E were equally likely (50%) to be cost-effective.

LIMITATIONS: A large proportion of the included studies were inconclusive because of poor reporting, missing data, inconsistent results and/or great uncertainty in the treatment effect estimates. This warrants cautious interpretation of the

findings. The evidence on complications was scarce, which may be because of the absence or rarity of these events or because of under-reporting. The poor reporting meant that it was not possible to explore contextual factors that might have influenced study results and also reduced the applicability of the findings to routine clinical practice in the UK. The scope of the review was limited to evidence published in English in 2008 or later, which could be interpreted as a weakness; however, systematic reviews would provide summary evidence for studies published before 2008.

CONCLUSIONS: Compared with THR, revision rates for RS were higher, mean costs for RS were higher and mean QALYs gained were lower; RS was dominated by THR. Similar results were obtai