Reviewer's report

Title: The impact of preoperative patient characteristics on the cost-effectiveness of total hip replacement: a cohort study

Version: 2 Date: 14 April 2014

Reviewer: James Gaughan

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Major Compulsory Revisions

I do not see how replacing preoperative EQ-5D with the WOMAC removes the regression to the mean problem. Both are measuring health state, so it would be as true for the general measure as for the specific one that patients at the extremes of the distribution are more likely to move towards its mean in future observations. I can understand using a disease specific measure to divide the sample more finely, but that is a distinct justification. It would be better to accept regression to the mean as a limitation arising inevitably from comparing sub-populations by health state. At present I get the impression from the manuscript the problem has been solved.

Despite the reasonable concern about regression to the mean, the ratio results for different subgroups don’t seem to imply this is dominant. Instead, there is a trend of more healthy patients receiving more QALYs and being cheaper than less healthy ones. This could be more clearly drawn out, as noted below, and is also quite surprising. While it is intuitive to me that healthier patients are cheaper to treat, I would expect them to receive less benefit from that treatment, since there is less scope for benefit. Some discussion of this outcome would therefore add value to this paper, particularly as one of its advances is this subgroup analysis.

In modelling QALYs in Table 2, EQ-5D pre-op is included but not WOMAC. The model replacing pre-op EQ-5D with WOMAC is needed to support the assertion in the Results section that this is the most important factor, along with pre-op EQ-5D. Similarly, I do not see the correlation between WOMAC and cost referred to. This also needs to be included to justify creating sub groups with this variable.

Minor Essential Changes

The authors give a thorough explanation of the EQ-5D and a simpler explanation for WOMAC. The one thing lacking from both of these is interpretation. Specifically, the meaning of 1,1,1,1,1 in EQ-5D and 0 in WOMAC.

Discressionary Changes

Having explained the direction of the health measures, see above, it would still be clearest to indicate the interpretation of results in the results section. So...
instead or in addition to making the point that QALY gains are higher when WOMAC is low, to say QALY gains are higher when patients are more healthy.

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests.