Reviewer’s report

Title: An economic model of long-term use of celecoxib in patients with osteoarthritis

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Reviewer: M. Alan Brookhart

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This paper presents an economic model of long-term celecoxib versus non-selective NSAID use.

The main issue here is that the findings of this analysis are dramatically different from another well-known cost-effectiveness study of coxibs by Speigel, et. al. In that study, an ICER of over $240,000 per QALY was reported versus $31,000 reported in this paper. The reasons for these large differences need to be very transparent to the reader.

The model is not presented in such a way so that it would be reproducible; and it is therefore hard to evaluate its plausibility. For example, it is unclear how the timing of events is tracked. A Markov model seems like it would have been appropriate choice for this analysis, but it is not clear if that was used.

Projecting results from a 12-week trial to 21 years of follow-up is speculative. It is reasonable to expect that there is "depletion of susceptibles" phenomenon with NSAIDs, i.e., there are some patients who are vulnerable to developing GI complications on NSAIDs and that may happen quickly. So, that the risk difference between nsNSAIDs and coxib might be large initially but then converge over time. This should be explored in a sensitivity analysis.

Are QALYs are discounted? This is not mentioned in methods anywhere. Given that costs were discounted at 3% per year, if QALYs aren't discounted, results are going to be biased in favor of coxibs.

The sensitivity analysis results need to be presented rather than just mentioned.

0.13 is a big utility decrement for ulcer/dyspepsia relative to the other numbers in the literature. This is not varied and the results may be quite sensitive to this number. It is labeled as the disutility for moderate to severe dyspepsia, but in the paper it came from, it is actually the value for severe dyspepsia. Mild to moderate are in the 0.07 to 0.09 range. Other numbers in the literature are generally smaller. For example, 0.02 in Sullivan Med Care paper, 0.07 in Beaver Dam study, 0.06 in Gerson Am J Gastroenterol.

Finally, all of the relevant treatment options are not represented here. The ICER of celecoxib benefits from patent expiration in 2013. That begs the question of whether treating with nsNSAIDs until 2013 and then switching to celecoxib might be cost-effective. It would also be of interest to know the ICER of continual treatment with a PPI+naproxen/H2-blocker.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article whose findings are important to those with closely related research interests

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.