Reviewer's report

Title: Development and validation of a clinical prediction rule to identify suspected breast cancer: a prospective cohort study

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Reviewer: William Hamilton

Reviewer's report:

This paper describes the derivation and validation of a CPR to identify breast cancer in an Irish breast care unit. The study is well conducted, and although I have a number of suggestions, each of these is minor.

1. The study is in selected patients i.e. those who have been identified as being at somewhat higher risk of cancer by their GP. As such it strictly only pertains to triage WITHIN that population, so I would say that lines 307/308 are extrapolating too far in saying they are of use to GPs. I appreciate now that many more women are being referred, the distinction between the primary care breast symptom population and the secondary care breast symptom population is becoming rather blurred. Even so, I think the authors would need a stronger justification for suggesting their results can be used in PC.

2. Not every woman had a biopsy - so strictly again the 'gold standard' is 'the diagnosis given by the surgical clinic'. That's fair enough (what else could the authors do?) but it would be helpful to add the percentage of women who actually had a biopsy and - if possible - the false negative rate in surgical clinics (I assume this will be very low).

3. I wondered about the derivation of the integers for the risk score. I struggled to understand it, I'm afraid. The simplest method is to use the logOR and then round to the nearest integer. Is that actually what they did?

4. The idea of using their results to triage women is sensible. However, the authors need to consider (and perhaps reject) the concern that atypical presentations of cancer - which would have a low score - may be women who have most to gain from expedited diagnosis.

5. The authors omit from their discussion the idea that cancer decision tools should be specificity driven. i.e. we need to be able to say to a woman, 'this is NOT cancer, and you don't need testing (this is implicit in the decision not to biopsy some women of course). An ROC curve is OK, but arguably, the bottom left of the curve is the really useful bit.

6. The authors should perhaps pick up in the discussion that fact that FH is not predictive - whatsoever. (I'm really pleased with this result, as it one of my hobby horses - I believe that risk factors (like a FH) are of very little - or no- importance in the symptomatic population. It's the symptoms that matter). At the least, they
need to be able to discuss their findings against the QCancer findings which were different.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

'I declare that I have no competing interests’