Reviewer's report

Title: Clinical Decision Support System for the Management of Osteoporosis Compared to NOGG Guidelines and an Osteology Specialist: A Validation Pilot Study

Version: 1 Date: 24 May 2018

Reviewer: John T. Schousboe

Reviewer's report:

This is a descriptive study of the Osteoporosis Advisor (OPAD) clinical decision support tool and a comparison of recommendations for Rx using OPAD compared to NOGG and expert opinion. There is little question that clinical decision support tools are needed to aid primary care providers deciding if patients at risk for fracture should be reassured, prescribed fracture prevention medication, or referred to an osteoporosis expert for further evaluation. OPAD might be such a tool, but the details of this paper leave many questions that should be addressed before the paper is considered for publication.

Major Concerns:

1. Neither this paper nor the referenced 2015 paper indicates how OPAD generates 10 year fracture risk estimates. Was the OPAD model and its parameter coefficients developed and then validated in specific cohorts? If not, are the fracture risk estimates based on FRAX? In that case high correlations between OPAD and FRAX 10 year fracture risk estimates are just a confirmation of a tautology.

2. When I check the Expea website, it appears that OPAD is a commercial technology. Are the fracture prediction model parameter coefficients proprietary information? If so this should be acknowledged.

3. Related to 1 and 2, the correlation between FRAX and OPAD seems less important than how well OPAD predicts fracture in specific populations. While I appreciate that OPAD goes well beyond FRAX by also incorporating additional covariates and making treatment and other management recommendations (and yes this is important), these recommendations are based on the fracture risk estimates, and hence the calibration of the models and how well the OPAD model discriminates between those who will and those who will not fracture is critically important information. I would think any health care delivery system would want to know this before considering implementing this product.
Minor concdrns

4. While the authors emphasize the similarity of treatment recommendations between expert opinion and OPAD, OPAD recommends treatment in an absolute 16% additional patients. For those 16%, what proportion were referred for specialist evaluation, and what proportion did the discrepancy seem to be attributable to higher estimated risk of fracture with OPAD vs FRAX?

5. Weren't the recommendations of NOGG intended to be specific for the UK population? Or is NOGG being used in Iceland currently in clinical practice? If not, I am not sure of the relevance of comparing OPAD recommendations to NOGG. In contrast, the comparison of Icelandic osteoporosis expert recommendations and those of OPAD would seem to be highly relevant.

6. Page 10, lines 5 through 8. I am not sure what the authors message is here. This is phrased as though the similarity of OPAD if BMD is included compared to when BMD is not included is an advantage of OPAD. If so, I do not buy that argument. If the FRAX fracture risk estimates with and without BMD differ by each other by only 1.8%, they too are quite similar.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

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Acceptable
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