Reviewer’s report

Title: Billing by Residents and Attending Physicians in Family Medicine: The Effects of the Provider, Patient, and Visit Factors

Version: 0 Date: 23 Nov 2017

Reviewer: Brian Drolet

Reviewer's report:

This is a retrospective review of billing by various providers at a single institution over 5 years. The authors found higher billing codes among attendings than residents. Unfortunately, they do not have a 'gold standard' by which to compare the codes to determine which codes are most accurate (though we may assume it to be the attending codes). They found attendings have higher coding than residents. This highlights an ongoing issue in resident SBP education. I think that the finding that resident bill lower codes is interesting and worthwhile, however, I would have expected a trend towards the attending codes by the PGY3 group. Could you have further controlled for the age of attending (i.e., # of years in practice)? There are a number of inconsistencies in the data (e.g., Table 1 - more senior residents were less likely to code like attendings.)

This manuscript requires major revision. I suggest removing the gender discussion and focusing on the finding that is clear and consistent: attendings bill higher than residents.

The manuscript also requires revision for language (for example: Abstract/Methods: "pin down the exact..." this is not appropriate scientific writing). The authors should revise throughout with writing assistance if necessary.

Was the decision to examine gender made a priori or was this found on subgroup analysis and then posed as a primary outcomes measure? (it seems odd to examine this)

I don't agree that there is any clear trend in gender based on the results: male attending>female resident>female attending>male resident is not consistent with the more obvious pattern attending>resident

If this can't be rectified than the gender variability should NOT be highlighted, should be removed from the title and the abstract. Can be mentioned that there is variability but there is no good reason that this should be a central part of the manuscript.
Intro:

Except for the primary care exemption rule, no residency program should be dependent on 'resident billing' — in fact, CMS prohibits residents from billing directly for their care except by this rule and you should discuss that here; this study therefore applies only those programs, correct?

You might look at my study, which examines a program for educating residents on billing and coding (Journal of surgical education 74 (2), 199-202), as part of your review.

Why the attention on gender here? Is there a justification for lower coding by females (who also see more patients, which could be used as evidence that they may in fact have lower complexity visits -- even if simply considering time based coding)

The close of your introduction is atypical for scientific writing; also I suggest you focus on the trainee vs attending discussion, I'm not convinced that the gender differences you've discovered have any meaning.

Methods:

Making high and low complexity binary from the 4 level codes is suspect to me; couldn't you run a model that included 4 separate codes?

Results:

In reading your results, it seems like these data were worked quite a bit to get the outcomes you're reporting, truthfully, I get a little lost in here and that's generally not good for your readers. I prefer a results section that is concise and clear.

Conclusions:

Only some of your conclusions are supported (attendings bill higher codes than residents). The gender differences are not clear; you say that males code higher than females, but that is not true in your resident group; and in fact, female residents code higher than female attendings. I don't know how you can explain these differences, and I don't like the suppositions about risk aversion and compensation. These assumptions seem like you are stretching to explain the differences you found in your results.
Are the methods appropriate and well described?  
If not, please specify what is required in your comments to the authors.

Yes

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.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?  
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

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Please indicate the quality of language in the manuscript:

Not suitable for publication unless extensively edited

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