Reviewer's report

Title: Discriminant validity and test re-test reliability of a gait assessment in patients with vestibular dysfunction

Version: 3 Date: 10 August 2015

Reviewer: Robin Criter

Reviewer's report:

Overall, the manuscript is improved since the last review. Specifically, I appreciate the additional information regarding diagnosis and attention to the writing mechanics. However, I see several issues that should be addressed moving forward.

Discretionary Revisions

1. I agree that it is important to note the two patients with BPPV who were treated and cleared of symptoms; however, I do not believe that “cured” is an appropriate word to use in this context.

Minor Essential Revisions

2. I still see several spelling and grammatical errors that make the manuscript difficult to read. Additional careful and thorough editing is necessary. For example, line 67 “the degree in which” might be better understood as “the degree to which” and line 342 “however rather” is redundant.

3. The tests described for vestibular system dysfunction diagnosis all evaluate just one semi-circular canal (i.e., horizontal). I recognize that this is common practice; however, it is becoming common practice to test the superior and inferior canals, as well as the utricle and saccule. I would prefer that this is spelled out a little more clearly, that vestibular deficits were noted for the horizontal semi-circular canal (as opposed to the four other vestibular structures).

4. The statement that patients with BPPV were excluded following re-positioning (line 126) should be re-structured for reading clarity.

5. The authors make a point to include that tandem walking is not clinically feasible and that data were not included in the manuscript. However, I still found many references to the “invalid” results in the Discussion section (e.g., lines 264+ and lines 327+). If these data are to be removed from the manuscript, so should the discussion points regarding the data. It would still be appropriate to include a small discussion on the reasons why tandem should not be used in this manner and how they were found to be invalid. Commenting on its “good test re-test reproducibility” is not consistent with the data presented.

Major Compulsory Revisions

6. Please clarify if the dual-task paradigm included the first parameter (i.e.,
self-selected walking speed) or another parameter. I did not see this described in the manuscript.

7. Within the procedure, it is noted that “gait velocity measurement was used to predict falls or hospitalization [42].” The way this is worded made it seem that this was part of this protocol. As I understand it, this statement is linking gait measurement to treatment or adverse effects. Perhaps “can be used to predict falls…” may read better. This leads to my main question regarding Table 1. The tables are much improved; however, your inclusion of “Diagnosis: n (FGA)” is not quite clear to me. Is “Diagnosis” the header for the vestibular diagnoses”? Is “22 (6)” the mean FGA score with standard deviation? The footnote mentions the FGA cutoff score for increased fall risk, although I believe more information is necessary to clarify these results and your intention for including the cutoff score.

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

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests.