Reviewer's report

Title: Exploring impaired walking dynamics as a new clinical feature in multiple sclerosis

Version: 1 Date: 20 September 2012

Reviewer: Myla Goldman

Reviewer's report:

Authors report on MS subjects compared to controls on performance of the 6-minute and 12-minute walk tests. They focus specifically on the within test performance of subjects during the walk tests. They report on changes in the performance traits of subjects with attenuation in U-shaped walking in MS subjects. Overall, this work is relevant to the growing literature on relevant ambulatory outcome measures.

Major Comments

1) Reviewer is uncertain about the classification as walking distance as static. I think this is inaccurate and somewhat confusing. A static measure would be isolated strength testing, perhaps. Reviewer feels that any walking measure is “dynamic”. Recommend authors give some thought to this and consider alternative descriptors.

2) Group categorization of severe seems to strong, the group performance is on par with the “moderate group” in Goldman 2008 and the median EDSS is 4, there are no subjects with EDSS > 5.0 per provided range. Reviewer feels this group is more accurately described as a “moderate” group.

3) Authors should provide total distance walked in each group to allow for comparisons to other manuscripts regarding study population.

4) Author should provide information regarding sample size calculations

5) It is unexpected the reviewer that the longer distance (12MW) did not relate to subjective fatigue measures, whilst the 6MW does. This seems counter to the hypothesis discussed. Authors should provide more thought/discussion regarding this. Perhaps this is a power issue? The discussion on page 10 regarding this feels inadequate to reviewer.

6) Reviewer feels the title does not capture the manuscript. It is not clear this is a “new clinical feature in MS”. Ambulatory impairment is a well described feature and attenuation in MS subjects behavior has been described by other authors dating back at least to 1999 (Schwid). Reviewer recommends modification of title.

7) Authors should review literature that relates to the concept of attenuation of MS patient performance during walking. Others have reported on this beyond Goldman, et. al. Authors should reference those works (for example: Schwid 1999, Belachew 2012).
Minor Comments

8) Background section, in some sections, reads as a criticizing others works rather than expanding/augmenting. For example, “…by applying appropriate data analysis” (as examples). Reviewer suggests consideration of alternate terms, such as “additional data analysis”.

9) Authors should explain in further detail how the minute-minute distance measures were obtained.

10) Author should be aware/cite Schwid, Neurology 1999 and Phan-ba PLos 2012 – which also speaks to changes in MS subject speed/behavior during walking assessments.