Reviewer's report

Title: Improvement of walking speed and gait symmetry in older patients after hip arthroplasty: a prospective cohort study

Version: 2 Date: 3 June 2015

Reviewer: Katherine Boyer

Reviewer's report:

The authors have addressed a number of my initial concerns however I still find the paper difficult to follow. The methods section is still missing some important. The results involve many different statistical tests and the reporting is not done in a systematic manner again making it difficult to follow. Finally there are some errors, mislabel items in the figures and tables. All points are major compulsory revisions.

Methods:

Ln123: “The line connecting these two points defined the forward…….” What are the two points that are referred to? I assume they are from the calibration files but not clear.

The parameter calculation remains difficult to follow. It's still not clear what portion of the signal is being analyzed in each autocorrelation calculation, i.e. how many data points? I should be able to reproduce the analysis based on the methods section of the paper.

The figure caption implies that a single data trial (all 20 steps) is normalized to 200pts. However the text suggests that a single stride of data was normalized to 200 pts and it goes from 50 ms before the max cranio-caudal signal to the next time this max happens in the time series. Are these strides then concatenated together to create a data file for the auto correlation with 2000 points. This needs to be clarified. It would be helpful to have a figure with showing the auto-correlation data with arrows indicating the P1 and P2 points.

Results:

The results reporting with respect to the statistics are not logical. The stats are very complex for this project because of the number of comparisons made. It remains difficult to follow the results. What was the primary outcome (change over time? )? Which are the secondary analyses (comparison to ref group?, sex changes over time? )? Which statistical tests were used for which comparisons? Did you account for multiple comparisons?

Line 186 “Walking speed differed between sexes (P=0.005) and time points “ belongs with the first paragraph. Lines 186 -190 seem to repeat the information from 183-185.

Paragraph label of “step and stride regularity” introduces new terms that were not introduced in the methods. These would be helpful to include with the parameter
calculation section.
Ln 206-210: is the correlation between the ipsilateral steps affected by the time normalization process? If each stride is time normalized to the same number of point this may eliminate the variation here.
Discussion: is there a relationship between walking speed and asymmetry?
Figures and Tables:
Table 2: Walking speed units are currently m/s2. Please correct to m/s. The mean values for walking speed are very fast? It’s not possible to walk at 5.75 m/s. Please check the data.
Table 2: what do the italicized numbers indicate?
Figure 3: The labels on the figure are confusing. Are walking speed graphs on the right and symmetry index on the left? Which are male and which are female?

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

Quality of written English: Acceptable

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

Declaration of competing interests:
no competing interests