Reviewer’s report

Title: A novel magnet based 3D printed marker wand as basis for repeated in-shoe multi-segment foot analysis: a proof of concept

Version: 0 Date: 22 Jun 2017

Reviewer: Scott Telfer

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The authors present a magnetic two-part marker system designed to help measure in-shoe multi-segment kinematics. The reliability of replacing the makers was tested in static and walking trials and found to be good. I do think using magnets for the wand is a nice idea, but I'm just not convinced that the authors have provided enough justification here to warrant a full manuscript. Other screw-based detachable markers with low profile bases already exist, both custom made by researchers and commercially available.

Major revisions

-It's important to note that the benefits of this marker are for within session testing, and that for multiple sessions where the base elements need to be removed and replaced reliability remains a significant problem for multi-segment foot research.

-Only walking trials were tested. In running and sports movement trials the forces are much greater, are the magnets able to hold reliably during these types of activities?

-Lines 93-98: Using a reference marker here to account for foot movement assumes that the foot and ankle are a rigid body, this is not correct.

-A more thorough discussion is required placing these results in the context of the existing literature. In theory, because of the design of the markers, the variation seen between sessions where the markers have been replaced should be very close to that measured during walking trials without the markers replaced, is this the case?

-I much prefer Bland-Altman plots to be included in reliability studies as this is a simple and intuitive way for the reader to assess the reliability of the data compared to dimensionless ICCs.

Minor revisions

-Having broken a number of markers in my time, I imagine another advantage of this set up is that the marker and wand can be knocked off during gait without damaging the wand?
Are there plans to make the design of the marker system freely available to the research community (i.e. CAD files for printing)? And what are the cost of the marker system compared to standard devices?

Typos: "whit"

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