Reviewer’s report

Title: A novel approach to mapping load transfer from the plantar surface of the foot to the walls of the total contact cast

Version: 1 Date: 28 September 2012

Reviewer: Peter Anthony Lazzarini

Reviewer’s report:

This paper investigates a new method to measure load on the walls of a total contact cast. As the authors have highlighted, this appears to be the first study to attempt to measure this load directly, which is exciting. If the authors are able to further confirm this methodology and their early findings in a larger sample it will dramatically assist our understanding, and facilitate improvements, in off-loading plantar diabetic foot ulcers. This is a unique and very worthwhile paper in this regard. If the method wasn’t so novel and promising, with only two participants, this reviewer wouldn't normally be recommending if for publication in JFAR. However, I commend the authors for investigating an innovative model of measuring this load and look forward to this paper being published in JFAR.

However, there are some areas of the paper that need some clarification and revision before it is ready for publication. The main points that require clarification or correction are:

• Make it clear in the title or abstract that this study involved only two participants
• Outline the statistical analysis used (looks descriptive) and in particular the denominator and numerator for the 23 & 34% reductions
• Reasons behind why the particular participants were chosen
• Reference certain statements or make clearer they are the authors anecdotal experience or assumptions

Once the editors feel these points have been adequately addressed this paper should be of a standard ready for publication in JFAR. Please see major, minor and discretionary revisions points below:

Major Compulsory Revisions

1. Title: As the numbers of participant are limited (n=2), please ensure this is clear by either adding after the existing title “: A pilot methodological study” to align with your stated aims, or “:A methodological case report” or something similar. Or clarifying in the abstract methods (see below point)

2. Abstract: Methods: Please clarify your participants (ie n = 2) here. It took this reviewer until half-way through the Main Manuscripts’ Methods before it was clear to me that this study didn’t contain a much larger sample.
3. Abstract: Methods: Again to clarify for the reader it would be best to mention your statistical analysis (I’m presuming descriptive or similar) as the results look very impressive otherwise.

4. Background: Paragraph 2: Sentence 1. Please reference this statement or make it clear it is the anecdotal experience of the authors. It may seem obvious that this is true to the authors and reviewer, but not to the lay reader.

5. Background: Paragraph 2 & 3. Again please reference the last sentence paragraph 2 and third sentence paragraph 3. Both sentences I’m presuming are citing reference 7 (Burns & Begg)

6. Methods: Paragraph 1. Please state if the participant with a history of diabetes also had a history of plantar foot ulcers and/or peripheral neuropathy as this would seem to be your target population.

7. Methods: Paragraph 5: Sentence 1. Was there a reason and/or reference for the specific walking speed chosen? This would assist others to repeat your methodology

8. Methods: Paragraph 6. I’m unsure how the canvas shoe aided “the rocker effect”, is this strategy cited? I understand the reason to reduce slipping etc.

9. Methods: A sentence or two on your statistical analysis, though descriptive, I think is necessary here as its not entirely clear what the denominator and numerator are to get the 23-34% result later

10. Results: Table 1: The title of the table is a little confusing. Would it be clearer to say “Comparison of step data per participant, plantar foot and cast wall data methods” or similar? Also I’m still confused (it might be just me) as to how the 23% and 34% was determined (again it would be handy to include the numerator and denominator in the table to make this obvious).

11. Discussion: Paragraph 3: Sentence 5. The authors should probably clarify this statement as a number of papers have reported being able to measure shear in research settings (e.g. Yavuz & Davis; Yavuz et al 2008, Yavuz et al 2010). It is probably safer to say “At the present time, it is not possible to clinically measure shear … “

12. Conflict of interest: I would have thought as “PM is the Australian and New Zealand agent for novel gmbh” and that is what is used in this new method that this was a conflict that should be declared.

Minor Essential Revisions
1. Abstract: Results: Last Sentence. As this sentence primarily compares the first sentence’s results to what has been reported in the literature to date, it would be preferable to move this sentence into the Abstract: Conclusion section.

2. Methods: Paragraph 1. It would be preferable to spell out there were only two participants here, plus, the reasoning you chose them.

Discretionary revisions
1. Abstract: Background: Last Sentence. To clarify that the aim of the study is
about developing a new methodology to measure the cast wall load for the readers, perhaps it could be stated: “the aim of this pilot study was to determine the feasibility of a new method to directly measure the load between the cast wall and the lower leg …. “

2. Background: Paragraph 2: Sentence 1. Do you need to state “In the tertiary hospital setting”? TCC’s can also be applied in other settings.

3. Background: Paragraph 4: Last sentence. Possibly change to past tense, e.g. “was in the vicinity of 30%” or even “appears to be similar and in the vicinity of 30%”.

4. Background: Last paragraph: Aims. The same point as Discretionary Revision 1 for aims here as well.

5. Background: Last paragraph: Aims. Also reading on, was one of the aims to determine if the methodology was safe as well since there was a healthy participant and a ‘target’ participant? This may add value to the manuscript?

6. Methods: Paragraph 1. It would be nice to define the setting here as well.

7. Results: Possibly consider moving the last paragraph to be the first paragraph.

8. Discussion: Paragraph 1: Sentence 2. It may be safer to dampen this statement by adding “These directly measured results appear to confirm previous ….”

9. Discussion: Paragraph 2: Sentence 2. Would it be useful to suggest that the new methodology also safely measured these two areas of (previously assumed) high risk areas for breakdown and potentially supports why we need to protect them.

10. Discussion: Paragraph 3: Sentence 3. Possibly qualify this statement, by adding “if time or resources are limited”. As it would appear, as you’ve stated in the last paragraph, that these two high load areas need a much larger sample in future studies to be confirmed as the two areas that should only be measured.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.