Reviewer’s report

**Title:** Arch height change during sit-to-stand: An alternative for the navicular drop test

**Version:** 1  **Date:** 26 May 2008

**Reviewer:** Shannon Munteanu

**Reviewer’s report:**

Thankyou for allowing me the opportunity to review the manuscript titled ‘Arch height change during sit-to-stand: An alternative for the navicular drop test’. The manuscript investigates the reliability and validity of measurements of arch height of the foot in semi- and non-weightbearing positions.

The study is relevant to readers of ‘Journal of Foot and Ankle Research’. There is a clear rationale for the study. Generally, the manuscript is well-written. The aims of the study are clearly described. There are some aspects requiring revision before the manuscript can be accepted for publication. These will be discussed below.

**Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)**

**Literature review/Introduction/Background:**

However, the authors need to make it more explicit why the navicular drop test/measurement of foot mobility is important. There are numerous studies (including Bennett et al., 2001; Bandhom et al., 2008; Loudon et al., 1996 etc) showing/suggesting this measurement is a risk factor and/or associated with lower limb musculoskeletal injuries and the authors may wish to refer to these.

There is an excessive amount of description of previous studies investigating the reliability of the navicular drop test. The authors need to be more concise for this aspect of the review.

**Methods:**

Page 7: Measurements of arch height change. ‘50% of the total foot length was first determined…’ The authors should explain how this was assessed in more detail and provide an illustration to aide the reader. Page 7: ‘…the height from the supporting surface to the dorsal aspect of the foot…was determined…’. How can this measurement be done for the non-weightbearing condition as there would be no supporting surface?

Page 7: The arch height change was recorded in absolute values. This could be problematic as different individuals have different foot sizes. The authors need to calculate arch height change normalised to a reference of foot size measurement
Page 7: Determination of Reliability and Validity

The procedure used to determine reliability involved repeated measurements from images taken of participants’ feet rather than having the participants measured on two more occasions. Although this procedure assesses the reliability of the measurement of arch height by the raters, it excludes participant positioning as a source of error. This could lead to the measurement having a better reliability than in a clinical/research setting. This needs to be acknowledged in the discussion as a limitation.

Page 9: Statistical Analysis

The authors need to calculate/include the 95% confidence intervals for the accompanying ICC calculations.

The SEM was determined as a measure of absolute reliability to express the reliability in the same units as that of the original measurements. Was the ICC value used in the determination of the SEM? If so, this may be problematic as ICCs can be falsely elevated and this will cause the accompanying SEM to falsely show good reliability. An alternative statistic for calculating absolute reliability is the 95% Limits of Agreement statistic. This statistic does not rely on using the ICC in its calculation.

The authors may also wish to include statistical analysis to confirm that there were no systematic differences between the three raters.

I would like to see reliability calculations performed on the arch height change measurement (in addition to the arch height non-weightbearing and weightbearing).

I would like to see the 95% limits of agreement statistic used in the analysis of the validity of the arch height measurements (in addition to Pearson r).

Results:

Page 10, paragraph 1: The use of two, rather than three, decimal points to report ICC values and Pearson r correlation is recommended. Also, include the 95% CI values for ICC calculations.

Discussion:

Page 12, paragraph 2: The authors have calculated ‘normal’ values for arch height change from their sample. The calculation of ‘normal’ values assumes that the distribution of the participant sample arch height change is normal. The authors need to confirm that the distribution of their data is normal. Also, the value obtained is an absolute value and it is suggested that the authors calculate a normalised value (to foot length or to non-weightbearing arch height) to allow for feet of different sizes.

Page 12, paragraph 3: Limitations: The authors need to acknowledge that
reliability was for one experienced clinician only and this may not be
generalisable to other experienced clinicians. Also, the normal values obtained
were for asymptomatic individuals and may not be applicable to other
populations.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of
a term, which the author can be trusted to correct)
Please use metric descriptors of measurements rather than imperial descriptors
throughout the manuscript.
Replace the word ‘subject’ with ‘participant’ throughout manuscript.
Replace the wording ‘interclass’ with ‘intraclass’ when describing the ICC
statistic.
Can the authors be more consistent with the usage of decimal points throughout
the manuscript (i.e., 7.3mm versus 3.35mm, 0.78 versus .83 etc) in text and
tables.
Page 5, line 6: Please include the standard deviation values of each gender.
Page 5, paragraph 2: Was any standardised warm-up protocol used for the
participants prior to data collection. This could theoretically influence arch
mobility.
Page 7, paragraph 2: Can the authors provide basic demographic information for
the twelve participants who were used for the reliability and validity studies?
Page 7: There is inconsistent use of the terms ‘within-rater’, ‘between-rater’,
‘intra-rater’ and ‘inter-rater’. The authors need to be more consistent in this
regard throughout the manuscript and correct typographical errors when using
these terms.
Page 8, line 3: the word ‘obtained’ should read ‘obtain’.
Page 8: line 17: what was the experience of the ‘different rater’ who performed
measurements of arch height using radiographs for the validity component of this
study?
Page 9, paragraph 3: delete the words ‘ICC and SEM values’ and replace with
the word ‘reliability’.
Table 1:
Inconsistent use of abbreviations (i.e., Height versus Ht).
Table 2:
Improve heading.
Use two (rather than three) decimal points for ICCs only.
Lower case ‘r’ for ‘intra-rater’.
Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)

Page 11, paragraph 2: the authors may wish to provide discussion as the effects of rater experience on the reliability of their measurements.

Page 12, paragraph 1: Correlations between digital images and radiographs were good for 50% and 90% bodyweight conditions, yet poor for 10% weightbearing. Can the authors explain why the 10% body weight condition showed poor correlation?

Table 3:
Table 3 can be deleted and data included in text.

**Level of interest:** An article of importance in its field

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

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

**Declaration of competing interests:**

I declare that I have no competing interests.