Reviewer's report

Title: Reliability of two goniometric methods of measuring active inversion and eversion range of motion at the ankle

Version: 1 Date: 3 April 2006

Reviewer: Joost Dekker

Reviewer's report:

General

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

1. The authors make many claims which are not sufficiently supported. For example, on page 9: “Measurements of inversion were more reliable than of eversion (range: ICC 0.91 to 0.96 for inversion and 0.82-0.93 for eversion).” A statistical test to substantiate this claim is missing and the 95% CI’s are overlapping. My impression is that these measurement were not so different. I would like to see a statistical test to support the claim of the authors. Many other claims like this one are made.

I strongly suggest that the authors reanalyze their data using generalizibility theory (see Streiner and Norman and other textbooks on psychometrics). Basically, this would mean that the authors analyze the design presented in Table 1 using ANOVA. This would result in statistical tests of the claims made by the authors.

Alternatively, the authors should drop all claims not substantiated by statistical analyses. However, I strongly prefer the approach using generalizibility theory.

2. The authors have studied 60 ankles of 30 subjects. Clearly, the data on the left and right ankle are not independent. The authors have ignored this and report on 60 ankles. Again, using the approach of generalizibility theory would allow the authors to introduce left and right ankle as a factor in the design, thereby accounting for the interdependence of the left and right ankle.

3. The authors conclude that experience and training do not confer greater consistency of measurement. This claim, like many others, is not supported by statistical analysis. In addition, it should be noted that only three raters were included in the study. These raters differed in experience and training, but they might have differed in other aspects too. This should be acknowledged and the claim on the lack of effect of training should be weakened.

4. The authors compare the goniometric method to a reference standard (Fastrak measurements). The authors conclude that in the sitting position the correlations were higher than in the prone position, suggesting that measurements in the sitting position more closely replicate the actual range of motion. However, in absolute terms, the inversion – eversion ROM was 43.1 +/- 10.1 for sitting using the goniometric method, while the result of the Fastrak measurement was 23.1 +/- 6.9 (see page 9). That means: a discrepancy of 20 degrees ! If one accepts the Fastrak measurement as the reference standard, then the goniometric method clearly is not a valid measurement. The authors should not only study the correlation between the goniometric method and the Fastrak measurement, but also the agreement between these tests in absolute terms. And: the overall
conclusion on the value of the goniometric method should be much more negative: it seems that the goniometric method is not valid (if one accepts the Fastrak measurement as the reference standard).

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

5.
- The tables should be numbered in the order in which the tables are cited in the text.
- The results section in the Abstract is unclear.

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Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:
I declare that I have no competing interests.