Reviewer's report

Title: Design of a randomized controlled ACL injury prevention study.

Version: 2 Date: 19 May 2010

Reviewer: Jay Hertel

Reviewer's report:

Major Compulsory Revisions

Title: The title implies that this is a randomized controlled clinical trial with the primary outcome measure of ACL injury prevention when in fact this is a laboratory based biomechanics study. This must be made obvious to the reader. Please revise the title accordingly.

Abstract, Background: The focus of this investigation is to assess the role of implicit and explicit motor learning yet these terms do not appear in the abstract. Also, the purpose statement implies that you are sure that the training programs will result in improved dynamic stability of the knee, but this actually seems to be the question that is being asked in this experiment.

Abstract, Discussion: There is quite a bit of ambiguity in this section. Statements such as “...suggested to be...”, “...may potentially reduce the ACL injury rate...”, and “...which should maybe more focus...” demonstrate the tenuous scaffolding of this study. This study is measuring biomechanical variables and the potential impact of this study should not be overgeneralized to injury prevention. The emphasis in this section should be on the ability of the intervention strategies being studied to change biomechanical variables, not injury rates.

Methods, Study Design: Where does learning group (implicit, explicit, control) factor into your study design? Also, where do pretest (1st five trials) and posttest (last 5 trials) factor into your study design? It seems to me that your study has two between subject factors: learning group (implicit, explicit, control) and gender (male, female), and one within subject factor: time (pretest, immediate posttest, retention test). The two different movement tasks being tested do not appear to be factors in your design but instead are dependent variable components.

Methods, Study population, power analysis: Justification of the desired effect size of 0.38 is needed. This needs to be put into the context of the unit of measure to be of value to the clinical readership of this journal. Is the desired magnitude of difference of clinical consequence?

Methods, Intervention: Table 1 lists a Control Group, however the details of what this group will do is not described in the text of the methods. Additionally, it is not clear why the control group will not return for the retention test. This seems to be very important in establishing the stability of these measures over time and necessary to truly understand the impact that the implicit and explicit learning
interventions have on the outcomes being measured.

Methods, Statistical Analysis: Several questions here:

-1st paragraph: “…from the first five trials and compared to the last five trials will be analysed using an independent t-test.” How does learning group factor into your analysis? How does the retention test factor into your analysis plan? Also, how does gender factor into this analysis? This does not mesh with what is presented in the last paragraph of this section.

-Last paragraph: Here a linear mixed model is described as the analysis with learning group, gender, and time being the factors of interest. The analysis plan needs to be described more clearly so that it coherently aligns with the study design.

-How do the authors plan to deal with the issues of multiple comparisons? MANOVAs of related dependent variables? Bonferroni corrections?

-A CONSORT flow chart of your study design should be added.

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

**Quality of written English:** Acceptable

**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