Reviewer's report

Title: Electromyographic Analysis of the Three Subdivisions of Gluteus Medius During Weight-Bearing Exercises

Version: 1 Date: 12 March 2010

Reviewer number: 1

Reviewer's report:

Introduction section
(Minor) Lines 9-12. Reference 12 is used to support the GM as 3 distinct sections and then in the next sentence is used as a reference as a homogenous muscle. Confusing.

(Minor) Line 17 states only one study demonstrated significant differences in the 3 components of the GM with the following narrative referencing two studies.

(Major) Introduction (or discussion section or both) should include a detailed description of the anatomy of the GM and the function of the 3 components. The exercises should be compared to the functional anatomy to describe why different components are firing with the different exercises. This is discussed briefly at the end of the introduction section where the posterior subdivision role in external rotation is mentioned. Please explain how the external rotation function is relevant to the wall push as the exercise appears to be a frontal plane motion at the hip.

Methods

(Major) Electrode placement needs more discussion. In particular, how do you know you are over the anterior and posterior aspects of the GM. By your description, it appears the anterior electrode would be over the Tensor. In Earl’s study confirmed placement via palpation of the tensor with a muscle contraction. The placement method used by Earl, as well as the Schmitz method, does not support the method you used. Please describe this further as to what lengths you took to confirm the placement resulted in GM signal and not Gluteus Maximus or Tensor with the posterior and anterior electrodes.

(Minor) Normalizing procedure is confusing. If three separate exercises where used (IR, ER, Abd) with the highest reading from the 3 used, it appears that an external rotation exercise could potentially be used to normalize the anterior component of the GM. Was the normalization standard (exercise) potentially different for each subject?

(Minor) Weight bearing exercises – line 15. Change shin vertically over the foot to leg perpendicular to the floor?

(Minor) What were the exact instructions to the subjects? For example, with the
WP were they told to maximally push their leg against the wall? Suggest using the term “leg” rather than shin.

(Minor) Hip and knee angles with the WS as you discussed later would likely influence results.

(Minor) Did you monitor rotation of the hip with the exercises? For example with the WP exercise, the pelvis was monitored to remain level, was rotation also monitored? (were the ASIS’s monitored to be perpendicular to the wall?). This could have a marked influence on your results.

(Minor) In the discussion you propose that the WP exercise elicits a significant rotary effect through the hip. This needs further explanation. Do you mean rotation in the transverse plane? The exercise appears to be a frontal plane exercise.

(Minor) Check all references. First reference as an example is incorrect. Year of publication is 2005 (14)1

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.