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## Gender Differences Between Muscle Activation during Star Excursion Balance Test on Stable versus Unstable Surfaces

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### Gender Differences Between Muscle Activation during Star Excursion Balance Test on stable versus unstable surfaces

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#### INTRODUCTION

Anterior (A), posteromedial (PM), and posterolateral (PL) directions of Star Excursion Balance Test (SEBT) are used for rehabilitation.<sup>1</sup> Adding unstable surface to the task has been reported to change electromyographic (EMG) activity.<sup>2</sup> Studies have also reported differences in EMG between males and females.<sup>3</sup> **PURPOSE:** To compare EMG of lower extremity (LE) muscles between males and females during SEBT on stable and unstable surfaces.

#### METHODS

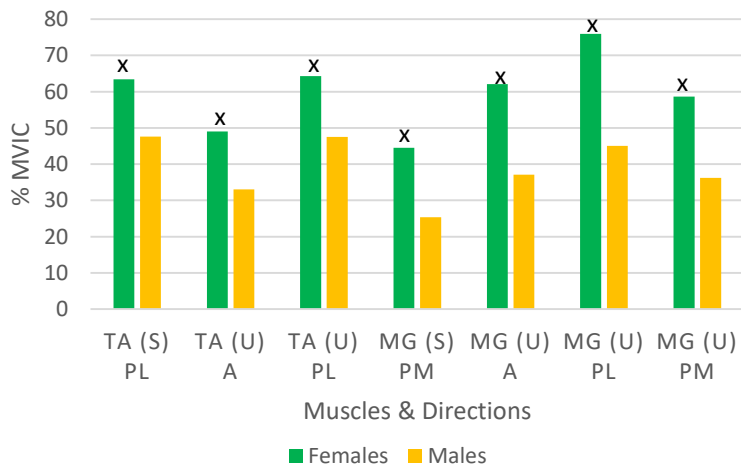
Surface EMG was collected on 10 male and 10 female healthy adults for gluteus maximus, gluteus medius (GMED), medial hamstrings, biceps femoris (BF), vastus medialis (VM), rectus femoris (RF), vastus lateralis (VL), anterior tibialis (AT), and medial gastrocnemius (MG) on the stance leg during SEBT. Unstable surface was introduced using Theraband™ stability trainer. Independent t test assessed differences in EMG between males and females for each direction and each muscle during SEBT for both stable and unstable. Paired t tests were run separately for males and females to determine difference in each direction for each muscle between stable and unstable surface with  $\alpha$  at 0.05. EMG were reported as the percentage of the maximal voluntary isometric contraction (%MVIC).

#### METHODS

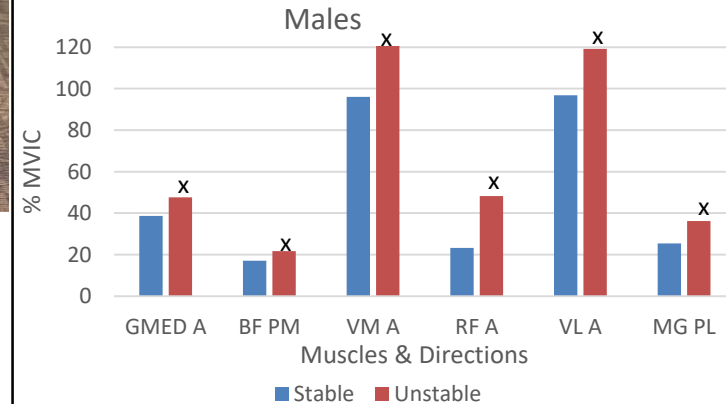
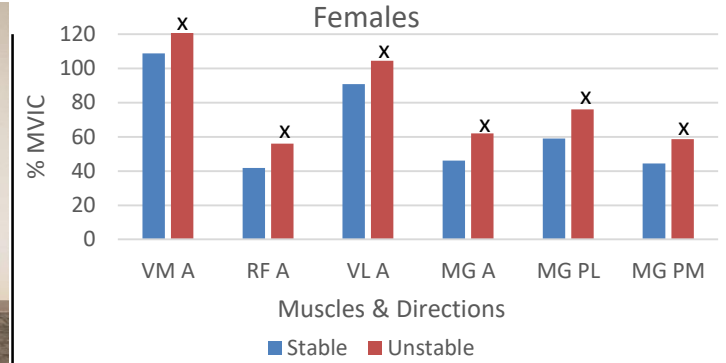


#### RESULTS

##### Gender Difference



#### RESULTS



#### DISCUSSION and CONCLUSION

Females produced higher muscle activation than males for ankle muscles. Adding unstable surface increased LE muscle activation during SEBT across gender. Due to gender differences and surface variability in EMG during SEBT, clinicians could consider incorporating both stable and unstable surfaces during rehabilitation especially for women to reduce ankle injuries.

#### REFERENCES

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