2-2018

Effect of Stable and Unstable Surfaces on the Serratus Anterior Muscle Activation in a Kinetic-chain Exercise Among Healthy Adults

Navpreet Kaur
University of St. Augustine for Health Sciences, nkaur@usa.edu

Kunal Bhanot
University of St. Augustine for Health Sciences, kbhanot@usa.edu

Germaine Ferreira
University of St. Augustine for Health Sciences, gferreira@usa.edu

Effect of Stable and Unstable Surfaces on the Serratus Anterior Muscle Activation in Kinetic Chain Exercises among Healthy Adults

Presented by

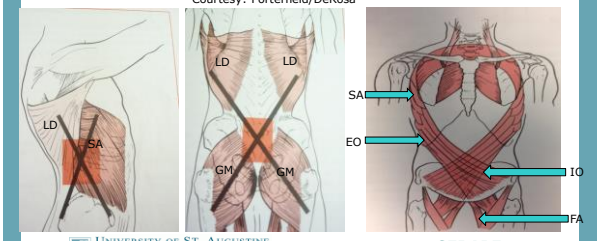
Navpreet Kaur, PT, DPT, PhD, MTC
Co-Investigators
Kunal Bhanot, PT, PhD, MTC, CMTPT, FAAOMPT
Germaine Ferreira, PT, DPT, MSPT

University of St. Augustine for Health Sciences

Laureate International Universities

MYOFASCIAL CONNECTIONS

Courtesy: Porterfield/DeRosa



SERAPE

University of St. Augustine for Health Sciences

PURPOSE

To determine if the serratus anterior (SA) muscle activity changes with kinetic chain recruitment on stable and unstable surfaces.

University of St. Augustine for Health Sciences

Laureate International Universities

METHODS

Subjects

21 healthy males with mean age 26.7 ± 2.6 yrs.

Muscles Analyzed

SA, LD, and EO muscles on the dominant side, GM bilaterally, and FA of the contralateral side

Exercises Analyzed (Stable and Unstable)

FPP, Closed Chain Serape (CS), Open Chain Serape (OS)

University of St. Augustine for Health Sciences

Laureate International Universities

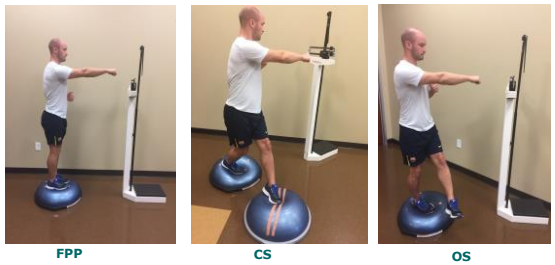
Exercises on the Stable Surface

FPP **CS** **OS**

University of St. Augustine for Health Sciences

Laureate International Universities

Exercises on the Unstable surface



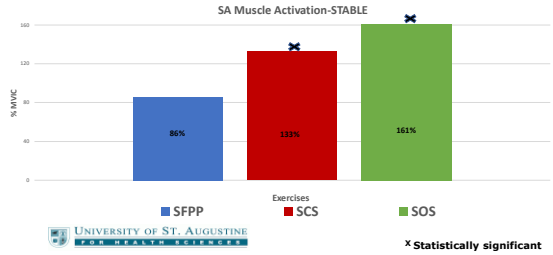
FPP **CS** **OS**

University of St. Augustine for Health Sciences

Laureate International Universities

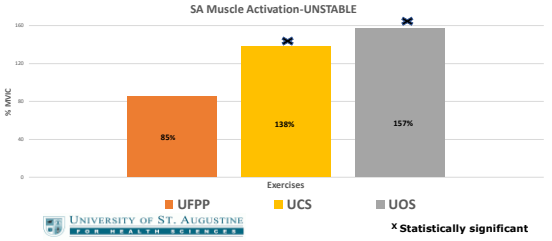
RESULTS

(One-way repeated measures ANOVA)



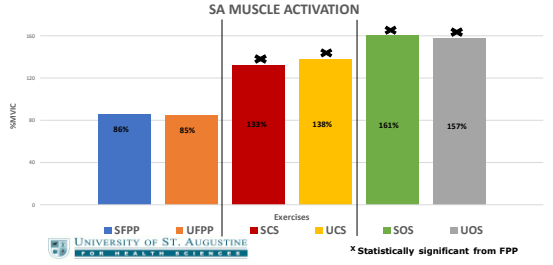
RESULTS

(One-way Repeated measures ANOVA)



RESULTS

(Paired t-test: Stable Vs Unstable)



TAKE HOME MESSAGE

- Our study strengthens the concept of recruitment of the kinetic chain during exercises for better muscle activation.
- Clinicians also need to be aware that adding an unstable surface to an exercise does not always imply higher activation of the involved muscles.

REFERENCES

1.Yamauchi T, Hasegawa S, Matsumura A, Nakamura M, Ibuki S, Ichihashi N. The effect of trunk rotation during shoulder exercises on the activity of the scapular muscle and scapular kinematics. J. Shoulder Elbow Surg. 2015;24(6):955-964.

2. Kaur N, Bhanot K, Brody LT, Bridges J, Berry DC, Ode JJ. Effects of lower extremity and trunk muscles recruitment on serratus anterior muscle activation in healthy male adults. International journal of sports physical therapy. 2014;9(7):924.

3. Maenhout A, Van Praet K, Pizzi L, Van Herzeele M, Cools A. Electromyographic analysis of knee push up plus variations: What is the influence of the kinetic chain on scapular muscle activity? Br. J. Sports Med. 2010;44(14):1010-1015.

4. Behm D, Colado JC. The effectiveness of resistance training using unstable surfaces and devices for rehabilitation. International journal of sports physical therapy. 2012;7(2):226.

5. De Mey K, Danneels L, Cagnie B, et al. Shoulder muscle activation levels during four closed kinetic chain exercises with and without redcord slings. J. Strength Cond. Res. 2014;28(6):1626-1635.

6. Porterfield JA, DeRosa C. *Mechanical Shoulder Disorders. Perspectives in Functional Anatomy*. St Louis, Missouri: USA: Elsevier Science; 2004.

QUESTIONS?