

# EFFECT OF A DERMATOME NEUROPOINT ACTIVATING SOCKS ON OVERALL BALANCE AND STABILITY USING THE SWAY MEDICAL APPLICATION

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## INTRODUCTION

Dynamic and static stability and balance along with postural sway have been identified as having an impact on athletic performance, fall risk, general mobility and overall quality of life.

Recently, socks developed using principles of dermatome and neuro-activation have been touted as being able to enhance balance and stability by promoting optimal proprioception and neural connectivity. If wearing such a sock were to improve both balance and stability it could lead to beneficial effects on gait, postural stability, lateral mobility and dynamic and static knee loading in sports and activities where socks use is common. Improvements in dynamic knee loading that reduce risk of ACL injury may be an important consideration. This study tested the hypothesis that wearing a dermatome and neuro-activating socks improves balance and stability.

## METHODS

69 subjects (44M, 25F) participated in this study after providing IRB- approved informed consent. A priori sample size estimation indicated a desired population of 36 for an effect size of 0.25. Inclusion criteria included: (a) no current pain limiting movement; and (b) no foot or knee condition that would limit the ability to wear the socks. Two socks conditions were utilized for the study: DNS- Dermatome Neuropoint Socks (Voxxx PFA Socks, Voxxx Sports Inc.); RS- Regular Socks (No Name Athletic Socks) The process involved taking a Sway Medical Balance assessment with RS and then the subject replacing the RS socks with the DNS socks and completing the Sway Medical Balance assessment.

Sway Balance is an FDA-cleared mobile balance testing system that measures and scores an individual's balance and stability and can be used to monitor for signs of balance-related dysfunction.

Sway Medical measures stability using the built in motion sensors of any iOS mobile device to quantify postural sway. While the device is pressed against the chest, a proprietary motion analysis algorithm calculates stability and provides an easy to understand value on a 100 point scale with 100 being completely stable and 0 being unstable

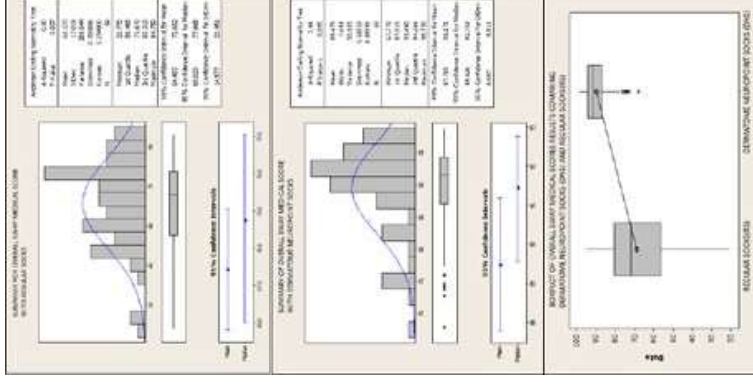
The Overall Score is comprised of the statistical mean of all previous test scores and serves as a baseline or control that can be compared against the latest score to detect change.

A Sway Medical Overall Score of between 80 and 85 is in the 50th per centile, Overall Scores between <80 the 25th percentile and Overall Scores between >85 and 95 are in the 75th percentile.

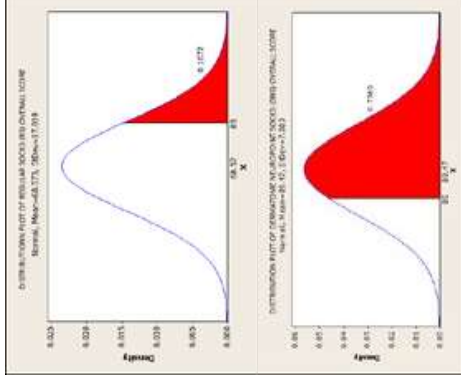
One-way ANOVA F test was performed to compare and identify change in means in DNS and RS Overall Scores: (ANOVAN, Matlab, MathWorks, Inc.) with post-hoc Tukey's HSD comparisons to identify differences between the 2 socks conditions and between sides (MULTCOMPARE, Matlab, MathWorks, Inc.). An a priori significance level of =0.05 was used for all tests.

## RESULTS AND DISCUSSION

Socks condition was a significant main effect. Post-hoc analysis showed that Overall Score was significantly higher for DNS Socks than RS Socks.



**Figure 1. 2, 3** Population marginal means for Overall Score with 95% confidence intervals Dermatome Neuropoint Socks (DNS), and Regular Socks (RS). The DNS Socks appeared to influence neuromuscular and balance and stability control during the Sway Medical testing by increasing the Overall Score relative to the Regular Socks (RS) The increase between socks conditions was 36.1%.



**Figure 4, 5** It is also noted that the Socks Condition was a significant effect Overall Score Population Distribution. Whereas the Regular Socks (RS) condition yielded a population of 16.72% with an Overall Score of greater than 85 the Dermatome Neuropoint Socks (DNS) yielded a population of 73.6% with an Overall score of greater than 85%.

Given the potential benefits from Dermatome Neuropoint Socks (DNS) such as a reduction in known biomechanical injury risk factors and improved balance and stability may require consideration by health, wellness and athletic organizations and authorities to consider general recommendation and use of the DNS socks.

## CONCLUSIONS

This study demonstrated an improvement Overall Balance and Stability Scores in subjects wearing a Dermatome Neuropoint Socks (DNS) compared to a Regular Socks (RS). Future prospective studies are needed to test the persistence of this phenomenon, whether the results carry over to socks that provide pain relief, and whether these observed differences in Overall Scores lead to reduced injury rates.

## ACKNOWLEDGEMENTS

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