

## **Responsiveness of the Sit-to-Stand Test to Measure Lower Body Power**

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*Category: Masters*

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### **ABSTRACT**

Muscle power declines at a faster rate and demonstrates a stronger association with physical function than strength, emphasizing the growing importance of assessing muscle power. The Sit-to-Stand (STS) test is a novel test to measure lower body power that is valid and reliable, while also being portable and affordable. However, its responsiveness to change or longitudinal validity is unknown.

**PURPOSE:** To examine the responsiveness to change of the Sit-to-Stand test in comparison to the pneumatic leg press in measuring lower body power. **METHOD:** 23 community-living adults, aged 50-80, were recruited. Participants underwent a full body strength training workout twice a week for 10 weeks with 8 exercises at a perceived exertion of 7-8 (on a scale of 0-10). Lower body power was assessed pre- and post- intervention using the Tendo Unit (TU) for the sit-to-stand (STS) power and compared against a reference standard, pneumatic leg press (LP). A paired t-test was used to analyze the change in power from the intervention. Cohen's d effect size was used to assess the magnitude of the change, and the response rate was assessed at a power threshold of  $\geq 10\%$ . **RESULTS:** The mean age of the sample was 59 years, of which 61% were women. After 10 weeks of the intervention, peak power measurements improved in both STS [176.22, 95% CI (-274.19, -78.251),  $p=0.001$ ] and LP [95.86, 95% CI (-136.25, -55.473),  $p < 0.001$ ]. Based on Cohen's criteria, a large effect size ( $> 0.8$ ) was observed for both STS [ $d = -0.89$ , 95% CI (-1.44, -0.34)] and LP [Cohen's  $d = -1.05$ , 95% CI (-1.57, -0.52)]. Response rates showed more participants that had greater than 10% increase in STS (77%) compared to LP (50%). **CONCLUSION:** Our results show that the Sit-to-Stand power test is sufficiently responsive to change and demonstrates higher response rates compared to pneumatic leg press.