

## Can changes in sit-to-stand performance throughout a 30-s time interval be used as a marker of muscle fatigability in middle-aged to older adults?

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### RESEARCH AIM

The 30-s sit-to-stand (STS) test is widely used to assess functional capacity in middle-aged and older adults, typically focusing on total repetitions or mean power output. This study investigated performance drops within the 30-s period, which could be indicative of muscle fatigability.

Research questions:

1. Does STS performance drop throughout the 30-s period in middle-aged to older adults?
2. Do changes in performance over time differ between age-groups and sexes?

### METHODS

N = 93 middle-aged (♀ 43, ♂ 50; 55-64yrs) and 102 older adults (♀ 54, ♂ 48 ; ≥65yrs)  
30-s STS test (as fast as possible)

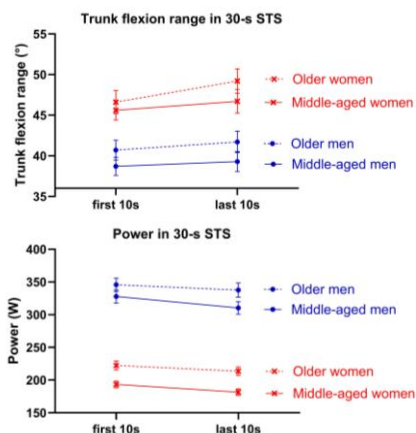


Sensor (DynaPort MoveTest McRoberts) on lower back

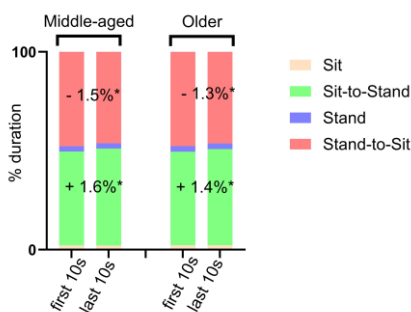
- ↳ Sub-durations of STS phases (i.e., sit, sit-to-stand, stand, stand-to-sit)
- STS trunk flexion range (°)
- STS power (W)
- ↳ Mean of all repetitions in first and last 10s



### RESULTS



**FIG 1.** Mean and SEM of trunk flexion range and power in the first compared to the last 10s of the 30-s STS test. Middle-aged adults and men showed less trunk flexion and higher power production than older adults and women ( $p < 0.05$ ). Performance changed over 30-s time, with more trunk flexion ( $+1.4^\circ$ ,  $p < 0.001$ ) and lower power production ( $-15W$ ,  $p < 0.001$ ) in the last 10s. No time-by-group interaction effect was found.



**FIG 2.** Subdurations in the four different movement phases of the STS, expressed as a percentage of a full STS cycle. In both age-groups, proportionally more time was spent in the sit-to-stand phase and less in the stand-to-sit phase in the last compared to the first 10s (\*  $p < 0.001$ ).

### CONCLUSIONS

Performance in STS movement strategy changes throughout 30-s timeframe:

- More trunk flexion during standing up
- Less braking during sitting down
- Drop in power production

Indicative of muscle fatigue?



Minor changes → clinical relevance in well-functioning adults?