

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 ($\text{♀} 43$, $\text{♂} 50$; 55-64yrs) and 102 older adults ($\text{♀} 54$, $\text{♂} 48$; ≥ 65 yrs)
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 ($^{\circ}$)

STS power (W)

↳ Mean of all repetitions in first and last 10s



RESULTS

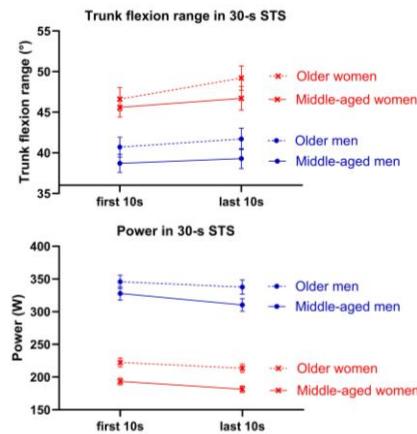


FIG 1. Mean and SEM of trunk flexion range and power in the first compared to the last 10s of the 30-s STS test. Middle-aged adults and men showed less trunk flexion and higher power production than older adults and women ($p < 0.05$). Performance changed over 30-s time, with more trunk flexion (+1.4%,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

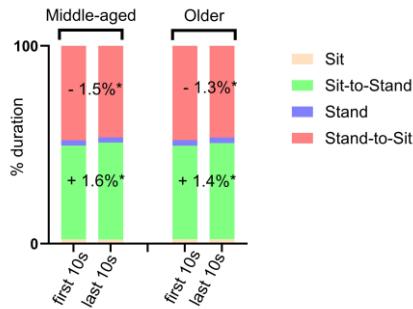


FIG 2. Subdurations in the four different movement phases of the STS, expressed as a percentage of a full STS cycle. In both age-groups, proportionally more time was spent in the sit-to-stand phase and less in the stand-to-sit phase in the last compared to the first 10s (* $p < 0.001$).

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?