



## RehabMove 2018: WHEELCHAIR USERS' SUPRASPINATUS TENDONS CHANGE WITH LOADING: RELATIONSHIP WITH THE SUBACROMIAL SPACE AND SUBJECT CHARACTERISTICS

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**PURPOSE:** Wheelchair users' supraspinatus tendons - continuously loaded during propulsion – are often subject to subacromial impingement causing tendon degeneration and pain. This study aims to identify acute changes in supraspinatus tendon thickness after wheelchair propulsion and to associate tendon thickness with the acromio-humeral distance (AHD) and subject characteristics.

**METHODS:** This quasi-experimental study includes 49 wheelchair users with spinal cord injury, at T2 or below (22 % female;  $50 \pm 10$  years of age,  $27 \pm 12$  years since injury). Participants performed 15 minutes overground wheelchair propulsion including, rests, right/left turns and start/stops. Before and after propulsion, tendon thickness of the supraspinatus was assessed two times for each timepoint with ultrasound and averaged.<sup>1</sup> Covariables include the AHD during a weight relief while retracting and depressing shoulders before and after propulsion, lesion level, body mass index ( $\text{kg}/\text{m}^2$ ), and years since injury.

**RESULTS:** A multilevel mixed-effects linear regression controlling for between subject variability and covariables ( $P < 0.001$ ) demonstrated a reduction in supraspinatus tendon thickness after propulsion (Pre: 5.42 mm; 95 % CI = 5.17 - 5.66, Post: 5.27 mm; 95 % CI = 5.02 - 5.51)( $P < 0.05$ ). Furthermore, persons with an in general thicker supraspinatus tendon had a greater AHD during the weight relief after propulsion (95 % CI = 0.88-7.26) and had more years since injury (95 % CI = 0.014-0.06).

**CONCLUSIONS:** The thicker supraspinatus tendon in persons with more years since injury likely indicates chronic changes associated with arm overuse. Mechanical loading induced by wheelchair propulsion acutely reduced the supraspinatus tendon thickness. Investigating acute changes associated with a common task will likely provide insight into injury mechanisms and possibly highlight ways to prevent injury.

**REFERENCES:** <sup>1</sup> Collinger JL *et al.* Acad Radiol 2009; 16:1424-32.