

## Investigating body composition in wheelchair athletes

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Subjects with spinal cord injury (SCI) are at risk for adverse changes in body composition (BC), which are harmful for their health and relevant to sport performance. This study investigated whole-body and regional BC in wheelchair athletes (WA) by comparing tetraplegic and paraplegic WA with a larger sample of healthy males athletes. Dual-energy X-ray absorptiometry (DXA) was used by one operator to measure subtotal (total-body less head) and regional (arms, legs and trunk) body composition (lean mass [LM], bone mineral content [BMC], fat mass [FM] and fat mass percentage [%FM]) in twenty-seven male WA aged  $30.0 \pm 9.4$  y with chronic SCI. WA were classified as tetraplegic (lesion above T1; Tetra, n=10) and paraplegic (lesion at T1 and below; Para, n=17) and matched each to three healthy males athletes (n=81) on the basis of DXA area and BMI. BC outcomes were compared in Tetra and Para as well as Tetra and Para, and their respective control with the t-test for independent samples. Alpha value was set at 0.05 and p-values corrected for multiple comparisons (pc; Benjamini and Hochberg procedure). Percent FM was significant higher in Tetra vs. Para at the subtotal and regional level ( $0.024 < pc < 0.008$ ). Both Tetra and Para had significantly greater FM and %FM at the subtotal ( $0.006 < pc < 0.001$ ) and regional level ( $0.025 < pc < 0.001$ ) along with lower LM and BMC at the legs ( $pc < 0.001$  for all) vs. able-bodied athletes. At the subtotal level the Tetra group also showed significant lower BMC compared with control ( $pc = 0.016$ ). These results expand on previous findings in non-athlete SCI persons (1) by showing that WA show unfavourable changes in BC in comparison with able-bodied controls and such changes are worse in tetraplegic than paraplegic WA. These results prompt for strategies and innovative interventions aimed at preventing health risks associated with BC changes in immobilized athletes.

### References

[1] Spungen et al. (2003) Factors influencing body composition in persons with spinal cord injury: a cross-sectional study. *J Appl Physiol* 95: 2398–2407.

### Keywords

Paralympic; spinal cord injury; fat mass; lean mass.