

## Arm skin water assessed via tissue dielectric constant measurements at 300 MHz: Dependence on handedness.

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Forearm and biceps skin water measurements are used to detect and assess edema and lymphedema. However, potential differences in features of dominant (DOM) and non-dominant (NDOM) arms make it unclear if handedness per se impacts water content measures based on skin tissue dielectric constant (TDC). Since DOM arms probably have greater muscle mass and less fat percentage than NDOM we hypothesized that DOM arms would have greater TDC values than would paired NDOM arms. Bilateral anterior forearm and biceps measurements were made in 60 seated volunteers. TDC values were obtained to depths of 1.5 and 2.5 mm by touching the skin with a cylindrical probe that measured TDC at 300 MHz. Total body water (TBW), segmental muscle mass (MM) and fat percentages (FAT) were determined using bioimpedance. Results are based on 42 right hand dominant (RHD) and 18 left hand dominant (LHD) subjects. DOM arm MM (% of body weight) was not different from NDOM ( $3.82 \pm 0.77$  vs.  $3.79 \pm 0.78\%$ ,  $p = 0.10$ ). DOM arm FAT was slightly less than NDOM ( $23.4 \pm 9.7\%$  vs.  $24.6 \pm 9.8\%$ ,  $p < 0.001$ ). For the full group ( $n = 60$ ), TDC values did not differ between DOM and NDOM. Forearm TDC values for DOM and NDOM were respectively  $33.9 \pm 3.9$  vs.  $33.6 \pm 3.6$  for 1.5 mm depth, and  $29.8 \pm 4.9$  vs.  $29.7 \pm 4.8$  for 2.5 mm depth. Analyses done for RHD and LHD subjects separately show that DOM forearm TDC values of LHD subjects are slightly greater than NDOM, being  $34.4 \pm 4.3$  vs.  $33.4 \pm 3.6$ ,  $p = 0.010$  for 1.5 mm depth, and  $31.1 \pm 5.1$  vs.  $30.4 \pm 5.3$ ,  $p = 0.05$  for 2.5 mm depth. Differences in TDC values and hence skin tissue water between DOM and NDOM arms are small. For LHD subjects only, a slightly greater DOM forearm TDC value is present. This difference of about 1.0 TDC units may be used to adjust reference TDC values for LHD subjects.

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