

## Age-Related Changes in Male Forearm Skin-to-Fat Tissue Dielectric Constant at 300 MHz

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**Objective:** Our goals were to 1) characterize TDC values at various skin depths in young and older males, 2) determine the dependence of these values on body composition parameters and 3) establish inter-arm TDC ratios for use as normal male reference values.

**Background:** Prior research suggests that tissue dielectric constant (TDC) values are useful to assess localized skin water in females for early diagnosing breast cancer treatment-related lymphedema and TDC values in young adults have shown gender differences. However, no TDC data is available for older males or have ageing effects been studied despite known shifts in water state and other skin age-related changes.

**Methods:** TDC measurements were made to depths of 0.5, 1.5, 2.5 and 5.0 mm bilaterally on volar forearm skin in 60 males in three groups of 20 that had mean ages  $\pm$  SD of  $24.0 \pm 0.9$ ,  $40.0 \pm 12.9$  and  $71.0 \pm 8.0$  years. Total body fat and water percentages were determined via bioimpedance at 50 KHz.

**Results:** 1) for all age-groups TDC values decreased with increasing depth, 2) TDC values were not statistically different among age-groups except at a depth of 0.5 mm, 3) TDC values were highly negatively correlated with total body fat and 4) inter-arm ratios varied little among age-groups and depths.

**Conclusions:** It is concluded that 1) age-related larger TDC values at only the shallowest depth is consistent with skin water shifting state from bound to more mobile in the oldest group and 2) inter-arm ratios at any depth provide a basis to test for unilateral edema.