**Depth Distribution of Thigh Skin-to-Fat Tissue Water**

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**Objectives:** To learn to use tissue dielectric constant (TDC) measurement devices and apply them as part of research training to study biophysical measurement variability. **Background:** Forearm skin TDC-values, used as indices of local tissue water have been shown to vary with the tissue depth included in the measurement but no such data are available for lower extremities. Because TDC-values vary by anatomical site such information is valuable directly as a reference and to help select an appropriate measurement depth for a given test situation. **Methods:** Six male student research-trainees performed self-TDC measurements on both of their anterior thighs while in a seated position to depths of 0.5mm, 1.5mm, 2.5mm and 5.0mm at two sessions 28 days apart. These measurements include both epidermis and dermis with different amounts of subcutaneous fat at the deeper depths. For reference, the TDC value of 100% pure water measured at 300 MHz is about 78. Data was analyzed by a person not involved with the measurements. **Results:** At baseline (day0) TDC-values linearly decreased (r=0.992) with increasing depths with TDC-values (mean±SD) being 36.4±3.5, 34.6±2.6, 31.2±2.2 and 27.1±2.3 measured through 0.5mm to 5.0mm depths. These values were insignificantly different from values obtained 28 days later. **Conclusions:** The anticipated reduction in tissue water with measured depth-volume is consistent with the inclusion of increasing amounts of low-water content fat tissue as observed in forearm. The similarity of the distribution over 28 days suggests that the depth-distribution of water-fat is reasonably constant over this time interval.

**A POSTER PRESENTATION IS REQUESTED**