Arm Skin Water assessed via Tissue Dielectric Constant Measurements at 300 MHz: Dependence on Handedness

> F Brlit, HN Mayrovitz mayrovit@nova.edu Nova Southeastern University

Background

- Tissue Dielectric Constant (TDC)
- Water measurements of forearm and biceps
- Assess: Edema and Lymphedema
- Dominant (DOM) and Non-dominant (NDOM)
- DOM ~ greater muscle mass and less fat percentage vs. NDOM
- <u>Hypothesis: DOM TDC > NDOM TDC</u>

Tissue Dielectric Constant (TDC)

• At around 300 MHz

- free and bound water are quite identical
- MoistureMeterD



• Dielectric constant directly proportional to the water content





Muscle Mass, Body Fat, and Total Body water

 IronMan InnerScan segmental body composition monitor, Tanita BC-558

- Bioimpedance:
 - Total Body Water (TBW)
 - Segmental Muscle Mass (MM)
 - Fat percentages (FAT)





Methods

N=60 seated volunteers
Right Hand DOM (RHD) = 42
Left Hand DOM (LHD) = 18
TDC value depths into skin: 1.5 mm & 2.5mm
TDC measure at 300MHz

Results N=60

	DOM	NDOM	р
MM*	$3.82 \pm 0.77\%$	3.79±0.78 %	= 0.10
FAT	$23.4 \pm 9.7\%$	$24.6 \pm 9.8\%$	< 0.001

• MM: DOM ~ NDOM (was not different)

• FAT: DOM < NDOM (DOM was slightly less)

Results N=60

Forearm TDC	DOM	NDOM
1.5mm	33.9±3.9	33.6 ± 3.6
2.5mm	29.8 ± 4.9	29.7 ± 4.8

TDC values did NOT significantly differ between DOM and NDOM

Conclusions

• Little to no differences in DOM vs. NDOM TDC values

 Handedness is NOT a significant factor in TDC evaluations