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Effects of Limb Dominance and Sex on Upper Extremity Tissue Composition

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PURPOSE: To determine the effects of limb dominance and sex on upper extremity tissue composition. **METHODS:** Fifty-four college-aged individuals (22 males and 32 females) were recruited to participate in this investigation. All participants identified their dominant arm based on writing preference. Participants completed a Dual Energy X-Ray Absorptiometry (DXA) scan to assess tissue composition. Bone, lean, fat, and total tissue mass were recorded from the DXA scan for both arms. Tissue differences were calculated by subtracting the non-dominant arm values from the dominant arm values. Percent fat of the arm was calculated for each arm by dividing the fat tissue mass by the total tissue mass. Limb and sex differences were analyzed using mixed-factorial ANOVAs. **RESULTS:** There was a statistically significant sex \times limb interaction ($p=0.031$) for bone mass. There was significantly ($p=0.001$) greater bone mass in the dominant arm when compared to the non-dominant arm for men (280.0 ± 53.1 and 266.7 ± 55.0 grams, respectively) and women (161.9 ± 24.7 and 156.1 ± 24.2 grams, respectively). Regardless of sex, the dominant arm had significantly ($p\leq 0.001$) greater lean, fat, and total tissue mass than the non-dominant arm. Moreover, there were trends for men to have greater limb asymmetries in lean mass ($p=0.057$) and total tissue mass ($p=0.094$) than women. However, no sex \times limb interaction or main effect of limb were observed for percent fat of the arm. **CONCLUSION:** Limb dominance influenced bone, lean, fat and total tissue mass with the dominant arm exceeding the non-dominant arm for all tissues. However, there was not a significant limb difference in percent fat of the arm for men or women. The dominant arm had greater absolute tissue mass than the non-dominant arm, potentially due to greater usage; however, relative tissue composition is similar between arms.