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The Effects Of Using Three Upper Quarter Y-balance Test Variations On The Obese Population

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PURPOSE: To examine the effects of higher BF% on the performance of the UQYBT in three different starting positions.
METHODS: Twenty-four participants (36.4±13.5 years, 164.0±6.8 cm, 84.6±18.64 kg, 36.1±4.4 BF%) participated in this study. First, BF% was collected using handheld BIA, followed by a 5-minute UE warm-up on an arm ergometer. Participants performed a total of 54 reaches. Three reaches for each direction (medial, inferolateral, and superolateral), hand (right and left), and push-up starting position (traditional, modified, and wall). Participants had a 1-minute break after three trials and 2 minutes between starting positions. Supporting hand, reach direction, and starting position was randomized. The Participants highest reach scores were used for analysis. Repeated measure ANOVAs were used to compare the starting positions followed by post-hoc analysis, alpha=0.05.
RESULTS: Four participants did not complete the superolateral reach in the traditional UQYBT (TUQYBT). One participant did not complete the medial and inferolateral reaches in the TUQYBT. Repeated measure ANOVAs found significant main effects in medial and superolateral reaches, p-value<0.001. Post-hoc analysis found that wall UQYBT (WUQYBT) scores were higher in the medial reach than the modified UQYBT (MUQYBT) and TUQYBT (100.9±12.1 cm, 87.8±9.4 cm, 79.6±18.6 cm, respectively) and in superolateral reach (64.1±8.1 cm, 54.4±6.1 cm, 41.0±19.3 cm, respectively), p-value<0.001. In addition, MUQYBT reach scores in the medial and superolateral directions were significantly higher than TUQYBT, p-value<0.001. No significant difference was found in the inferolateral reach between TUQYBT, MUQYBT, and WUQYBT (61.7±16.2 cm, 66.7±9.0 cm, 64.9±9.5 cm, respectively), p-value=0.126.
CONCLUSIONS: Higher BF% made it difficult for the participant to successfully complete the TUQYBT. The MUQYBT or WUQYBT may be better to test UE health in the obese population. More research is needed.

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The Influence Of Subject Leanness On Statistical Agreement Of Fit3D Parameters During Serial Scans

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Body composition influences numerous health outcomes. The Fit3D Body Scanner (Fit3D Inc., San Mateo, CA, USA) is camera-based system that estimates a variety of anthropometric parameters. Reports on the within-subject variance of its outputs are limited.
PURPOSE: To evaluate the agreement of Fit3D parameters on a bodybuilder during a period of consistent weight loss.
METHODS: We tested a 30-year-old female IFBB professional bodybuilder on the Fit3D system every Saturday for 10 consecutive weeks during contest preparation. Each session occurred at 6:30 AM following a 12-hour fast of food and fluids, and consisted of 6 sequential scans. We exported weight, waist circumference (WC), hip circumference (HC), lean mass, fat mass, body fat percent (BF%), trunk to leg volume ratio (TLVR), a body shape index (ABSI), surface-based body shape index (SBSI), and body shape rating (BSR). For each variable, we calculated mean, variance, standard deviation, and intra-class correlation coefficient (ICC; two-way mixed, absolute agreement).
RESULTS: Upon initial testing, weight was 107.1 ± 0.7 lb, WC was 28.5 ± 0.3 in, HC was 34.9 ± 0.2 in, lean mass was 87.0 ± 1.9 lb, fat mass was 20.1 ± 1.8 lb, BF% was 18.8 ± 1.7%, TLVR was 1.5 ± 0.1, ABSI was 0.1 ± 0.0, SBSI was 0.1 ± 0.0, and BSR was 62.3 ± 4.7. At week 10, weight was 96.6 ± 0.1 lb, WC was 25.4 ± 0.3 in, HC was 32.2 ± 0.2 in, lean mass was 86.8 ± 5.5 lb, fat mass was 9.8 ± 5.5 lb, and BF% was 10.2 ± 5.7%, TLVR was 1.6 ± 0.4, ABSI was 0.1 ± 0.0, SBSI was 0.1 ± 0.0, and BSR was 70.4 ± 2.4. Reproducibility of these measurements ranged from excellent to poor: weight (ICC=0.997; 95% CI: 0.994, 0.999), WC (ICC=0.971; 95% CI: 0.932, 0.991), HC (ICC=0.971; 95% CI: 0.934, 0.992), ABSI (ICC=0.728; 95% CI: 0.494, 0.915), fat mass (ICC=0.695; 95% CI: 0.450, 0.902), BF% (ICC=0.572; 95% CI: 0.306, 0.848), BSR (ICC=0.537; 95% CI: 0.268, 0.830), lean mass (ICC=0.326; 95% CI: 0.089, 0.698), TLVR (ICC=0.083; 95% CI: -0.073, 0.456), and SBSI (ICC=0.072; 95% CI: -0.079, 0.440).
CONCLUSIONS: Satisfactory reproducibility was found in most Fit3D outputs evaluated. At a leaner composition, variances were larger in several features of body composition, including lean mass, fat mass, and BF%.

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Cross-validation Of The Army's Body Fat Percent Estimation Formula Using A Three-compartment Model

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PURPOSE: The purpose of the present study was to determine the agreement between a 3-compartment model (3C), the Army's body fat percentage (BF%) prediction methods, bioelectrical impedance spectroscopy (BIS) and a consumer grade bioelectrical impedance analysis (BIA) device for assessing body composition in ROTC cadets.
METHODS: The body composition of 26 ROTC cadets was evaluated (8 F, 18 M; age: 20.2 ± 2.0 y; body mass: 78.9 ± 13.6 kg; height: 175.3 ± 9.4 cm; BMI: 25.3 ± 2.8 kg/m^2) using three compartment (3C) values produced using body volume from air-displacement plethysmography (ADP), body water from BIS, and body mass from a calibrated scale. A multifrequency BIA device was also used to estimate BF%. Body circumference measures were taken at the neck, waist, and abdomen and used to predict BF% using a chart to find the intercept between the circumference value and height. An additional calculation was performed for males (BF% = [86.010 x Log10 (waist - neck)] - [70.041 x Log10 (height)] + 36.76) and females (BF% = [163.205 x Log10 (waist + hip - neck)] - [97.684 x Log10 (height)] - 78.387). Army-derived measures of BF%, BIS BF%, and BIA BF% were compared to 3C values using paired t-tests, Pearson correlations, and the standard error of the estimate (SEE).
RESULTS: 3C BF% estimates did not differ from BIA (1.02%, 95% CI: -2.1, 4.2%) or BIS (0.76%, 95% CI: -2.6, 4.1%), Army BF% Chart (-1.6%, 95% CI: -4.7, 1.4%) or Army BF% Calc. (-1.2%, 95% CI: -3.9, 1.5%). ADP BF% was significantly different compared to 3C BF% (2.0, 95% CI: 0.3, 3.7%). All BF% estimates were significantly correlated with 3C (r: 0.65 to 0.90; R2: 0.42 to 0.81, p<0.001 for all). SEE values for BF% ranged from 0.83 to 1.61%.