RESULTS: Without the gender term in the regression model, mass exponents for both M_B (*b*; 95%CI: 1.28; 1.11-1.45) and M_T (+1.32; 1.14-1.49) were significantly higher than +1.0 (model P<0.001; R^2 = 0.79). With the gender term, however, mass exponents for neither M_B (1.05; 0.85-1.25) nor M_T (1.09; 0.89-1.29) differed from +1.0 (model P<0.001; R^2 = 0.82).

CONCLUSIONS: The mass exponents for both M_B and M_T did not differ from the theoretical +1.0 value attributed to gravitational resistance when accounting for gender. The reason for the need to include the gender term, however, is not clear and may be an artifact of the imbalance between men (n=16) and women (n=4) in this study.

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Evaluation Of Longitudinal Combine Performance Assessments In Ncaa Division Two Football Athletes

Haley L. McVannel, Christopher C. Winter, Jeremy L. Knous. *Saginaw Valley State University, Saginaw, MI.*

Email: hlmcvann@svsu.edu

(No relationships reported)

INTRODUCTION: Combine style assessments provide information regarding athlete's strengths, weaknesses and ability. Values allow strength and conditioning professionals to assess training objectives and method of operation.

PURPOSE: To evaluate longitudinal combine performance assessments in NCAA Division II football athletes.

METHODS: One hundred fifty-four football athletes participated in combine style assessments over three years using six time points (16WI, 16SU, 17WI, 18WI, 18SU, 19SU). Tests included vertical jump via Vertec, broad jump via meter tape, electronically timed 40-yard dash, stopwatch or electronically timed pro-agility run, and maximal power clean, back squats, and bench press. For data analysis, positions were condensed into categories of Bigs (offensive and defensive lineman) Skill (wide receivers, running backs, defensive backs) and Big Skill (quarterbacks, tight ends, linebackers). Descriptive statistics and comparative analysis, mixed methods regressions, were performed using SPSS (version 24.0) with significance set at p ≤ 0.05.

RESULTS: Athletes displayed significant increases in back squat (F=4.965, p<0.0005), power clean (F=3.164, p=0.008), and bench press (F=4.329, p=0.001) as they participated in subsequent assessments. Athletes displayed significant decreases related to subsequent assessment in broad jump (F=3.889, p=0.002), vertical jump (F=3.146, p=0.009), pro-agility right (F=2.555, p=0.028) and left (F=2.797, p=0.017). Squat (F=4.931, p<0.0005), power clean (F=2.806, p=0.017), 40-yard dash (F=4.369, p=0.001), pro-agility left (F=4.509, p=0.001), and right (F=4.329, p=0.001) performance improved with subsequent assessments and was significantly related to position category (Skill<Big Skill<Bigs). Bench press (F=4.827, p<0.0005) performance was significantly related to subsequent assessments and position category (Skill<Big Skill<Bigs). Broad jump (F=4.415, p=.001) and vertical jump (F=3.707, p=0.003) performance were significantly related to subsequent assessments and position category (Skill>Big Skill>Bigs).

CONCLUSION: Subsequent assessment had an impact on combine performance results. Further, position categories have differing attributes that will impact combine performance values.

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Stressful Exercise Reveals Hidden Correlations Between Anthropometric Measurements And Cardiovascular Parameters

Sawsan M. Muthana, Anila K. Maskeen, Emily A. Freund, Jennae M. Fenton, Nick J. Rein, J. Mark VanNess, Courtney D. Jensen. *University of the Pacific, Stockton, CA.*

Email: s_muthana@u.pacific.edu

(No relationships reported)

Camera-based girth measures paired with multi-spectrum bioelectrical impedance spectroscopy can aid in bodily measurements helpful for assessing composition. Fit3D is a relatively new technology for the determination of anthropometric circumferences. There are known relationships between abdominal obesity and blood pressure, but there are fewer investigations exploring the relationship between peripheral circumferences and cardiovascular parameters.

PURPOSE: To evaluate relationships between anthropometric measurements calculated by the Fit3D to pre- and post-exercise blood pressure values.

METHODS: 17 subjects (7 female, 10 male) underwent laboratory testing beginning with a body composition assessment by the Fit3D (Fit3D, Inc., USA). Subjects then had resting heart rate and blood pressure recorded, followed by a treadmill VO_2 max assessment during which ventilatory threshold was identified using the V-slope method. This value was used to determine work rate in a subsequent 60-minute exercise session. Immediately after exercise, subjects were retested on the Fit3D and had post-exercise values of heart rate and blood pressure collected. Descriptive statistics characterized the study sample; simple linear regressions tested the relationships between anthropometric assessments and cardiovascular parameters.

RESULTS: Subjects were 20.5 ± 1.7 years old, weighed 73.8 ± 15.4 kg, had a body fat of 24.2 ± 6.6%, resting heart rate (HR) of 78.1 ± 14.9 bpm, systolic blood pressure (SBP) of 122.8 ± 4.6 mmHg, and diastolic pressure of 74.6 ± 4.9 mmHg. Fit3D-calculated "Body Shape Rating" was unrelated to HR at baseline (p=0.297) but a higher value predicted a lower post-exercise HR (β=-0.691, p=0.033). Resting forearm circumference was unrelated to SBP (p=0.978) and DBP (p=0.539), but post-exercise forearm circumference predicted both SBP (β=1.336, p=0.031) and DBP (β=1.823, p=0.038). Calf circumference was unrelated to SBP, but demonstrated trends with DBP at rest (β=0.942, p=0.033) and post-exercise (β=1.403, p=0.080). Upper arm and upper leg circumferences were unrelated.

CONCLUSION: In a condensed age group, stressful exercise seemed to reveal otherwise-hidden correlations between peripheral anthropometric measurements and cardiovascular assessments.

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A Simulated Climbing Test Is Correlated With Total Work From The Wingate Anaerobic Test

Dustin D. Dunnick, Kayla Wright, James W. Navalta, FACSM, Brian K. Schilling. *University of Nevada, Las Vegas, Las Vegas, NV.*

(No relationships reported)

INTRODUCTION: The Wingate Anaerobic Test (WAnT) is a popular test for measuring lower-body anaerobic capacity and related variables. However, it may be beneficial for athletes in activities where the whole body is utilized to perform an anaerobic test that includes both the upper and lower body. Simulated climbing machines may provide comparable anaerobic capacity test results to that of the WAnT.

PURPOSE: To determine if a distance climbed 30-s maximal-effort test on a simulated climbing machine correlates with WAnT variables, specifically total work (anaerobic capacity).

METHODS: 32 participants were recruited from the local university population and reported to the lab five times. Day 1 included reading and signing the IRB approved informed consent, recording of anthropometric data, and practicing the protocol on both the cycle ergometer (Monark 598E) and simulated climbing machine (Versaclimber SM Sport). On days 2-5, participants performed the anaerobic test protocol on each machine twice using a random order. The WAnT protocol used a 7.5% body mass resistance with a 3-5-minute warm-up followed by 30-sec of maximal effort cycling. The climbing protocol included a 3-5-minute warm-up with no resistance followed by a 30-sec maximal effort climb with the lowest resistance possible on the machine. Each protocol was performed twice on two separate days. Intraclass correlation coefficient (ICC3,1) were calculated between two trials of the WAnT total work (J), between the two trials of the climber for distance climbed. Bivariate correlations were calculated for total work on the WAnT and distance on the climber.

RESULTS: Fifteen males (24.8±6.5yrs; 176.2±5.4cm; 77.0±13.5kg) and fifteen females (23.1±4.1yrs; 159.4±6.4cm; 69.2±13.8kg) completed the study. A high degree of test-retest reliability was found for WAnT total work (ICC= .99 [.98-.99], p<0.001) and climbing distance (ICC=.94 [.93-.99], p<0.001). WAnT total work and climbing distance were significantly correlated, r = .81, p < .001.

CONCLUSIONS: Simulated climbing machines may be a reliable method for performing anaerobic capacity testing. Athletes involved in actives involving both the upper and lower body may have a greater benefit using a simulated climbing machine over the traditional cycle ergometer.