#1
TITLE: COMPARISON OF FOUR BODY COMPOSITION METHODS

AUTHORS: Travis Combest, PhD,[1,2]; James Tufano, PhD[1]; Michael Lane, PhD[1]; and Jordan Moon, PhD[1]

Affiliations: [1]Concordia University of Chicago, River Forest, IL, [2]Walter Reed National Military Medical Center at Bethesda, Bethesda, MD

First author's contact: Traviscombest@yahoo.com

BACKGROUND: High-frequency (500Khz) direct segmental multifrequency bioelectrical impedance analysis (BIA) accurately calculates total water mass and body fat% (BF%), but it is unknown whether higher frequencies (1000Khz) increase measurement accuracy. PURPOSE: This study compared BIA 500Khz, BIA 1000Khz, the Department of Defense DoD Circumference Method (CM), and the reference standard DEXA. METHODS: A total of 62 participants from the military healthcare system (n=25 males, 38.8±11.4yrs, n=37 females 43.7±15.95yrs) were measured. BF% was estimated via DEXA, BIA 500, BIA 1000, and CM to identify the relationship between methods using Pearson Correlation, Intraclass Correlation Coefficients, and Bland Altman Plots ($p < .05$). RESULTS: CM BF% estimates displayed significant moderate correlations with BIA 500 (males r=.63, ICC=.76; females r=.77, ICC=.85), BIA 1000 (males r=.59, ICC=. 74; females r=.77, ICC=.85), and DEXA (males r=.62, ICC=.62; females r=.73, ICC=.82). BIA 500 BF% displayed significant strong correlations with BIA 1000 (males r=.99, ICC=.99; females r=.99, ICC=.99) and DEXA (males r=.93, ICC=.94; females r=.89, ICC=.89). Lastly, BIA 1000 BF% also showed a significant strong correlation DEXA (males r=.93, ICC=.94; females r=.84, ICC=.90). Evaluating proportional bias using a Bland-Altman analysis confirmed an overall mean bias of -1.72% (CM and DEXA) in the female group, indicating the tendency of DEXA to underestimate BF% compared to CM, limits of agreement from -14.24 to 10.8. There was an upward slope of .33 as the CM BF% decreased and the DEXA BF% increased. There was agreement of BF% to 32%, but after 32%, there was more dispersion from the mean and outliers and with a significant trend for a greater difference in BF% between CM and DEXA ($p<.05$). CONCLUSIONS: The correlation was higher between BIA 500 and BIA 1000 to DEXA when compared to CM. There was proportional bias between DEXA and CM in the female group with CM underestimating BF% compared to DEXA.When compared to BIA methods, BF% estimated via CM methods do not correlate well with BF% from DEXA. However, it does not seem as though higher BIA frequencies better predict BF%. The views expressed in this abstract are those of the author(s) and do not necessarily reflect the official policy of the Department of Army, Navy, Defense, or any other agency of the U.S. Government, nor should any official endorsement be inferred by the Department of Defense, or the U.S. Government.

#2
TITLE: INTERNATIONAL CRITERIA EKG COMPARISON STUDY

AUTHORS: Ludmila Cosio-Lima, PHD[1,2]; Lincheng Lee, MD[1]; Armaghan Mahmoudian, PhD[1]; Lauren Adlof, EdD[1]; Youngil Lee, PhD[1]

Affiliations: [1]University of West Florida, Pensacola, FL; LL, [2]Baptist Heart and Vascular Institute, Pensacola FL

First author's contact: lcosiolima@uwf.edu

BACKGROUND: There has been an evolution of athlete specific Electrocardiogram (EKG) criteria over the years, resulting in improved specificity and lower false positive rates, starting with the European Society of Cardiology 2005 guidelines and most recently with the current 2017 International Recommendations. The consistency of EKG interpretation with the 2017 International Criteria have been compared between various groups, including local and specialized center physicians. Whether novice EKG interpreters (undergraduate/graduate students) can be taught to accurately interpret athletes' EKGs with the 2017 International Criteria has not been extensively studied. This study seeks to assess the accuracy and variability of novice EKG interpreters, compared to cardiologist interpretations and expert readers. METHODS: Three novice EKG interpreters (undergraduate exercise science students) were trained in interpreting EKGs of athletes with the 2017 International Criteria during one semester under the instruction of an expert reader. During an annual high school, sports screening day 1350 EKGs were collected and assigned a corresponding number. The on-site cardiologists evaluated the EKGs in real-time and classified as "normal" or "abnormal" according to the International Criteria. Following the sports physical day, three novice EKG interpreters (students), a cardiologist and a Clinical Exercise Physiology Professor (expert reader) were asked separately to classify the same EKGs as "normal or "abnormal" according to the International Criteria. All readers were blinded to the initial classifications made by the cardiologist during the sports physical event. Information regarding the athlete's age, gender, race/ethnicity, and sport was provided on the EKGs. We assessed the agreement between the cardiologist, expert reader and students in interpreting EKGs using Fleiss' kappa analysis. RESULTS: 1350 athlete EKGs (males = 879; females = 471, age (mean + SD) 15.09+1.3y) including 37 (2.7%) abnormal cases were reviewed. The inter-rater agreement between novice readers, expert reader, and physicians in classifying an EKG as abnormal was good ($k = 0.7$, $p < .001$). CONCLUSION: This study demonstrated that novice EKG readers could correctly classify EKGs based on the International Criteria as "normal and abnormal" to identify athletes at high risk of acute cardiovascular events

#3

TITLE: ASSESSMENT OF A SELF-PACED PROTOCOL FOR TESTING AEROBIC CAPACITY IN SCI INDIVIDUALS

AUTHORS: Tyler Langford, PhD[1]; Jennifer Caputo, PhD[2]; Sandra Stevens, PhD[3]

Affiliations: [1]Lincoln Memorial University; [2]Middle Tennessee State University; [3]Belmont University

First author's contact: tyler.langford@lmunet.edu

BACKGROUND: Underwater treadmill (UT) exercise is a recent and sparsely tested modality that may be beneficial for those with incomplete spinal cord injury (iSCI). Currently, VO2max and HRmax have not been assessed during UT exercise among those with iSCI. This study's purpose was to determine if a rating of perceived exertion (RPE) based max exertion protocol used with a motorized UT can elicit criterion-based max physiological responses among those with and without iSCI. METHODS: Healthy adult males with iSCI (n=4; Age=49.8 +/- 3.9 yrs) and without iSCI (n=4; Age=50.0 +/- 7.2 yrs) participated. Borg OMNI RPE scale was used by participants to estimate intensity of exercise. Each participant reported to the lab on two occasions. On visit one, they completed informed consent papers and familiarization with the RPE scale and UT exercise. On visit two, they completed a speed-based, self-regulated incremental exercise test on the UT. Prior to all testing, the UT was filled and set to 92°F. Upon arrival, HR monitor and mask for gas collection were donned. Water height was modified to the xiphoid process. The test consisted of rest, warm-up, incremental exercise, and active recovery phases. For warm-up, treadmill speed was adjusted to 0.5 mph for 3 minutes. After walking 3 minutes, speed was increased to 0.75 mph for another 3 minutes. The incremental exercise phase consisted of four stages, 3 minutes in duration, totaling 12 minutes. For each stage, participants self-selected a speed perceived to correspond to RPE levels: 3, 5, 7, and 10. Treadmill speed was hidden from participants. At each stage's start, speed was only adjusted during the first minute until reaching the proper RPE. During the final stage, treadmill speed could be changed freely until volitional exhaustion. The test ended when volitional exhaustion was reached, at which point the speed was lowered for an active recovery. An independent samples t-test was used to compare time (minutes) until volitional exhaustion. Separate independent samples t-tests were used to compare the highest achieved HR and VO2 values. RESULTS: All iSCI participants achieved a VO2peak. Only 1 participant without iSCI achieved a VO2max. Mean VO2 was significantly lower, $t(6)=3.81$, $p=.027$, for those with iSCI (13.88 +/- 10.57 mL/kg/min) than those without iSCI (34.50 +/- 2.38 mL/kg/min). CONCLUSION: This study shows that the UT is a safe modality for graded exercise testing for those with and without iSCI. An RPE-regulated protocol may not be effective for eliciting criterion-based maximal aerobic results with the UT, but was well tolerated by those with iSCI. Those with iSCI may have lacked lower limb strength to achieve max workloads. Being able to use the UT to test peak aerobic fitness allows clinicians to track improvements in economy following UT training. More research of this modality is encouraged with larger samples to further evaluate potential testing protocols among this population.

#4

TITLE: A COMPARISON OF GUIDELINES FOR HEART TRANSPLANT CONSIDERATION BASED ON CPET DATA

AUTHORS: Clinton A. Brawner, PhD, ACSM-CEP[1]; Jonathan K. Ehrman, PhD, ACSM-CEP[1]; Steven J. Keteyian, PhD[1]

Affiliations: [1]Henry Ford Hospital & Medical Group, Detroit, MI

First author's contact: cbrawne1@hfhs.org

BACKGROUND: The International Society for Heart and Lung Transplantation (ISHLT) recommends using peak oxygen uptake (VO2≤12 mL/kg/min), percent predicted peak VO2 (ppVO2≤50%), or the ventilation to carbon dioxide slope (VE/VCO2 slope>35) to guide listing for heart transplantation (HTx) in patients with heart failure with reduced ejection fraction (HFrEF). Data comparing the mortality rates between each of these thresholds is lacking. The purpose of this retrospective cohort study was to describe the 3-year mortality rate among patients with HFrEF based on the ISHLT recommendations. METHODS: This was a secondary analysis of a combined cohort of patients (≥18 years) with HFrEF from Henry Ford Hospital (n=1,063) and the HF-ACTION study (n=1,772). The cohort was limited to patients who completed a cardiopulmonary exercise test on a treadmill and were prescribed a beta-adrenergic blockade at the time of the test. The primary outcome was probability of all-cause mortality at 3 years based on Kaplan-Meier estimates. Patients were censored at the date of HTx, left ventricular assist device implant, or last known alive. Mortality rates were calculated for patients with a peak VO2≤12 mL/kg/min, ppVO2≤50%, and VE/VCO2 slope>35. The cohort was stratified by sex, age, obesity (body mass index [BMI]> 30 kg/m2), and peak respiratory exchange ratio (RER). Mortality rates were compared to the 3-year mortality post HTx reported by ISHLT. RESULTS: In our combined cohort (n=2,775; age=57±13 y; 19% women; 48% non-white), 3-year mortality for peak VO2≤12 mL/kg/min, ppVO2≤50%, and VE/VCO2 slope>35 was 30%, 31%, and 28%, respectively. Each of these are higher than the 3-year mortality post HTx (20%). Similar results were observed by age below/above 50 y, BMI < versus > 30 kg/m2, RER ≤ versus >1.05, and within men. However, among women the 3-year mortality was 18% for peak VO2≤12 mL/kg/min, 25% for ppVO2≤50%, and 21% for VE/VCO2 slope>35. CONCLUSIONS: ISHLT recommendations to guide listing for HTx for peak VO2≤12 mL/kg/min, ppVO2≤50%, and VE/VCO2 slope>35 are associated with a higher 3-year mortality than patients post HTx irrespective of age, obesity, and RER. However, among women only ppVO2≤50% and VE/VCO2 slope>35 identify patients with 3-year mortality that is higher than HTx.

#5

TITLE: A POTENTIAL PARAMETER FOR ASSESSMENT OF EXERCISE CAPACITY IN PATIENTS WITH IDIOPATHIC PULMONARY DISEASE

AUTHORS: Ridvan Aktan, PhD[1]; Kemal Can Tertemiz, PhD[2]; Salih Yiğit, MD[2]; Sevgi Özalevli, PhD[3]; Aylin Özgen Alpaydin, PhD[2]; Eyüp Sabri Uçan, PhD[2].

Affiliations: [1]Department of Physiotherapy, Izmir University of Economics, Izmir, Turkey; [2]Department of Chest Diseases, Faculty of Medicine, Dokuz Eylül University, Izmir, Turkey; [3]Faculty of Physical Therapy and Rehabilitation, Dokuz Eylül University, Izmir, Turkey.

First author's contact: ridvanaktan@gmail.com

BACKGROUND: A 6-minute walk distance (6MWD) is widely used to assess functional exercise capacity in patients with cardiac or pulmonary disease and is known to hold strong prognostic utility. However, previous studies have shown that bodyweight negatively affects the predictive accuracy of the 6MWD. 6-minute walk work (6MWORK = 6MWD X bodyweight) has been shown to be more strongly associated with clinical markers in patients with chronic obstructive pulmonary disease (COPD), however, this has not been investigated in patients with idiopathic pulmonary fibrosis (IPF). This study aims to determine whether 6MWORK has a stronger correlation with clinical parameters compared to 6MWD in male patients with IPF. METHODS: Clinical data was retrospectively analyzed from 22 male patients with IPF. Linear correlations between lung function, 6MWORK and 6MWD were performed. RESULTS: There was a positive correlation between 6MWD and forced expiratory volume in the first second (FEV1) ($r=0.488$, $p=0.021$), while a strong positive correlation existed between 6MWORK and FEV1 ($r=0.558$, $p=0.007$). There was also a strong positive correlation between 6MWORK and FEV1 / forced vital capacity (FVC) ratio ($r=0.564$, $p=0.006$), while there was no correlation between 6MWD and FEV1/FVC ($r=0.320$, $p=0.146$). Moreover, when performing a linear regression analysis, the FEV1 ($\beta=0.411$, $p<0.033$) and FEV1/FVC ($\beta=0.420$, $p<0.030$) were significant unique contributors to 6MWORK. The model was statistically significant check(R-square=0.47, $F(2, 19)=8.31$, $p<0.003$). CONCLUSION: 6MWORK appears to be more closely associated with clinical parameters in male patients with IPF compared to 6MWD. 6MWORK may better characterize the clinical status of patients with IPF. Further study is needed to investigate the ability of 6MWORK to predict clinical endpoints.

#6

TITLE: ARE CHANGE IN METS DURING CARDIAC REHAB RELATED TO CHANGE IN PEAK VO2 AND 6MWD?

AUTHORS: Crystal Grimshaw MS[1]; Steven J. Keteyian, PhD[1]; Clinton A. Brawner, PhD, ACSM-CEP[1]

Affiliations: [1]Henry Ford Health, Detroit, MI

First author's contact: cgrimsh1@hfhs.org

BACKGROUND: Change in metabolic equivalents of task (METs) during exercise training is often used as a program outcome in cardiac rehabilitation (CR). The purpose of this study is to assess the correlation between the change in estimated exercise training METs during a CR program and the change in six-minute walk distance (6MWD) and change in peak oxygen uptake (VO2). METHODS: This is a secondary analysis of data from the iATTEND trial- a randomized controlled trial that compared facility based CR versus hybrid CR. Subjects included in this analysis had a history of myocardial infraction, coronary revascularization, heart failure, or valve surgery and completed ≥12 sessions of CR. METs during exercise training were estimated using ACSM treadmill equations from the average of the second, third and fourth sessions of CR and the final three sessions of CR. 6MWD and peak VO2 was derived from a symptom limited graded exercise treadmill test with gas exchange were collected at baseline before starting CR and within 14 days of completing CR. Pearson correlation coefficient was determined between change in estimated exercise training METs and both change in 6MWD and in peak VO2. RESULTS: The final cohort was n=237 (age=59±12 years; 35% women; 57% non-white race). The correlation between change in estimated exercise training METs and 6MWD was r=0.257, r=0.245, and r=0.235 among patients who completed ≥12 sessions of CR, ≥24 sessions of CR, and 36 sessions of CR, respectively. The correlation between change in estimated exercise training METs and peak VO2 was r=0.121, r=0.100, and r=0.136 among patients who completed ≥12 sessions of CR, ≥24 sessions of CR, and 36 sessions of CR, respectively. CONCLUSIONS: Although change in estimated exercise training METs during a CR program, change in 6MWD, and change in peak VO2 have each been used to describe change in exercise tolerance for program outcomes, the association between these variables is low (r= <0.3). This finding was independent regardless of the number of sessions completed. Further research is needed to better understand the relationship between the various methods of assessing change in exercise tolerance and program outcomes in CR.

#7

TITLE: THE EFFECTS OF HYBRID CARDIAC REHABILITATION USING SYNCHRONIZED TELEHEALTH ON PATIENT

AUTHORS: Steven J. Keteyian, PhD[1]; Crystal Grimshaw, MS[1]; Jonathan K. Ehrman, PhD[1]; Edward L. Peterson, PhD[1]; Abdul-Khaled Nour, MD[1]; David E. Lanfear, MD[1]; Clinton A. Brawner, PhD[1]

Affiliations: [1]SJK, Henry Ford Health, Detroit, MI

First author's contact: SKeteyi1@hfhs.org

BACKGROUND: Cardiac rehabilitation is effective for secondary prevention of cardiac events and is endorsed by consensus guidelines but is limited by low enrollment and completion rates. Non-traditional delivery models that facilitate participation in CR are needed. The improving ATTENDance (iATTEND) to CR trial is an open label, single-site trial that compared standard facility-based only CR (FBCR) to hybrid CR (HYCR = patient-individualized combination of virtual CR delivered via synchronized telehealth and up to 12 in-facility CR sessions). METHODS. Qualifying patients enrolling into early outpatient CR were consented and randomized 1:1 to HYCR (n=142) or FBCR (n=140). Primary outcome was total number of CR sessions completed within 6 mo. Secondary outcomes were percent of patients completing all 36 prescribed CR sessions and changes (after CR – before CR) in exercise capacity (peak oxygen uptake, VO2; 6-minute walk distance, 6MWD). Both attendance outcomes (alpha set at $p<0.05$) and both exercise capacity outcomes [examined using the TOST (two, one sided tests) equivalence test] were adjusted for relevant, pre-specified co-variates. RESULTS: Among patients enrolled into iATTEND (54% Black race, 33%; women, 34% > 65 yr), neither the total number of CR sessions completed per patient (28.7+11.8 vs 27.6+11.8 visits, adjusted $p = 0.41$) nor percent of patients completing 36 sessions (58.5+4.1 vs 50.7+4.2%, adjusted $p=0.32$) were different between HYCR and FBCR, respectively. After CR, changes in peak VO2 (mL.kg.-1min-1) were 2.3+2.8 vs 1.9+2.8 (HYCR and FBCR, respectively; adjusted $p=0.78$) and changes in 6MWD (m) were 46+46 vs 55+53 (HYCR and FBCR, respectively; adjusted $p=0.18$); TOST indicated equivalency ($p=.001$) between groups for both measures of change in exercise capacity. Across 7,735 total CR sessions, there was one major adverse event (non-fatal stroke within 3 hr after CR in HYCR) and no falls requiring medical attention. CONCLUSION. In a diverse cohort of patients that included understudied groups, our data suggest that HYCR is an effective non-traditional model to deliver CR. When compared to standard FBCR, HYCR results in similar patient attendance patterns and equivalent improvements in exercise capacity. (Funded by: National Heart, Lung, and Blood Institute)

#8

TITLE: EFFECTS OF A SINGLE EVENING VINYASA YOGA SESSION ON SLEEP IN ADULTS WITH INSOMNIA SYMPTOMS

AUTHORS: Caitlin A. Cheruka, PhD[1]; Sally A. Sherman, PhD[2]; Tyler D. Quinn, PhD[3]; Elizabeth G. Giordano[2]; Sophie M. Lebegern, BS[2]; H. Matthew Lehrer, PhD[2]; Daniel J. Buysse, MD[2]; Kelliann K. Davis, PhD[2]; Christopher E. Kline, PhD[2]

Affilitations: [1]University of Central Florida; [2]University of Pittsburgh, Pittsburgh PA; [3]West Virginia University, Morgantown, WV;

First author's contact: caitlin.cheruka@ucf.edu

BACKGROUND: Vinyasa yoga (VY), a form of yoga that links breath with movement and has higher energy expenditure perhaps than most other types of yoga, has been sparsely studied for its effects on sleep among adults with insomnia. It remains unknown whether and how an acute bout of VY performed in the evening impacts sleep and autonomic function. The purpose of this study it to examine the effects of an acute session of VY performed in the evening on sleep and nocturnal heart rate variability (HRV) in adults with insomnia symptoms. METHODS: 33 insufficiently active adults (84.8% female; 78.8% White; age=34.9±10.6 y; body mass index=28.9 kg/m2) with at least mild insomnia symptoms (Insomnia Severity Index ≥ 10) were randomized to either a single 60-min session of VY (n=17) or a quiet rest control condition (CON: n=16) occurring between 15:00 and 20:00 h. VY followed a pre-recorded practice and CON watched a nature documentary. On one night before and after the experimental session, participants wore a wrist accelerometer and a chest heart rate (HR) monitor overnight and completed a sleep diary. HRV was derived from the entire HR recording across the nocturnal period and standardized for sleep duration, with root mean square of successive differences (RMSSD) as the primary outcome. Analyses compared the changes from pre- to post-session between groups using linear mixed models and Cohen's d effect sizes. RESULTS: The change in actigraphy-assessed sleep efficiency (SE) and total sleep time (TST) did not differ from pre- to post-session for VY (SE: 88.9±1.4 to 88.9±1.5%; TST: 454.7±15.8 to 445.8±17.4 min) or CON (SE: 89.4±1.4 to 88.7±1.6%; TST: 401.3±16.3 vs. 407.3±17.3 min); group x time interactions were not statistically significant (each $p > 0.48$). The change in nocturnal RMSSD did not differ from pre- to post-session for either VY (39.5±6.8 to 38.7±6.0 ms) or CON (37.6±7.0 to 35.8±6.2 ms) and the group x time interaction was not statistically significant ($p=0.94$). CONCLUSION: An acute bout of VY performed in the early evening did not significantly change accelerometer- or diary-assessed sleep or impact parasympathetic tone during sleep. VY in the early evening is unlikely to benefit or impair sleep in adults with insomnia symptoms.

#9

TITLE: CLINICAL INTERNSHIP PROGRAM DEVELOPMENT IN AN ACADEMIC CARDIOPULMONARY EXERCISE LAB

AUTHORS: Sandra K. Knecht, MS, RCEP; Wayne A. Mays, MS; Jennah E. Goessling, MS; Courtney M. Booth, MS; Madalyn R. Franklin, BS; Caleb A.F. Parsons, MS; Andres A. Ortega, MS; Alexander R. Opotowsky, MD; Adam W. Powell, MD; Clifford Chin, MD

Affiliations:

First author's contact: sandy.knecht@cchmc.org

BACKGROUND: Programs in exercise physiology, exercise science, kinesiology, sports sciences, and human performance encompassing both undergraduate and graduate studies are increasingly popular, providing education for a growing career field. Preparing students for healthcare careers requires adequate exposure and hands-on learning using experiential internship and practicum opportunities. An initiative to formalize the exercise science academic requirements for university programs is already in place and requires institutional program CAAHEP accreditation by 2027. Participation in a clinical internship and the hours required vary among college programs. This retrospective study performed on the cardiopulmonary internship program at a large Midwest pediatric hospital provides insight to clinical education and research skill development for undergraduate and graduate exercise science students. METHODS: A retrospective review of program metrics and outcomes was analyzed regarding university affiliations with the internship program, number of students accepted into the internship program, completion rate, training and competencies, student academic level and associated culminating student presentations, and program satisfaction surveys for students completing their internship experience. RESULTS: Between 2012 to 2023, the program grew from 3 to 40 university affiliation agreements/ institutions. 143 students participated in the internship program: 32 fulfilled shadowing experiences, 90 were undergraduate interns and 21 were graduate interns. Internship hour requirements varied from 100 to 600 hours, with most students completing 350-450 hours. In 2012, the program enrolled 1 student per year, and by 2013 the capacity expanded to 4 student positions per semester (each spring, summer, fall). Internship students have presented 38 poster/ abstract presentations at regional conferences and seminars. Students achieved 99% completion of site-specific sign-off competencies in cardiopulmonary exercise testing, including expanded requirements for cardiac rehabilitation starting in 2018. 98% of the student interns completed the program. CONCLUSIONS: The cardiopulmonary internship program has continued to expand additional affiliate universities from both local and out of state institutions referring students to the pediatric internship program. Secondary to our cardiology program's growth to include pediatric and now adult congenital patients, our outreach sites, and the expansion into cardiac rehabilitation and exercise prescription, the lab team members and allocated space have increased to accommodate increasing patient volumes. This has led to the ability to increase student interns per semester and expand their preparation for transition into the healthcare workforce. Understanding of the skills and competencies obtained during the practicum experience may help to enhance academic curriculum to transition students into clinical opportunities.

#10

TITLE: MAXIMAL EXERCISE CAPACITY IS INVERSELY RELATED TO INCIDENT PERIPHERAL ARTERY DISEASE

AUTHORS: Jonathan K. Ehrman, PhD[1]; Steven J. Keteyian, PhD[1]; Herbert D. Aronow, MD[1]; Syed T. Ahsan, MD[1]; Michael J. Blaha, MD[2]; Mouaz H. Al-Mallah, MD[3]; Clinton A. Brawner, PhD[1]

Affiliations: [1]Division of Cardiovascular Medicine, Henry Ford Hospital, Detroit, MI; [2]Ciccarone Center for the Prevention of Heart Disease, John Hopkins Medicine, Lutherville, MD; [3]Houston Methodist DeBakey Heart & Vascular Center, Houston, TX

First author's contact: jehrman1@hfhs.org

BACKGROUND: Maximal exercise capacity (EC) is a strong, independent predictor of incident coronary and cerebrovascular disease. However, less is known about the relationship between EC and incident peripheral artery disease (PAD). Using data from the Henry Ford Exercise Testing (FIT) Project, we evaluated the relationship between EC and incident PAD. We hypothesized that EC, measured in metabolic equivalents of task (METs), is inversely related to incident PAD. METHODS: We assessed 41,268 patients (age= 55±12 yrs, 49% female, and 64% white) who completed a clinically indicated exercise stress test between January 1991 and June 2009 at a Henry Ford Health facility. Patients with established PAD at the time of testing were excluded. METs were estimated from peak treadmill speed and grade and standardized to the equivalent of a 50-year-old male to account for differences in absolute risk for a given MET level by age and sex. METs were categorized as <6, 6-9, 10-11, and >12. ICD9 codes 440.XX and 443.9 were used to identify first incidence of PAD from the test date through June 2010. Multivariable Cox regression was used to relate METs to incident PAD. Patients were censored at the date of death or last clinic visit. RESULTS: During a median follow-up of 7.1 years (IQR 4.2-11.1 yrs) there were 2,596 (6%) incident diagnoses of PAD. In the adjusted analysis, each 1 MET increase in maximal EC was associated with a 7% lower risk of PAD (aHR=0.93 [0.91, 0.94]). There was a graded, inverse risk of incident PAD by MET category (see Table). A significant interaction was noted for race (overall p=.04; white [HR=0.93 (0.92, 0.95)] vs black [HR=0.91 (0.88, 0.93)], p=.02; white vs other [HR=0.97 (0.87, 1.07)], p=0.47), but not for sex (p=.79). CONCLUSION: In a diverse cohort that completed a clinically indicated exercise stress test, higher EC measured in METs, is independently and inversely associated with a lower risk of incident PAD.

#11

TITLE: SAFETY AND EFFICACY OF SURGICAL PREHABILITATION IN CARDIOVASCULAR SURGERY PATIENTS

AUTHORS: Addie Critcher, MS, ACSM-CEP; Sara Weaver, BSN; Susan Sullivan, RD; Jeffrey Soukup, PhD, ACSM-CEP

Affiliations: Novant Health New Hanover Regional Medical Center, Wilmington, NC

First author's contact: aecritcher@hotmail.com

BACKGROUND: There are many complications that patients experience after cardiothoracic surgery, including prolonged intubation, increased length of ICU stay, infection, cardiovascular and muscular deconditioning and decreased quality of life. To reduce post-surgical complication risk, pre-surgical rehabilitation (Prehab) has developed as a potential countermeasure. Prehab may include exercise training, nutrition counseling, social support, patient and family education, smoking cessation and weight management. METHODS: Thirty-nine, high risk surgical patients scheduled for major cardiovascular surgery were referred to the Prehab program by their cardiovascular surgeon to prepare them for upcoming intervention. Each patient underwent pre- and post-assessments, to include a six-minute walk test (6MWT), hand grip dynamometry (GRIP), and 30-second chair stands (30SCS). Patients attended supervised exercise sessions twice weekly for at least 2 weeks leading up to their surgical procedure. The 60-minute session included symptom-limited aerobic and resistance training, along with education on nutrition and post-surgical expectations. Dependent samples t-tests were used to determine statistical significance for all pre-post comparison measures. RESULTS: Average program duration was 6.3 ± 3.3 wk, average number of sessions attended was 9.9 ± 5.7 sessions and the average number of sessions per week was 1.7 ± 0.3 sessions per week. Patients exercised for 27.1 ± 5.0 min with a mean exercise heart rate at 20.7 ± 12.4 bpm above rest. There were significant increases in 30SCS (pre = 9.5 ± 4.2 reps vs. post = 11.3 ± 4.5 reps), 6MWT (pre = 343.2 ± 117.9 m vs. post = 386.1 ± 96.9 m) and MET-min -1 (pre = 64.8 ± 27.5 MET-min -1 vs. post = 87.6 ± 7.3 MET-min -1). There were no changes in weight (pre = 87.5 ± 19.7 kg vs. post = 87.7 ± 19.3 kg), BMI (pre = 29.0 ± 6.2 kg·m 2 vs. post = 29.0 ± 6.0 kg·m 2), or GRIP (15.5 ± 6.7 kg vs. post = 17.8 ± 9.6 kg). Regarding safety, 385 exercise sessions were completed by all patients and 7 sessions were deferred by the staff for clinical reasons. In addition, of the 422.5 patient-hours of exercise, no untoward events occurred. CONCLUSION: Patients awaiting cardiovascular surgery can exercise safely at a low to moderate intensity and see improvements in functional capacity and muscular strength.

#12

TITLE: CLINICIAN-LEADERS IN CARDIAC REHABILITATION: CLINICAL EXERCISE PHYSIOLOGISTS

AUTHORS: Laura A. Richardson, PhD[1]; Robert Berry, MS[2]; Aaron W. Harding, PhD[3]; Jill Nustad, DSc[4]; Cemal Ozemek, PhD[5]; Patrick D. Savage, MS[6]; Ash Walker, DHSc[7]; Clinton A. Brawner, PhD[2]

Affiliations:
[1]School of Kinesiology, University of Michigan, Ann Arbor, Michigan; [2]Division of Cardiovascular Medicine, Henry Ford Hospital, Detroit, Michigan; [3]Oregon Heart & Vascular Institute, PeaceHealth, Springfield, Oregon; [4]Saint Gianna School of Health Sciences Exercise Physiology, University of Mary, Bismarck, North Dakota; [5]CO, Department of Physical Therapy, University of Illinois at Chicago, Chicago, Illinois; [6]Cardiac Rehabilitation, University of Vermont Medical Center, Burlington, Vermont; [7]University of North Carolina at Pembroke, Pembroke, North Carolina

First author's contact: laurari@umich.edu

BACKGROUND: Clinical exercise physiologists (CEP) are members of the multidisciplinary team in cardiac rehabilitation (CR). CEPs undertake multiple roles, including individualizing patient care to help restore or improve daily functioning in patients with heart disease. CEPs are equipped with a wide range of knowledge and skills for successful patient care and also have the skillset to propel career development to serve in leadership roles. The Million Hearts Cardiac Rehabilitation Collaborative (CRC) is working to achieve the goal of increasing enrollment to 70% CR participation in eligible patients. However, given the critical healthcare staffing shortage, the workforce poses a unique challenge to adequately staff clinics to improve access to CR, especially in historically marginalized rural and urban communities. PURPOSE: Describe the prevalence of CR programs that are solely staffed by CEPs and the job tasks they perform in the United States. METHODS: CR program managers in the United States were sent an email invitation to participate in an electronic survey from the American Association of Cardiovascular and Pulmonary Rehabilitation. Depending on the participant's responses, the final survey could be as few as 11 and up to 44 required multiple choice questions. RESULTS: Among 297 CR programs that responded to the survey, 86% (n= 256) stated they staff a CEP and 12% (n= 30) stated their program is run entirely by CEPs. Among the programs run entirely by CEPs, the minimum degree for CEP staff was a bachelor's in 93% (n= 28) and a master's in 7% (n= 2). The ACSM clinical exercise physiology credential was preferred or required in 73% (n= 22) of programs. Job tasks performed by CEPs in these CR programs were provided patient education (100%), monitored ECG during exercise (100%), assessed patient symptoms (100%), screened patients entering CR (100%), measured blood pressure via auscultation (97%), measured blood glucose (97%), and administered supplemental oxygen (93%). CEPs can hold a leadership position in 83% (n= 25) of these institutions. CONCLUSIONS: Leveraging the CEP practice patterns to serve as CR clinical leaders permits other health care professionals, such as nurses, to be used in other areas of health care. Although no formal framework exists on the educational preparation for a CEP career ladder, findings suggest that CEPs are competent to run and oversee CR programs. Innovative strategies to improve referral, enrollment, and retention of patients with heart disease into CR will require increases in CR capacity which can be filled by CEPs.

#13

TITLE: PATIENT-SPECIFIC ADAPTIVE DYNAMIC CYCLING IS ASSOCIATED WITH IMPROVED PD SYMPTOMS

AUTHORS: Brittany Smith, MS, ACSM-CEP; Younguk Kim, PhD, ACSM-EP; Lara Shigo, MA, ACSM-EP; Robert Melczak, MS; Angela Ridgel, PhD, ACSM-EP, FACSM

Affiliations: Kent State University, Exercise Science and Exercise Physiology, Kent, OH

First author's contact: bsmit258@kent.edu

BACKGROUND: High-cadence dynamic cycling is an effective therapy for improving motor symptoms in individuals with Parkinson's Disease (PD), as measured by the Unified Disease Parkinson's Rating Scale-Motor III (UPDRS-III). However, there is significant variability in individual responses to this therapy. Our lab developed a patient-specific adaptive dynamic cycling (PSADC) paradigm that manipulates entropy of cadence to optimize exercise prescriptions for individuals at various stages of disease progression. The purpose of this study is to evaluate the effectiveness of 12 sessions of PSADC on motor symptom improvement (UPDRS-III score) in individuals with PD. METHODS: Twenty-three individuals with idiopathic PD (were randomized into two groups: PSADC (n=13) or active control (n=10). All individuals completed 12 sessions (3 sessions per week for 4 weeks) of dynamic cycling on a SMART (Speed Manipulated Adaptive Rehabilitation Therapy) bicycle. Each session consisted of a 5-minute warm-up at 60 revolutions per minute (rpm), 30-minute exercise session (80 rpm), and 5-minute cool-down (60 rpm). Individuals in the PSADC group followed an adaptive exercise prescription in which resistance level was optimized on a weekly basis, based on the individual's entropy of cadence, and cycling effort. Individuals in the active control group remained at a constant resistance level for the entirety of the intervention. UPDRS-III was assessed in all participants prior to and following the 12-session intervention. Two-way analysis of variance (ANOVA) and paired samples t-tests were performed to detect statistical differences in UPDRS-III score between the groups. RESULTS: There was a significant group by time interaction ($F= 18.746$, $p <0.001$). The PSADC group showed a significant reduction (improvement) in UPDRS-III score (Pre: 32.8, Post: 27.5; $p<0.001$), while the active control group showed no significant change in UPDRS-III score (Pre: 28.2, Post: 32.4, $p=0.08$). CONCLUSIONS: 12 sessions of PSADC significantly improved UPDRS-III score, compared to non-adaptive high-cadence dynamic cycling. These results suggest that optimizing entropy of cadence is valuable for motor symptom improvement. Future studies will develop machine learning algorithms designed to predict appropriate clinical exercise prescriptions for individuals with PD.

#14

TITLE: OVERGROUND ROBOTIC EXOSKELETON GAIT TRAINING INTENSITY IN PATIENTS WITH SCI

AUTHORS: Katelyn D. Bosteder, MS[1]; Chad Elliott, MS[2]; Megan Mccorkle, MS[2]; Lindsey Wynne, DPT[3]; Jaime Gillespie, DPT[3]; Dannae Arnold, DPT[3]; Seema Sikka, MD[3]; Simon Driver, PhD[1]; Chad Swank, PhD[1]

Affiliations: [1]Baylor Scott & White Research Institute, Dallas, TX; [2]Baylor Scott & White Sports Therapy and Research Center, Frisco, TX; [3]Baylor Scott & White Institute for Rehabilitation, Dallas, TX;

First author's contact: katelyn.bosteder@bswhealth.org

BACKGROUND: High-intensity gait training during inpatient rehabilitation (IPR) promotes functional recovery following spinal cord injury (SCI) and may be achieved with overground robotic exoskeleton gait training (OEGT). Due to neuromuscular and autonomic impairments associated with SCI, assessing intensity through heart rate response and perceived exertion during gait training may be inaccurate. Wearable metabolic systems (WMS) have been used to directly measure intensity using oxygen consumption (VO2) with SCI. However, the use of WMS to assess OEGT intensity during OEGT in IPR is unexplored. PURPOSE: To describe the use of WMS to measure physiological intensity of OEGT in patients with motor incomplete SCI during IPR. METHODS: This observational study included adults aged 18 to 85 admitted to IPR with diagnosis of motor incomplete SCI who were eligible to initiate OEGT. OEGT intensity, duration, and step count were assessed during 1 OEGT session performed within 1 week of gait training initiation following IPR admission. Intensity was assessed by rate of perceived exertion (RPE) and VO2. VO2 was measured using a WMS worn during OEGT and expressed in metabolic equivalents (METs). Moderate and high intensity were defined as ≥ 3 and ≥ 6 METs, respectively, with 2.7 mL/min/kg of VO2 = 1 MET. RESULTS: 4 participants [3 males; 1 non-Hispanic white, 2 Hispanic white, 1 Black] were aged 52±8.4 years with a body mass index of 28.4±3.2. Participants' SCI characteristics were 3 diagnosed ASIA Impairment Scale (AIS) C, 1 AIS D; 2 tetraplegia and 2 paraplegia admitted within 30.5 [range=8-56] days after SCI. Duration of OEGT sessions (n=4) was 15:57 [range=10:23-19:43] minutes and participants completed 512 [287-761] steps. RPE was 4 [2-6], VO2 was 7.3 [3.05-15.6], and METs were 2.72 [1.1-5.8]. Three participants achieved ≥3 METs and ≥6 METs for 79-89.6% and 4.2-54.8% of the OEGT session, respectively. VO2 was highest in the AIS D participant. CONCLUSIONS: WMS use was demonstrated to feasibly obtain intensity data of OEGT in adults with SCI during IPR. Future research should consider the utility of WMS to assess the capacity of OEGT to promote high-intensity gait training in this population during IPR.

#15
TITLE: CUT-OFF VALUE FOR 30-SECOND SIT-TO-STAND TEST IN MYOCARDIAL INFARCTION

AUTHORS: Özge Ocaker Aktan, MSc[1]; Sevgi Özalevli, PhD[2]; Ahmet Anıl Başkurt, MD[3]; Hüseyin Dursun, PhD[3]; Aylin Özgen Alpaydin, PhD[4]; Dayimi Kaya, PhD[3].

Affiliations:
[1]Department of Physiotherapy and Rehabilitation, Institute of Health Sciences, Dokuz Eylül University, Izmir, Turkey; [2]Faculty of Physical Therapy and Rehabilitation, Dokuz Eylül University, Izmir, Turkey;
[3]Department of Cardiology, Faculty of Medicine, Dokuz Eylül University, Izmir, Turkey.
[4]Department of Chest Diseases, Faculty of Medicine, Dokuz Eylül University, Izmir, Turkey

First author's contact: ozgeocaker@gmail.com

BACKGROUND: Functional exercise capacity is closely associated with the health trajectory of patients who experienced a myocardial infarction (MI). In the absence of gold standard tests, practical approaches such as the 30-second sit-to-stand test (30 s-STST) could be used. This study aimed to identify a 30 s-STST cut-off value characterizing functional exercise capacity. METHODS: 22 MI patients were evaluated using the 6-minute walk test (6MWT) and 30 s-STST during the third day of their inpatient admission. Patients who covered <450 m in 6MWT were classified as "poor" exercise capacity, and patients who covered ≥450 m were classified as "good". Receiver operating characteristics (ROC) curve analysis was performed to investigate the 30 s-STST ability to accurately classify exercise capacity. The Youden index was used to determine the optimal cut-off value for the 30 s-STST. Area under the curve (AUC) was interpreted as follows: <0.5 – no discrimination, 0.5–0.69 poor discrimination, 0.7–0.79 acceptable discrimination, 0.8–0.89 excellent discrimination, ≥ 0.9 extraordinary discrimination. RESULTS: The optimal cut-off value was "12 repetitions" for 30 s-STST (sensitivity= 0.77; specificity= 0.67). Area under ROC curve was 0.77 ($p < 0.05$, %95 CI= [0.56 – 0.95]). Also, there was a significant correlation between 6MWT distance and 30 s-STST repetitions ($r = 0.46$; $p < 0.05$). CONCLUSION: In patients who survived an MI, performing less than 12 repetitions in 30 s-STST indicated impaired functional exercise capacity. This cut-off value could be useful in identifying individuals that may require focused interventions to increase functional capacity.

#16
TITLE: TOWARDS GROWTH-FOCUSED PHYSICAL ACTIVITY: QUALITATIVE EVALUATION OF A BETTER FUTURE

AUTHORS: Maggie Slavin, MS, ACSM-CPT

Affiliation: University of Pittsburgh, Pittsburgh, PA

First author's contact: mms231@pitt.edu

BACKGROUND: Physical activity promotion has traditionally centered on weight loss, contributing to harmful practices and missed opportunities to do good. This study emphasizes the multifaceted benefits of physical activity beyond weight loss. The objective is to provide evidence for a growth-focused approach that will hopefully encourage more successful referral networks between clinical practice and health fitness professionals. METHODS: Qualitative data were gathered through questionnaires from participants in 1:1 personal training and fitness classes. Questions included intended goals of participation, what they were able to accomplish, what aspects were most enjoyable and provided the greatest benefit, what may have exceeded their expectations, a single word to describe the experience, feedback about the instructor, and what they would tell someone who is considering participation. RESULTS: Qualitative findings revealed that participants responded positively to the growth-focused approach, expressing increased enjoyment and adherence to sustain physical activities. Social connections formed during group activities emerged as significant contributors to sustained engagement, along with the instructor's support and structure throughout the process. Data showed improvements in overall mental well-being, reductions in stress levels, increased fitness knowledge, self-efficacy, adherence, strength, conditioning, and mobility. CONCLUSIONS: This study advocates for a shift in physical activity promotion, moving away from a weight-centric model towards a growth-focused approach. The positive reception and sustained engagement observed among participants suggest that emphasizing well-being, mental health, social connections, and overall growth can be effective in encouraging regular physical activity. This approach has the potential to contribute to a more positive and sustainable health and fitness culture. Future interventions and public health campaigns should encourage continued collaboration between clinical practice and health fitness professionals.

#17

TITLE: VALIDATION OF A NEURO-FITNESS DEVICE TO ASSESS COGNITIVE MEASURES: A PILOT STUDY

AUTHORS: Thinh Huynh BA[1]; Christian Yabut BA[1]; Chonnor Ludolph BA[1]; Colby Hall BA[1]; C.Brendan Clark PhD[1]; Heidi A. VanRavenhorst-Bell PhD[1]

Affiliations: [1]Wichita State University, Wichita, KS

First author's contact: thinhhuynh316@gmail.com

BACKGROUND: A new portable neurocognitive training tool that administers central and peripheral visual and cognitive drills using a 7-foot-wide touchscreen light-board technology is being introduced into the sport and therapy fields. The purpose of this study is to assess the validity of the Reflexion Edge cognitive assessments compared to the FDA-cleared, ImPACT Computer-based test and Sway Medical App assessment. METHODS: 22 healthy adults, 19-66 yrs, M = 23.54 + SD = 9.81, 54% male, have participated, however the target enrollment is 100 participants. Participants completed one each of Reflexion Edge assessment using a 7-ft by 3-ft touchscreen light-board, ImPACT test using a laptop, and Sway assessment using an iPhone. RESULTS: Spearman's Rho correlational analyses were administered to determine the relationship between the Reflexion Edge scales and the ImPACT computer-based and Sway Medical app scales. Findings showed Reflexion Edge scales demonstrated significant correlations with multiple ImPACT and Sway Choice Reaction Time & Speed Processing scales, $r = +0.448$ to 0.660, $p's < 0.05$; ImPACT Attention & Memory scales, $r = +0.425$ to 0.813, $p's < 0.05$; and Sway Executive Function scales, $r = +0.424$ to 0.776, $p's < 0.05$. All analysis were conducted at an α of 0.05. CONCLUSIONS: Despite a lack of statistical power, the Reflexion Edge cognitive measures demonstrated significant associations with several of the ImPACT computer-based and the Sway Medical app cognitive assessment measures. In addition, the correlational effect size (+ 0.362 to + 0.421) of several of the other Reflexion Edge scales suggested promising associations with the ImPACT and Sway app scales. The continuation of this study to increase the N and determine significant relevance is supported. In conclusion, Reflexion Edge may serve as a viable cognitive assessment tool based on its comparable association with established ImPACT Computer-based and SWAY Medical app assessments.

#18

TITLE: EFFECTS OF CARDIO VS. CARDIO AND RESISTANCE TRAINING IN PEOPLE WITH OBESITY

AUTHORS: Emily J. Parker, MS, ACSM-CEP[1]; Korie M. Riely, BS[1]; Sydney Ellingson, MS, ACSM-CEP[1]; Cali J. Modglin, MS, ACSM-EP[1]; Henry Lang, PhD[1]

Affiliations: [1]University of Mary, Bismarck, ND

First author's contact: ejtyrrell@umary.edu

BACKGROUND: Current ACSM guidelines for people with obesity suggest cardiovascular training of up to 300 minutes of moderate to vigorous physical activity per week with little focus on resistance training. PURPOSE: The purpose of this study was to explore the effects of 10-weeks of cardiovascular only (CO) vs. cardiovascular and resistance training (CRT) on metabolic health and health-related quality of life (HRQOL) among people with obesity. METHODS: Four male and 14 female participants with a BMI of 30 to 40 kg/m2 were randomly assigned to either CO (9) or CRT (9) groups. Participants were verbally administered the CDC HRQOL-14 and completed other assessments, including systolic blood pressure (SBP), diastolic blood pressure (DBP), waist-to-hip ratio (WHR), fasting blood glucose, homeostatic model assessment for insulin resistance (HOMA-IR), resting energy expenditure, and body fat percentage before beginning and after completing the exercise program. Both groups exercised for 1 hour, 4 days a week, for 10 weeks. CO completed 225 minutes of moderate-intensity cardio for weeks 1-2 and progressed to 177 minutes of moderate and 48 minutes of vigorous-intensity cardio for weeks 3-10. CRT completed 150 minutes of moderate-intensity cardio training and 1 hour of RT for the first two weeks and progressed to 48 minutes of moderate and 48 minutes of vigorous-intensity cardio along with 130 minutes of RT for weeks 3-10. Paired samples t-tests were used to compare pre-and post-intervention variables within groups. One-way ANOVAs were used to compare groups at baseline and the change from pre- to post-intervention for each variable between groups. RESULTS: Of the 18 participants, 100% completed the study. There were no significant differences between groups at baseline. The CRT group had a significant reduction from baseline to post-intervention for SBP (-8.8±10.6mmHg, $p<.05$) and a significant increase for log adjusted 5-RM (0.7±0.01kg, $p<.001$). BMI ($\bar{x}$= -0.8±1.0, $p=.060$), body weight ($\bar{x}$= -5.7±7.7, $p=.057$), and %BF ($\bar{x}$= -1.8±2.5, $p=.059$) decreased in the CRT group trending towards significance. The CO group had significant reductions from baseline to post-intervention in DBP (-7.3±7.6mmHg, $p<.05$), bodyweight (-7.4±5.3lbs, $p<.05$), BMI (-1.2±0.9 kg/m2, $p<.05$) and body fat percentage (-2.8±2.5%, $p<.05$). The only significant difference in change variables between groups was log-adjusted 5-RM ($p<.001$). CONCLUSIONS: Ten weeks of CO or CRT improve markers of metabolic health. Combing cardiovascular and resistance training may improve SBP and muscle strength to a greater extent than cardiovascular training alone, while cardiovascular training may have a greater impact on body weight and body fat percentage.

#19

TITLE: BODY COMPOSITION USING DXA VERSUS BIA IN A MIXED COHORT OF COLLEGE STUDENTS

AUTHORS: Alicia M. Anderson; Toni D. Uhrich, MS; Paula E. Papanek, PhD

Affiliations: Marquette University, Milwaukee WI

First author's contact: alicia.anderson@marquette.edu

BACKGROUND: Body composition assessment is an important clinical and research tool. Dual energy x-ray absorptiometry (DXA) is the 'gold standard' and useful in the research environment, however, it is expensive, reliant on a trained technician, requires a large space, and is immoveable. Bioelectrical impedance (BIA) measurements have improved with the application of 8-electrode multifrequency units and could offer faster, cheaper, and portable alternative if measurements are comparable. The purpose of this study was to determine how well bone mineral content (BMC), lean body mass (LBM), and fat mass measurements made with BIA compared to those made with DXA. METHODS: 46 (36 female) college students [avg 21.2 yr, 167.2 cm, 67.2 kg, 28.9% fat; 6 Asian, 4 Hispanic, 3 Black] had their BIA and DXA whole body composition measured within minutes of each other. Three compartments were compared BIA vs DXA: BMC, fat mass, and LBM. Pearson's correlation coefficients were determined. RESULTS: Absolute fat mass (r=0.95), lean mass (r=0.98), and BMC (r=0.91) were highly correlated between the assessment methods. CONCLUSIONS: A quadripolar multifrequency BIA device can be a valid body composition surrogate in research environments using college students when a DXA machine is impractical to use.

#20

TITLE:A NON-MOTORIZED TREADMILL VALIDATED FOR THE TRADITIONAL OVERGROUND 6-MIN WALK TEST

AUTHORS: Lauren E Opielinski, MS; Toni D Uhrich, MS; Kamryn M Kroner, MS; Sarah V Lessila, MS; Paula E Papanek, PhD

Affiliations: Marquette University, Milwaukee, WI

First author's contact: lauren.opielinski@marquette.edu

BACKGROUND: The six-minute walk test (6MWT) is a commonly used clinical and research test to assess aerobic capacity. However, in many settings, the 30-m corridor required to conduct the test may not be available. Evaluation of the use of a non-motorized treadmill as an alternative method has not been well studied. PURPOSE: This study compared the distances walked during the traditional (TRAD) 6MWT on a flat indoor surface to a non-motorized treadmill (NMT) to validate the use of the NMT as an alternative testing method. METHODS: A total of 55 healthy adults (28 females) completed the TRAD 6MWT and NMT 6MWT during the same testing session (randomized order). The levels of agreement between the two methods were quantified using Lin's concordance correlation coefficients. Additionally, a multiple linear regression was developed to predict TRAD 6MWT distance with covariates age, sex, and body mass index (BMI) from NMT distance walked. RESULTS: The average TRAD distance walked was 630 m and the average NMT distance walked was 607 m. The mean difference of 23 m between the two methods was nonsignificant. There was good agreement between methods ($rc = 0.84$) showing no differences. A multiple linear regression was developed and revealed that NMT distance significantly predicted TRAD distance when controlling for age, sex, height, and weight (Standardized Beta = 0.791, $p < 0.001$). CONCLUSION: The use of the NMT for 6MWT was deemed a valid and feasible replacement for the TRAD 6MWT based on the results of this study.