Abstracts

Preconference Session 1

PC101: THE VALUE OF ACSM MEMBERSHIP AND CERTIFICATION: PERSPECTIVES FROM CERTIFIED PROFESSIONALS

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The purpose of this tutorial is to highlight the value of and advocate for SEACSM/ACSM membership and ACSM certification, educate current students about career paths as certified practitioners, support alumni engagement with SEACSM/ACSM, and enhance member recruitment and retention. The panelists include ACSM Certified Exercise Physiologists and Clinical Exercise Physiologists who will describe the work they do and the benefits of ACSM membership and certification. This tutorial session will provide opportunities for networking and mentoring. The learning objectives are to 1) educate undergraduate and graduate students about the mission, goals, certifications, and professions related to ACSM and 2) to educate attendees about the benefits of hiring and working with ACSM certified professionals. The target audience includes undergraduate and graduate students, faculty and professionals.

Preconference Session 2

PC201: DIFFERENT EXERCISE MODALITIES AND CARDIOVASCULAR HEALTH IN OLDER ADULTS WITH INTELLECTUAL DISABILITIES: PRELIMINARY RESULTS

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BACKGROUND: Cardiovascular diseases are highly prevalent among older adults (OA) with intellectual disability (ID), who often have poorer physical fitness compared to their non-ID peers. The purpose of this study was to determine and compare the effects of two exercise programs—continuous aerobic training (CAT) and sprint interval training (SIT)—on carotid intima-media thickness (cIMT) and aerobic capacity in OA with ID. METHODS: 56 OA (49.5±7.71 Y.O.) with mild-moderate ID were randomly allocated to the CAT (n=16), SIT (n=20) and control (CG; n=20) groups. Intervention groups followed a multicomponent exercise program for 6 months, 3 times/week (72 sessions), 90 min each session. Systolic (SBP) and diastolic blood pressure (DBP) were measured. Carotid intima-media thickness (cIMT) was measured using edge-detection software (Quipu, Pisa, Italy) and an ultrasound system (Vivid 2, GE Medical Systems, Chicago, IL). VO_2 and power were assessed by using a precalibrated cycle ergometer (Excalibur, Lode, Groningen, the Netherlands) and an automatic gas analysis system (Metasys TR-plus, Brainware SA, La Valette, France). A one-way ANOVA was used to compare the characteristics of the groups. Repeated-measures ANOVA was used to assess the intervention effect ($\alpha<0.05$) (IRB# CER URL 2017_2018_008). RESULTS: Peak VO_2 improved significantly in the CAT (19.4±4.8 vs 23.28±7.0 ml/kg/min; $p<0.001$) and SIT (19.2±3.4 vs 25.8±4.5 ml/kg/min; $p<0.001$) groups. At the end of the intervention, there were significant differences among the active groups and the CG (CAT, $p=0.001$; SIT, $p<0.001$). The peak power increased significantly in both active groups (CAT=117.5±23 vs 135.8±36.3 watts, $p=0.002$; SIT=112.5±40.2 vs 149±40.1 watts; $p<0.001$) and was significantly higher than the results obtained by the CG (all $p<0.01$). The CAT group significantly improved the SBP after the intervention (122.8±15.6 vs 115.7 mmHg; $p=0.009$). Significant differences were observed in cIMT pre/post values for the SIT group ($p=0.046$). CONCLUSIONS: The results showed that both programs (SIT and CAT) can improve cardiovascular and cardiorespiratory outcomes in OA with ID. It is essential to integrate these programs into the care and management of this population to reduce cardiovascular risk and enhance health outcomes.

PC202: RESTING METABOLIC RATE IN PRE-MENOPAUSAL AFRICAN AMERICAN WOMEN: EVALUATION OF COMMONLY AVAILABLE PREDICTION EQUATIONS

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BACKGROUND: Resting metabolic rate (RMR) is a key factor in total daily energy expenditure (TDEE). While indirect calorimetry (IC) is the preferred method for measuring RMR, it is costly and burdensome for participants, leading to the development of prediction equations. This study evaluated the accuracy of common RMR prediction equations in pre-menopausal African-American women aged 18-40. **METHODS:** RMR was measured in 91 pre-menopausal African American women (18-40 yrs) using IC with a respiratory canopy (TrueOne 2400, ParvoMedics). Weight, height, and body composition (via BOD POD and bioelectrical impedance analysis) were used to predict RMR with 10 equations: Mifflin St-Jeor, Harris-Benedict (HB), Cunningham, WHO, Owen, University of Memphis (UM), Wells-Valliant, University of Kansas, and Nelson. Predictive accuracy was assessed for each equation. **RESULTS:** The participants had a mean age of 25.2±7.4 yrs, with BMI ranging from 17.3 to 48.9 kg/m² (mean: 27.9±6.1). Measured RMR averaged 1338±216 kcals/day. Paired t-tests showed significant differences ($p<.004$) between measured and predicted RMR for all equations. The HB equation underestimated RMR by 432±167 kcal/day, while the other equations overestimated RMR by 42-401 kcal/day. The Owen and UM equations were the most accurate, with predicted values within ±10% of measured RMR for 59.3% and 53.8% of participants, respectively. **CONCLUSIONS:** The inaccuracy of current RMR prediction equations highlights the need for race-specific models. Overestimation of RMR may lead to lower energy deficits and less effective weight loss interventions in African-American women.

PC203: BODY FAT, VISCERAL FAT AREA AND SKELETAL MASS WITH MEETING NATIONAL GUIDELINES FOR MUSCULAR STRENGTHENING

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According to national guidelines (United States) for muscular strengthening, adults should perform muscle-strengthening activities with all major muscle groups on 2 or more days, it is not well known the impact on body fat, visceral fat area and skeletal muscle mass. **PURPOSE:** This study compared adults that met national muscular conditioning guidelines to those that did not meet guidelines in body fat percentage (BF%), visceral fat area and skeletal muscle mass. **METHODS:** A total of 79 participants from the military healthcare system (n=36 males, 41.6±14.5yrs, n=43 females 43.6±15.2yrs) were measured. A 7-day physical activity recall (PAR)was used to measure muscular conditioning activities. BF%, visceral fat area and skeletal muscle mass was estimated via multi-segmental bioelectrical impedance body fat analyzer to identify the difference between groups using an independent t-test ($p<.05$). **RESULTS:** Males who met muscular conditioning guidelines (n=22) displayed significant lower mean BF% (17.8±6.7) and visceral fat area (65.6cm²±35.8cm²) compared to males who did not met guidelines (n=14) with BF% (24.1±5.8) and visceral fat area (89.1 cm²±35.6 cm²) ($p<.05$). Females who met muscular conditioning guidelines (n=21) displayed significant lower mean BF% (30.2±7.9) compared to females who did not met guidelines (n=22) with BF% (35.7±7.1). There was no significant difference in skeletal mass in both groups for both sexes. **CONCLUSION:** Both males and females that met national muscular strengthening guidelines had significant lower body fat percentages compared to those that did not meet muscular conditioning guidelines. Males who meet guidelines also had significantly lower visceral fat area than those that did not meet guidelines. **SIGNIFICANCE/NOVELTY:**

This study is the first to our knowledge to analyze body composition variables (BF%, visceral fat area and skeletal muscle mass) and meeting the national muscular conditioning guidelines. There are no grants to declare. The authors declare no conflicts of interest 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.

PC204: IDENTIFICATION AND INTERPRETATION OF VENTILATORY THRESHOLD IN STRUCTURAL FIREFIGHTERS

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BACKGROUND: A firefighter's self-contained breathing apparatus (SCBA) is rated for a finite duration when breathing at a rate of 40 L/min. Several firefighting tasks are highly aerobic and can elicit an oxygen uptake (VO_2) up to 41.5 mL/kg/min. Work capacity is ultimately limited by how quickly a firefighter depletes the SCBA, suggesting ventilatory threshold (VT) may be a meaningful indicator of occupational performance. The purpose of this study was to determine mean VT in a cohort of firefighters and interpret these findings as they relate to occupational performance. METHODS: Structural firefighters (n = 37, age: 31 ± 10, body mass index (BMI): 29.1 ± 6.0 kg/m^2) completed the Wellness Fitness Initiative's treadmill protocol to volitional failure while a metabolic cart analyzed breath-by-breath gas exchange. VT was calculated using the V-slope method and was used to determine the VO_2 at VT. Furthermore, minute ventilation (VE) at VT was identified for each subject. Descriptive data were reported as means ± SD and range. Correlations were performed to determine the relationship between age and anthropometrics and VT. RESULTS: The group mean VO_{2peak} and VT were 39.9 ± 8.6 mL/kg/min (range: 19.16 - 59.6) and 26.0 ± 7.0 mL/kg/min (range: 11.7 - 41.1), respectively. On average, VT occurred at 65 ± 10% of VO_{2peak}. As expected, VT and VO_{2peak} were highly correlated (r = 0.82, p < 0.001). VE at VT was 50.2 ± 13.7 L/min (range: 28.5 - 77.4), and nine firefighters had a VE of <40 L/min at VT. Absolute VO_2 (L/min) at VT was not related to age (r = -0.018, p = 0.92), height (r = 0.23, p = 0.18), body mass (r = 0.12, p = 0.50), or BMI (r = 0.03. p = 0.85). CONCLUSIONS: Firefighters demonstrated large variability in VT, which may translate to differences in air consumption rates during occupational tasks. Furthermore, numerous job tasks would require firefighters to operate at intensities exceeding VT, which could impair performance by reducing work capacity. Several firefighters exceeded the rated ventilatory rate for SCBA while working below VT. Firefighters interested in extending the functional duration of an SCBA may benefit from training focused on improving both VO_{2peak} and VT. Neither age nor anthropometric characteristics were related to VT, necessitating further research investigating relationships between additional fitness measures.

PC205: THE MENSTRUAL CYCLE INFLUENCES SKELETAL MUSCLE OXYGENATION DURING RECOVERY FOLLOWING HIGH-INTENSITY INTERVAL TRAINING

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BACKGROUND: The menstrual cycle (MC) is composed of low-hormone (LHP) and high-hormone (HHP) phases which may influence exercise performance and recovery by altering skeletal muscle oxygen levels. High-intensity interval training (HIIT) places significant demands on skeletal muscle oxygenation, a key factor in sustaining performance and delaying fatigue. The objective of this study was to assess the impact of the MC on skeletal muscle oxygenation at rest, during HIIT, and recovery from HIIT exercise in females. **METHODS:** Thirty-five recreationally active females (Age: 24±6 years; BMI: 23.5±2.5 kg/m²) completed a $HIIT_{1:1}$ protocol (10×60s/60s) in both the LHP and HHP. Females included in this analysis were eumenorrheic (EUM), taking monophasic oral contraceptive users (OC), or using either a copper or hormonal intrauterine devices (IUD). Near-infrared spectroscopy (NIRS) was used to assess total hemoglobin (THb) at rest and at 10 minutes post HIIT. Further, THb desaturation and resaturation rates were measured with NIRS during each of the ten bouts of HIIT exercise. The main effects of MC (LHP, HHP), time (rest, during HIIT, recovery), and their interaction on THb were assessed using repeated measures ANOVA, with post hoc Bonferroni adjustments (α=0.05). **RESULTS:** At rest, there were no significant differences between HHP compared to LHP (mean difference ± standard error [MD ± SE; LHP-HHP]: 1.17±1.77 a.u.; MC: p=0.52). During exercise, no differences in THb desaturation (MD ± SE: 0.21±0.49 a.u.; MC p=0.28) or resaturation (-0.09±0.35 a.u.; MC p=0.97) were observed between MC phases. In recovery, THb was lower in the HHP compared to the LHP (MD ± SE 1.47±0.72 a.u.; MC p=0.05). **CONCLUSIONS:** Hormonal fluctuations during the HHP may impair skeletal muscle oxygenation during recovery from HIIT, with no differences during exercise or at rest. The lack of oxygenation differences during HIIT between MC phases suggests that muscle performance and oxygen delivery may remain stable during high-intensity exercise, despite hormone fluctuations. These findings suggest consideration for extended recovery or enhanced recovery protocols but no change in exercise strategies during the HHP. **Grant or Funding information**: No external funding was used for the collection of these data.

PC206: STAND UP TO OBESITY: INTERRUPTING SEDENTARY BEHAVIOR IS ASSOCIATED WITH LOWER TOTAL AND TRUNK FAT

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BACKGROUND: Cardiometabolic disease (CMD) remains a leading cause of mortality. Sedentary behavior (SB), such as sitting, is positively associated with central obesity, which is a major risk factor for CMD. Emerging observational evidence suggests that a higher frequency of sedentary behavior interruptions (SBI), such as regularly breaking up sitting, may be linked to lower levels of total and trunk fat. However, previous research has employed methods with high bias in estimating SBI and body fat distribution. Consequently, the aim of this study was to examine the relationships between SBI, measured via activPAL, and total and trunk fat, measured using dual-energy X-ray absorptiometry (DXA). METHODS: This cross-sectional analysis was conducted as part of an ongoing study (target *N*=500). College-based young adults (CBYA; *N*=291, mean ± SD age 20.2 ± 1.6 years, 70% female, 60% White) attended a laboratory visit where total body fat and trunk fat percentages were assessed using whole-body DXA. Participants then wore a thigh-mounted activPAL4 for seven days to measure SBI, operationalized as the average number of sit-to-stand transitions per day. Separate linear regression models, adjusted for *a priori*-determined covariates (age, sex, race, activPAL wear time, moderate-to-vigorous physical activity [MVPA] time, and total SB time), were used to examine the relationships between SBI and total and trunk body fat. Unstandardized beta (β) values indicate the estimated change in fat percentage for each additional interruption. RESULTS: The mean ± SD total body fat was 28.6 ± 7.7%, and trunk fat was 25.6 ± 8.3%. Participants averaged 47 ± 13 SBI per day, 7.4 ± 1.9 hours/day of total SB, and 37.1 ± 22.5 minutes/day of MVPA. A higher number of daily SBI was significantly associated with lower total body fat (β = -0.11%, 95% CI = -0.17 to -0.06, p < .001) and trunk fat (β = -0.11%, 95% CI = -0.16 to -0.07, p < .001). CONCLUSIONS: These preliminary data suggest that an additional 10 SBI per day is associated with a 1.1% estimated reduction in total and trunk body fat, indicating potential benefits for mitigating CMD risk in CBYA. To validate SBI as an effective intervention for improving body fat distribution, randomized controlled trials should be conducted in populations at high risk for CMD, where SBI could have a greater impact.

PC207: LIFESTYLE MEDICINE ASSESSMENT FOR FAMILY MEDICINE PROVIDERS

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BACKGROUND: The American Academy of Family Physicians Lifestyle Medicine Assessment (LMA) tool analyzes five domains of lifestyle medicine: recovery (combining sleep and stress), movement, connection, nutrition, and substance use. The purpose of these studies was to establish the correlations among the five domains for a group of primary care providers. METHODS: Participants were 35 Mayo Clinic Family Medicine Providers. These included 11 female Advanced Practice Providers (APPs) and 24 physicians (nine males and fifteen

females.) Participants completed the LMA survey of five 10-point sections (the maximum score was 50 points). Pearson correlation was used to determine the strength of correlations (r-score) among the five domains. RESULTS: The mean Lifestyle Score was 34.57± 6.19 which is categorized as "very good" according to the LMA guidelines for this survey. The mean scores for each domain were: 1) recovery 4.71±2.91; 2) movement 6.26±2.94; 3) nutrition 7.41±2.00; 4) connection 6.94±2.16; and 5) substance use 9.35±1.28. Comparisons were made between each domain to determine the ten possible correlations: 1) recovery vs. movement (r=0.26); 2) recovery vs. connection (r=0.34); 3) recovery vs. nutrition (r=0.06); 4) recovery vs. substance use (r=0.05); 5) movement vs. connection (r=0.07); 6) movement vs. nutrition (r=0.09); 7) movement vs. substance use (r=0.17); 8) connection vs. nutrition (r=0.20); 9) connection vs. substance use (r=0.13); and 10) nutrition vs. substance use (r=0.05). CONCLUSION: The correlations among the five domains were weak (≤0.34). This implies that individuals tend to excel in some domains and perform poorly in others, with no discernible relationship between the domains. Patterns appear to be unique for each individual. Grant or funding information: part of Mayo Clinic Pounds Grant Generative AI statement: No AI Contributions.

PC208: ATHLETIC TRAINER AND SCHOOL NURSE NALOXONE ACCESS IN SOUTH CAROLINA SCHOOLS

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BACKGROUND: Professional associations for school-based nurses and athletic trainers recommend having access to naloxone for opioid related overdoses in schools. We aimed to evaluate access to naloxone of school-based professionals responsible for caring for athletes, and the knowledge of these professionals regarding naloxone treatment and policy. METHODS: A single electronic survey was distributed via email to school-based professionals (nurses, teachers, athletic trainers, and athletic staff) through employers or professional societies within South Carolina. Data was collected and stored in a RedCAP database, from which comparative statistics were calculated using RedCAP built in software. RESULTS: A total of 228 respondents participated in the survey, nearly all from a single county. 25.7% were nurses, 38.3% teachers, 3.0% as athletic trainers, 3.0% as athletic staff, and 30% identified as "Other". 91.7% reported never administering naloxone. 59.6% reported never receiving training about naloxone administration in the past. Respondents' comfort with recognizing opioid overdoses, administering naloxone, and their knowledge or naloxone and opioid overdoses varied. However, there was strong consensus that there should be training on naloxone administration and recognizing opioid overdose (93.0% Agree or Strongly Agree). There was mixed consensus on if athletic trainers or coaches should carry naloxone (26.5% Disagree, 69.2% Agree or Strongly Agree). It was generally agreed that nurses should have access to naloxone, but this consensus did not carry over to teachers (68.8% Disagree or Strongly Disagree, 35.2% Agree or Strongly Agree).CONCLUSIONS: Although the survey results only reflect the input from respondents in a single county, within that county there is a desire to expand education about use of naloxone, opioid overdose recognition, and to increase access to naloxone. There is some division in how naloxone should be accessed and who should have access to it. There may be benefit in implementing formal training on naloxone use and recognizing opioid overdose. There is also need for further investigation into the levels of comfort and knowledge around naloxone and opioid overdose amongst staff in other parts of the state.

Student Award Poster Competition

D01: VALIDATION OF THE GARMIN FORERUNNER 265 TO ESTIMATE VO2MAX AND PREDICT HALF-MARATHON RACE PERFORMANCE

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BACKGROUND: Advances in fitness tracker technology have led to increased measurements and predictions of physiological variables that allow devices to provide increasingly sophisticated information to users such as VO_2max and race prediction times. These data can help develop personalized exercise programs and race strategies. Validity evidence of wrist based fitness trackers to estimate VO_2max has been mixed due to changes in technology and heartrate measurements, and studies have not yet investigated race performance prediction. It was hypothesized that Garmin watches would provide valid estimates of VO_2max and race prediction times with validity improving with 12 weeks of continuous use. METHODS: Twenty subjects participated in 12 weeks of half marathon training, wore a Garmin watch for the duration of the training program, and ran a half marathon race. Before the training program, subjects completed a VO_2max test on a treadmill and two 10 minute outdoor runs while wearing a Garmin Forerunner 265. Upon completion of the training program, subjects competed in a half marathon and, 7-14 days later, completed a second VO_2max test. Garmin watch estimates of VO_2max and race performance predictions were compared to criterion measures using paired samples t-test and by calculating mean absolute percent error (MAPE). Significance was set at $p < 0.05$. RESULTS: The initial mean VO_2max estimate from Garmin (43.95 ± 7.99 ml/kg/min) was significantly higher compared to the criterion max test (41.10 ± 8.02 ml/kg/min), $t = 2.92$ $p = .009$. After 12 weeks of training, estimated VO_2max from Garmin (45 ± 7.21 ml/kg/min) was also significantly higher than the criterion (42.43 ± 8.54 ml/kg/min), $t = 3.05$ $p = .007$. Garmin's race prediction for the half marathon (129.97 ± 18.29 min) was significantly faster than the official race completion time (137.55 ± 21.03 min), $t = -3.55$ $p = .003$. Despite this, MAPE of VO_2max and race prediction were below 10%, an acceptable threshold set by the Consumer Technology Association (CTA). CONCLUSION: The Garmin Forerunner 265 significantly overestimated VO_2max after 1 exercise session and after 12 weeks of use. It also predicted a race time that was significantly faster than the actual race time. However, from a consumer perspective based on CTA standards, the device may be considered an adequate tool for runners.

D02: THE EFFECT OF PITCH COUNT ON ELBOW AND SHOULDER KINETICS DURING DIVISION I BASEBALL GAMES

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BACKGROUND: Baseball pitchers experience elbow and shoulder injuries at high rates. Pitch count is believed to play a role in contributing to injury risk; however, prior biomechanical analyses of simulated games were limited to laboratory settings. The purpose of this study was to compare elbow varus torque (EVT), shoulder resultant force, and pitch velocity as pitch count increased during Division I collegiate baseball games. **METHODS:** Sixteen Division I pitchers (1.9±.1m; 94.3±11.9kg) with at least 90 pitches thrown in a competitive game were included. Kinetics were calculated using kinematics recorded from a markerless motion capture system (300Hz). Pitch type and velocity were recorded using a TrackMan V3 Game Tracking unit. For each pitcher, pitches were grouped into five buckets (1-30, 31-45, 46-60, 61-75, 76-90), and fastballs from each bucket were averaged to create one representative pitch for each bucket. A repeated measures multivariate analysis of variance (MANOVA) was used to assess changes in elbow and shoulder kinetics between pitch buckets. A repeated measures ANOVA was used to assess changes in ball velocity. **RESULTS:** Across pitch buckets, mean values of peak EVT and shoulder resultant force ranged from 125-128Nm and 1373-1384N, respectively. Mean fastball velocity ranged from 90.7-91.7MPH. The MANOVA revealed no significant effect of pitch count on elbow and shoulder kinetics ($F_{8,118}$=.669). However, the ANOVA found a significant effect of pitch count on ball velocity ($F_{4,60}$=4.657, p=.002). Pairwise comparisons showed that pitch velocity in the 1-30 pitch bucket was significantly faster than the 76-90 pitch bucket (mean ± SD difference: 1.1±1.0MPH). All other post hoc tests were not significant ($p > .06$). **CONCLUSION:** Collegiate pitchers did not experience a significant change in elbow or shoulder kinetics when throwing up to 90 pitches. However, a notable decrease in ball velocity was observed during pitches 76 to 90. This study provides evidence that collegiate pitchers maintain similar loading on their upper extremities throughout a game, but their corresponding drop in velocity indicated a reduction in pitch efficiency towards the end of a pitcher's outing. Future research is needed to determine if this decrease in pitch efficiency increases a pitcher's risk of injury.

D03: PHOTOPLETHYSMOGRAPHIC HEART RATE ACCURACY DURING EXERCISE IN TEMPERATE AND HOT ENVIRONMENTS

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Increased skin blood flow (SkBF) and local sweat rate (LSR) during exercise heat stress may decrease the accuracy of heart rate (HR)

from wearable devices using photoplethysmography by interfering with light reflection at the epidermis. The purpose of this study was to test the hypothesis that heat stress reduces the accuracy of photoplethysmographic HR measurement during exercise. METHODS: Twenty-seven participants (52% female; mean±SD, age = 25±5 y, body mass = 76.2±14.0 kg) cycled in 22 °C (TEMP) and 35 °C (HOT) at progressively increasing intensities (50%, 60%, 70%, 80% of age-predicted maximal HR) over 40 min while wearing 3 photoplethysmographic devices (Apple Watch Series 8, Garmin vivosport 5, SlateSafety BAND V2) and a criterion device (Polar H10). HR, SkBF, and LSR were recorded during rest, exercise, and recovery. Device performance was evaluated using equivalence testing (equivalence zone, ±5 bpm) and differences in mean absolute error of HR measurement (MAE_{HR}) in TEMP vs. HOT were analyzed using a two-way (condition × intensity) analysis of variance. RESULTS: Based on 90% and 95% confidence intervals (CI), device HR was both equivalent and not different from criterion HR for Apple in both conditions at all intensities. Garmin HR was equivalent but statistically different from criterion HR only during recovery in HOT (95% CI [0.5, 2.9]). SlateSafety HR was not equivalent during HOT at rest (90% CI [-2.6, 5.3]) and very light intensity (90% CI [-6.5, 2.8]), and during TEMP at vigorous intensity (90% CI [-6.4, 2.8]) but was not different from criterion HR. MAE_{HR} was not different between conditions for Garmin (TEMP, 1.7±2.3 bpm; HOT, 1.4±0.9 bpm; P=0.13; η^2_G=0.01) or SlateSafety (TEMP, 3.8±7.2 bpm; HOT, 3.2±12.5 bpm; P=0.88; η^2_G<0.01) but was lower during HOT for Apple (TEMP, 0.9±1.5 bpm; HOT, 0.7±0.4 bpm; P=0.02; η^2_G=0.04), despite greater SkBF (P<0.001) and LSR (P<0.001) during HOT. CONCLUSION: Heat exposure did not increase error in photoplethysmographic HR measurement, although SkBF and LSR were elevated.

D04: A QUALITATIVE EXAMINATION OF FOOD CHOICE AMONG DIVISION III STUDENT ATHLETES USING GROUNDED THEORY

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BACKGROUND: Many National Collegiate Athletic Association (NCAA) student athletes do not meet recommended sports nutrition guidelines, and there are a wide range of factors influencing players' ability to meet their nutritional goals. The determinants of food choice among the general population have been extensively investigated, but studies of food choice in collegiate student athletes are limited. Understanding the influences of food choices in this population can enable and support optimal eating behavior, while also helping to ensure that eating behavior translates into practice. This study aimed to improve the theoretical understanding of athletes' determinants of food choice to help enable more effective eating behavior while protecting their overall health. METHODS: Division III college athletes (48% (n=10) male and 52% (n=11) female) from a variety of sports were recruited to participate in semi structured interviews concerning food choices and eating behavior cognitions. This study employed a theory-guided, grounded-theory approach, and open-ended interviews were analyzed using the constant comparative method. The athletes' words were used to label and describe their interactions and experiences with the food choice process. RESULTS: A theoretical framework of factors determining food choice in DIII student athletes was developed and consists of four dominant themes including individual factors (intrapersonal), athletic factors, social factors (interpersonal), and contextual factors (environmental). Additionally, a theoretical framework of barriers and enablers of student athlete food choice was also seen including the internal factors: Sport Nutrition Knowledge, Emotional/Psychological, Health Beliefs, and external factors: DIII Collegiate Environment, Facilities and Options for Healthy Food, and Sports Scheduling. CONCLUSIONS: When student athletes enter the collegiate sports environment, they must be aware of the challenges to make healthy food choices. From the theoretical frameworks of this study, practitioners and sports nutrition researchers have a better understanding of how DIII college student athletes make food choices. These results can serve as a tangible baseline for conversations with the NCAA for the provision of student athlete nutrition services.

D05: PERSONALITY TRAITS AS CROSS SECTIONAL AND LONGITUDINAL PREDICTORS OF HEALTH IN THE MIDUS STUDY

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BACKGROUND: Personality traits are associated with mortality and other health outcomes. Self-rated health (SRH) assessments ask single-item questions prompting individuals to rate their health on a Likert scale from poor to excellent. Questions regarding SRH are uniquely useful when examining issues that are difficult to capture with more nuanced health assessments. This study examined the ability of personality traits to predict SRH and other related SRH variables cross-sectionally and longitudinally. **METHODS:** Data from the Midlife in the United States (MIDUS) study was used (MIDUS 1 [1995-1996], MIDUS 2 [2004-2006], and MIDUS 3 [2013-2014]). All participants from the MIDUS study with complete data (n=2,552) were included. Personality traits and SRH was assessed during each time point (t=1, 2, & 3). Personality was examined using the Five-Factor Model (FFM): Openness (OPE), Conscientious (CON), Extraversion (EXT), Agreeableness (AGR), and Neuroticism (NEU). SRH variables included current health, control over health, thoughts/effort put into health, and life satisfaction. Multivariate regression analyses were used to examine the influence of personality on SRH variables at each timepoint. Statistical significance was set at $p < 0.05$.**RESULTS**: EXT and CON were consistently positively associated with all SRH variables at all timepoints (β=0.33-.70). NEU was mostly negatively associated with all SRH variables cross-sectionally (β=-0.14-0.54), but less consistently longitudinally. AGR was both negatively and positively related to some variables, cross-sectionally and longitudinally (β=-0.34-0.35). OPE was rarely associated with SRH variables. All models accounted for a small to moderate portion of the variance SRH (R2= -0.35-0.30).**CONCLUSION:** Personality traits influence SRH cross-sectionally and longitudinally. Notably, EXT and CON are positively related, and NEU is negatively related to self-reported health. Because of the propensity of people with certain personality traits to engage (or not) with certain health behaviors, interventionists may need to account for and make personalized therapeutic strategies based on an individual's personality trait profile to improve current and long-term health outcomes.

D06: RESPONSIVENESS OF HIP AND WRIST ACCELEROMETER-BASED PHYSICAL ACTIVITY ESTIMATES IN YOUTH

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BACKGROUND: Measurement of change in physical activity (PA) between time points is important for informing PA interventions and outcomes. The ability to detect change over time, or responsiveness, has received minimal attention in wearable activity monitors, especially compared with a criterion measure. The purpose of this analysis is to determine the responsiveness of accelerometer-based methods located at the hip and wrist to predict PA intensity in youth, compared to a criterion measure. **METHODS**: Forty-eight participants (11.8±3.3 yrs, 23 males) performed two 2-hr free-living visits. Participants wore a portable indirect calorimeter (Cosmed K4b^2 or K5) and ActiGraph GT9X devices (right and left wrists, right hip). For each visit, time spent in sedentary behavior (SB, <1.5 METs), light PA (LPA, 1.5-2.99 METs), and moderate to vigorous PA (MVPA, ≥3.0 METs) was calculated using indirect calorimetry and estimated using three hip-based regression methods and seven wrist-based cut-point methods. Change in time spent in each intensity level between visits was used as the measure of responsiveness. One-way repeated-measures ANOVAs and mean absolute error were used to compare responsiveness reported by each method to indirect calorimetry. **RESULTS**: There were no statistically significant differences between indirect calorimetry and the hip and wrist methods for mean responsiveness in SB (F=0.17, p=0.99), LPA (F=1.00, p=0.43), and MVPA (F=1.16, p=0.31). Mean absolute error between estimation methods and the criterion ranged from 21.5 to 42.2 minutes across intensity levels. **CONCLUSIONS**: The responsiveness of the accelerometer-based PA estimation algorithms in this analysis was similar to the change demonstrated by indirect calorimetry at a group level but demonstrated meaningful individual variability, indicating a potential washout effect. At a group level, the estimates appropriately responded to changes in youth PA levels, but further investigation is needed to assess individual-level applicability. **Funding information:** This research was supported by the NIH grant R01HD083431.

D07: RELATIONSHIPS OF FORCE AND DISPLACEMENT-DERIVED BRAIN ACTIVITY TO KNEE LAXITY DURING JOINT LOADING

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BACKGROUND: Joint laxity is a strong independent risk factor for ACL injuries. Measuring neural responses to knee joint loading in females with varying degrees of laxity is a novel approach to understanding possible neural biomarkers of ACL injury risk. By measuring brain activity via EEG during joint loading designed to stress the ACL, we aim to determine whether the EEG derived from a load or joint displacement interval results in a stronger relationship during anterior tibial translation (ATT). METHODS: EEG was recorded during 4 blocks of ATT (24 trials) in 27 physically active females (ages 18-30) with varying knee laxity (m ± sd = 6.1mm ±1.95). Clinical measures of anterior knee laxity (AKL) were obtained via KT2000 arthrometer. A novel knee arthrometer measured tibial displacement while an anteriorly directed force was applied to the posterior aspect of the tibia. Computed power spectral density (PSD) from EEG was obtained during joint loading and subsequently processed for both force (0 - 65N) and displacement (0 - 2.95mm) intervals (alpha, beta, and theta). PSD was examined in different brain regions (somatosensory cortex (SC), frontal cortex (FC), and whole brain (WB)) and partially correlated to laxity measures controlling for time to displacement(s), and magnitude of displacement(mm)/force(N) relevant to interval. RESULTS: For force-derived PSD, when controlling for time to displacement and displacement magnitude, significant correlations existed between AKL and PSD across FC (alpha: 0.019μV^2/Hz ± 0.401; r = 0.44, p = 0.01; theta: -0.305μV^2/Hz; ± 1.048r = 0.36, p = 0.04) and WB (beta: = -0.060μV^2/Hz ± 0.179; r = 0.33; p = 0.05;). Correlations in SC (beta: r = 0.30; p = 0.07), FC (beta: r = 0.30, p = 0.08), and WB (alpha: r = 0.29, p = 0.08) neared significance. For displacement-derived PSD, when controlling for time to displacement and force, there were no significant correlations. CONCLUSIONS: Force interval-derived EEG measures significantly correlated with knee laxity. The positive correlations we report suggest that changes in brain oscillatory activity are more closely associated with force applied to the knee rather than displacement of the tibia during joint loading. These findings are an initial step in understanding neural mechanisms that may be associated with an established ACL injury risk factor.

D08: EYES ON THE PRIZE: LINKING OCULOMOTOR BEHAVIOR TO MATCH PERFORMANCE IN COLLEGIATE WOMEN'S SOCCER

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BACKGROUND: The relationship between visual perception and action is crucial in dynamic environments like soccer, where effective oculomotor behavior (OMB) is essential for optimizing visual information processing. This optimization enables footballers to perceive complex environmental features and make beneficial decisions, which can influence match outcomes. Further, objective measures of OMB performance have emerged as reliable, quick, real-time tools to help detect mTBI in sport, as up to 90% of athletes suffering from mTBI show OMB performance decrement. This project aimed to identify specific OMB behaviors indicative of high performance in women's collegiate soccer. METHODS: A sample of 36 female soccer athletes completed the RightEye Sports Vision EyeQ assessment, which included 11 tests measuring OMB performance, yielding 21 variables. Next, 66 performance-related variables were extracted from match data to conduct Pearson correlation analyses to determine the relationships between OMB and match performance. Our dataset included only athletes averaging over 30 minutes of active participation in matches, reducing the sample to 20 athletes. RESULTS: We identified 39 significant correlations between OMB and match performance. Four notable correlations were found: i) positive correlation between horizontal saccade speed and average pass length (p = 0.048, r = 0.446), ii) positive correlation between vertical saccade accuracy and successfully completed through balls (p = 0.217, r = 0.510), iii) positive correlation between vertical saccade speed and shots blocked (p = 0.014, r = 0.540), iv) negative correlation between choice reaction time and shot assists (p = 0.0490, r = -0.446). CONCLUSIONS: These findings underscore the significant relationships between OMBs and on-field soccer performance. This data can inform player development and talent identification and enhance the ability to use oculomotor measures to detect mTBI and concussion.

M01: MEASURED VERSUS ESTIMATED RESTING ENERGY EXPENDITURE IN PERIMENOPAUSAL WOMEN

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BACKGROUND: Perimenopause is characterized by fluctuations in female-sex hormones and often accompanied by changes in metabolism and body composition, including loss of lean soft tissue (LST). The purpose was to evaluate differences in resting metabolic rate (RMR) when measured via indirect calorimetry (IC) vs predictive equations in perimenopausal women. A secondary aim was to explore relationships between age, hormones, LST, and differences in IC and predictive equation RMR values. METHODS: Ten perimenopausal women (Age: 49.2±5.1 yrs; Weight: 84.2±8.0 kg) were assessed for RMR (kcals/day) via indirect calorimetry. Estimated RMR was calculated from Cunningham (C), Harris-Benedict (HB), Molnar (M), De-Lorenzo (DL), and Mifflin-St. Jeor (MS) equations. Hormones including estrogen, progesterone, luteinizing hormone, and follicle stimulating hormone were measured using urinary test strips prior to RMR. LST was measured from whole body x-ray dual absorptiometry. Differences in measured and estimated RMR were evaluated with a mixed-model ANOVA using estrogen as a covariate. Pearson's correlation coefficient was calculated to assess the relationship between hormones, age, LST, and differences in RMR. RESULTS: Each predictive equation overestimated RMR, with significant differences seen between DL (mean difference ± standard error [IC-DL]:-632.2±62.9 kcals, p<0.001), C ([IC-C]: -401.0±53.6, p=0.001), HB ([IC-HB]: -344.5±60.5, p<0.007), and MS ([IC-MS]: -271.2±63.4, p=0.040). The Molnar equation most closely predicted RMR (-240.6±71.6, p=0.148). There were no significant relationships between any hormones, LST, age, and RMR estimations (p=0.673-0.950). CONCLUSIONS: IC RMR is significantly lower (-377.9±187.8 kcals) compared to all predictive equations, which may impact caloric goals and weight gain typically seen in this population. Fluctuations in hormones do not appear to be the driving factor in the overestimation of energy expenditure in predictive equations.

Grant or Funding information: These data were collected as part of a study funded by the American Diabetes Association.

M02: SHAPE THE PACE: TRAINING LOAD INFLUENCE ON MATCH TEMPO IN DI WOMEN'S SOCCER

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BACKGROUND: Match tempo (MT) is a tactical determinant of performance as it dictates the speed and flow of ball movement and decision-making on the field. A higher MT often reflects an ability to maintain possession under pressure, increasing opportunities to attack. This analysis aimed to evaluate the effects of training load on MT in Division 1 women's soccer. **METHODS:** Thirty-three NCAA DI women's soccer players (mean±SD; age=20.2±1.5 yrs) were tracked across a competitive season for training load (total distance [TD; m], accelerations [#], decelerations [#], high intensity running [HIR; m >15kph], and sprint distance [m >21kph]) using wearable GPS tracking devices, two (MD-2) and one day (MD-1) prior to match day. MT was measured as mean passes per minute of attacking ball possession in players that averaged at least 20 minutes of play. Bivariate correlations were used to characterize relationships, with stepwise linear regressions applied to significant outcomes. **RESULTS**: MD-2 TD (r=0.549, p=0.02), accelerations (r=0.528, p=0.015), and HIR (r=0.594, p=0.007) were positively correlated with MT, accounting for 41% of the variance. In contrast, MD-1 decelerations showed a negative correlation with MT (r=-0.452, p=0.03) and explained 21% of MT variance. No other training components were identified as significant predictors of MT (p > 0.05). **CONCLUSION:** MD-2 training load is a significant predictor of tactical performance. HIR and accelerations (which simulate a high press) are crucial for maintaining possession under pressure and increasing attacking opportunities during MD. In contrast, excessive MD-1 decelerations may hinder the speed of ball movement and decision-making, potentially due to muscle soreness from the high eccentric loads experienced during deceleration events. Simulating a high press on MD-2 while decreasing eccentric load in MD-1 is a scientific based approach that aims to improve MT in Division 1 women's soccer.

M03: Y BALANCE TEST BIOMECHANICAL CHANGES OVER TIME IN PATIENTS WITH ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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BACKGROUND: The Y Balance test (YBT) is commonly used after anterior cruciate ligament reconstruction (ACLR). It is often assumed that patients improve throughout rehabilitation, however, this has not been fully investigated. Our purpose was to 1) compare YBT trunk, hip and knee kinematics and kinetics and quadriceps strength throughout rehabilitation and 2) examine relationships between YBT biomechanics and quadriceps strength with patient-reported function. METHODS: 37 ACLR patients with primary unilateral ACLR (21 female, age 19.3 ± 3.1) participated. Outcomes were assessed at 4,5, and 6 months post-ACLR. Peak angles and internal moments of the trunk, hips and knees were measured during three anterior reach YBT trials via an integrated electromagnetic tracking and force plate system. Peak quadriceps isometric strength was measured using a dynamometer. Repeated measures ANOVAs were used to assess changes in variables over time for each limb. Tukey post hoc was used when appropriate. Pearson correlation coefficients were used to assess relationships between biomechanics, strength, and patient-reported function. RESULTS: Time x limb interactions were observed for trunk lateral flexion over the stance limb ($p < 0.03$, M6 ACLR limb > M4 reconstructed & M4, M6, M5 non-ACLR) and trunk rotation away from the stance limb ($p < 0.01$, M5 non-ACLR is different than M4 non-ACLR, M5 ACLR, M6 ACLR). Time main effects were observed for knee flexion ($p=0.04$, M6 > M4, M5) and quadriceps strength ($p = 0.01$, M4 < M5, M6). Limb main effects (reconstructed < healthy) were observed for knee flexion ($p = 0.01$), knee extension moment ($p =0.02$), hip flexion ($p =0.01$), and quadriceps strength ($p = 0.01$). Month 4 Tegner scores were positively associated with quadriceps strength ($r^2 = 0.14$). Month 6 ACL-RSI was positively associated with hip extension moment ($r^2 = 0.22$). CONCLUSIONS: ACLR patients' YBT trunk movements are highly variable. Patients' improvement in knee flexion and quadriceps strength do not follow a stepwise pattern over time. Our findings help to better understand the alterations that occur at the trunk, hip, and knee after ACLR.

M04: RELIABILITY AND VALIDITY OF A PORTABLE METABOLIC RATE ANALYZER IN RESISTANCE TRAINED WOMEN

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BACKGROUND:Considering resting metabolic rate(RMR) is an integral factor for the regulation of body weight, assessing new RMR assessment technology is critical. Consequently, the purpose of this study is to assess the day-to-day test-retest reliability and validity of the KORR-MetaCheck(KMC) indirect calorimetry analyzer compared to the Parvo Medics TrueOne(PMT) calorimeter in resistance trained women. METHODS:24 participants(21.8±3.7yrs; 67.9±14.4kg; 163.5±8.0cm) completed RMR assessments utilizing the KMC and the PMT analyzers in a randomized order, on two separate days(4 total; 2/day). To assess the internal consistency of the analyzers, Cronbach's Alpha(α) was assessed, while two-way mixed intraclass correlation coefficients(ICC) were used to assess test-retest reliability. Concurrent validity was further determined via Pearson product-correlation(r) analysis, Bland-Altman plots, students paired t-tests with a Bonferroni adjustment ($p<0.0125$), and linear regression analysis. Statistical significance was set at an alpha level of 0.05. RESULTS:The PMT analyzer demonstrated excellent internal consistency(α=.937) and good test-retest reliability(ICC=.987). The KMC analyzer demonstrated good internal consistency(α=.800) and good test-retest reliability(ICC=.800). Pearson's correlations indicated moderate to strong relationships between the devices on both testing days(Day 1: r=.506, p=.012; Day 2: r=.759, p<.001). Bland-Altman analysis indicated moderate agreement for both days, while significant differences were observed in t-tests between the devices for both Day 1(t (23) =-3.754, p=.001) and Day 2(t (23) =-6.707, p<.001). Linear regression analyses showed significant relationships with R2 values of .256(Day 1) and .576(Day 2), respectively. CONCLUSION:The KMC analyzer demonstrated good reliability, but moderate agreement with the PMT analyzer. Familiarization with the KMC analyzer may improve data quality and should be considered in clinical or practical settings.

M05: IMPACT OF AN 8-WEEK RESISTANCE TRAINING PROGRAM ON LOWER BODY MUSCULAR POWER IN INDIVIDUALS TREATED FOR CANCER

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BACKGROUND: Cancer treatments often result in significant declines in physical function and muscle strength in individuals treated for cancer. Lower body power can also be affected, which is important given its role in maintaining functional independence and preventing falls. Improvements in physical function and muscular strength have been observed with individuals treated for cancer engaging in exercise. However, much less is known about the impact of engaging in resistance training on muscular power in oncology. The purpose of this study was to examine the effects of an 8-week resistance training program on lower-body muscular power in individuals with cancer. **METHODS**: A total of 55 individuals previously treated for cancer participated in an 8-week, 2x-week structured exercise intervention designed to enhance lower body strength and power. Sit to Stand (STS) power tests were administered both before and after the intervention. Differences in muscular power were analyzed using a paired t-test, and effect size was determined using Cohen's d. All analyses were performed using R software **RESULTS**: The majority of participants (81.9%) were female, with 75% having undergone treatment for breast cancer. The participants' mean age was 62±9 years, height 168±8.1 cm, and weight 84.8±22.2 kg. There was a significant increase in mean STS power from 1072.71 ± 512.99 watts pre-intervention to 1484.13 ± 935.66 watts post-intervention ($t = -3.59$, $df = 54$, $p = 0.00071$). The mean increase in power was 411.42 watts (95% CI: 181.66 to 641.17). Cohen's d indicated a medium effect size (0.515). **CONCLUSION**: Participating in 8 weeks of resistance exercise results in significant improvements in lower-body muscular power in individuals previously treated for cancer. The medium effect size underscores the clinical relevance of these changes, though a limitation of this research is the absence of a control group for comparison. Further research is needed to evaluate the long-term impact of exercise interventions on power output and functional outcomes in individuals treated for cancer.

M06: COMPATIBILITY OF INERTIAL MEASUREMENT UNITS AND OPTICAL MOTION CAPTURE TO ANALYZE DEADLIFT PERFORMANCE IN SOLDIERS

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BACKGROUND: A hex bar deadlift (HDL) is a critical component of the Army Combat Fitness Test. Due to the risk of injury to the pelvis and spine there is a need for remote kinematic data collection in tactical environments. The purpose of this study is to compare the compatibility of inertial measurement units (IMU) and optical motion capture (OMC) tracking of trunk, pelvis, and thigh orientation during the HDL. **METHODS**: Ten soldiers (8M, 2F) performed HDL at 85 and 93% one-repetition maximum. IMU and OMC marker clusters were secured to the thighs, pelvis, and upper-spine to record trunk/pelvis segment angles and trunk-pelvis and pelvis-thigh relative angles. Based on total trunk displacement, the concentric phase of three repetitions was divided into three phases. Root mean square differences (RMSD) between IMU and OMC tracking were computed. T-tests were conducted for each RMSD to determine if IMU-OMC deviations significantly differed from zero followed by separate load by segment analyses of variance conducted on each angle. **RESULTS:** All RMSD values were significantly different from zero ($P<.007$, $d=1.0$ to 2.1). No significant differences were revealed for either the trunk ($P>.369$) or pelvis ($P>.259$) segment angles with overall RMSD of 2.3±1.5° and 2.7±1.3° for the trunk and pelvis segment angles, respectively. For the trunk-pelvis relative angle, there were no significant differences ($P>.112$) with an overall RMSD of 3.4±2.7°. Load had no significant effect on the pelvis-thigh relative angle ($P>.552$). The RMSD was found to be significantly greater for the first phase (8.1±5.0°), compared to the second (5.9±3.7°, $P=.040$, $d=.47$) and third (5.4±4.2°, $P=.026$, $d=.52$) phases. **CONCLUSIONS:** While IMU-OMC differed significantly, the discrepancy magnitudes between the two systems remained constant, therefore demonstrating that portable IMU systems may serve as a preferred data collection method in remote settings. **DISCLAIMER:** The study was funded by Military Operational Medicine Research Program MO230055. The authors declare no conflicts of interest and no financial

relationships/affiliations with any products and/or equipment used in the study. The views expressed in this manuscript are those of the authors and do not reflect the official policy of the Department of Army, Department of Defense, or the U.S. Government.

M07: DOES A SWIMMING PROGRAM INCREASE SELF-EFFICACY IN INDIVIDUALS WITH INTELLECUTAL DISABILITY? A QUALITATIVE STUDY

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BACKGROUND: Short-term adapted swimming programs for individuals with intellectual disability (ID) are geared towards improving skills and confidence in the water and may increase self-efficacy and self-esteem. Insight into this may be gained by examining the perspectives of stakeholders of such programs. **PURPOSE:** We investigated if a 5-day adapted swimming program improves self-efficacy and self-esteem in individuals with ID from the perspectives of the swimmers themselves, their parents, and the volunteering staff. **METHODS:** The program was conducted over 5 days (60 min·day^{-1}) and targeted swim skill development and independence by adapting instruction to the abilities of swimmers. Each participant was supported by a volunteer without disability. After the program, we conducted semi-structured interviews, each lasting 30-45 minutes, with 5 swimmers (age 14-35 years; 4 females), 5 parents (age 40-70 years; 5 mothers), and 5 volunteers (age 17-64 years; 4 females). Interviews began with general questions about the program and progressed to specific about the swimmers' self-efficacy, self-esteem, and other program outcomes. Interviews were audio-recorded and transcribed verbatim. Themes were extracted via open, axial, and focused coding. Rigor was ensured by preserving trustworthiness and authenticity. **RESULTS:** Parents and volunteering staff concurred that self-esteem and self-efficacy increased in swimmers. Some responses by swimmers indicated improvements in self-efficacy and self-esteem, whereas other indicated no change. Emerging themes were consistent with Bandura's Self-Efficacy Theory (SET): (a) *previous experience* in the water; (b) *vicarious experience* from observing others; (c) *social persuasion* from peers; and (d) *feedback* from instructors and volunteers. Additional themes were consistent with Self-determination Theory (SDT): (a) *autonomy* in aquatic activities; (b) *competence* by acquiring skills; and (c) *relatedness* with others in the program. All participants stressed the role of a supportive environment for increasing self-efficacy and self-esteem. **CONCLUSION:** A 5-day swimming program improves self-efficacy and self-esteem in individuals with ID from the perspectives of the swimmers, their parents, and volunteering staff. Themes were consistent with SET and SDT.

M08: NEUROMUSCULAR ADAPTATIONS FOLLOWING ELASTIC BAND TRAINING WITH AND WITHOUT MAXIMAL MENTAL EFFORT IN OLDER WOMEN

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BACKGROUND: Impairments in neural activation of skeletal muscle significantly contribute to age-related muscle weakness. Though using a maximal mental effort (ME) has been suggested to stimulate neural adaptations at minimal training intensity, its effectiveness during practical, moderate intensity strength training is unknown. This study aims to determine if maximal ME during elastic band training enhances neuromuscular adaptions in older women. METHODS: As part of an ongoing study, healthy older women (70.5±4.2 yrs) were randomly assigned to an elastic band training (EBT; n=9), EBT with maximal ME (EBT+ME; n=12), or control group (CON; n=10). EBT and EBT+ME participated in moderate intensity, whole-body elastic band training 3/week for 6 weeks, but EBT+ME mentally urged their muscle to contract maximally during exercise performance. Total body and segmental dry lean mass (DLM) were measured, and cross-sectional area (CSA) and quality of the biceps brachii, vastus lateralis, and rectus femoris were assessed via ultrasonography. Dynamic strength and neuromuscular outcomes were assessed with a bicep curl 1-repetition maximum (1-RM) test and maximal isometric elbow flexion with percutaneous muscle stimulation, respectively. Peak torque, contractile properties, and voluntary activation (VA) were calculated. Data were analyzed using two-way repeated measures ANOVAs. RESULTS: EBT and EBT+ME showed similar improvements in 1-RM ($p<0.001$; g=0.81-1.79), muscle CSA ($p<0.001$; g=1.08-1.91) and quality (p=0.001-0.026; g=0.73-1.10). DLM and contractile properties remained unchanged (p=0.141-0.991; η^2_p=0.00-0.17). VA increased similarly across groups (p=0.027; η^2_p=0.21). CONCLUSIONS: These results support the effectiveness of moderate intensity elastic band training for improving strength and muscle health in older women. It is likely that the training sufficiently improved neural activation regardless of ME use, but further analysis is warranted as our sample size increases.

U01: PHYSICAL FUNCTION FALL RISK APPRAISALS AMONG COMMUNITY-DWELLING OLDER ADULTS: AN ROC ANALYSIS

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Physical function assessments are commonly used to assess fall risk among older adults, yet they may overclassify individuals as a high fall risk. Center-of-pressure postural sway path length (i.e., postural sway) is validated as a criterion fall risk appraisal tool, but it is unclear how the Timed-Up-and-Go (TUG) and the Short Physical Performance Battery (SPPB) compare. Therefore, the purpose of this study was to examine the sensitivity, specificity, and accuracy of classifying high and low fall risk among older adults using the static stance center-of-pressure-postural sway via the BTrackS Balance System, the SPPB, and the TUG. We conducted a cross-sectional study with 234 community-dwelling older adults (women=203, age=75.0±7.0 years, height=159±7.9 cm, BMI=30.0±6.3 kg/m²) comparing fall risk appraisal with three physical function assessments. Cut off scores for SPPB (<7 out of 12), TUG (<20 seconds), and BTrackS (<30 cm) assessments were used to categorize participants as a high or low fall risk. McNemar tests were used to compare fall risk appraisal between assessments. Participants had a mean TUG time of 10.2±6.3 seconds, SPPB Score of 8.7±2.3, and postural sway of 34.7±21.3 cm. Both the TUG (high risk=10, low risk=224; X^2=95.9, $p<0.001$) and the SPPB (high risk=40, low risk=194; X^2=55.7, $p<0.001$) significantly differed in their fall risk appraisal compared to the BTrackS (high risk=115, low risk=119). Compared to the BTrackS, the TUG had a sensitivity of 4.3%, specificity of 95.8% and accuracy of 50.9%. Similarly, the SPPB had a sensitivity of 23.5%, specificity of 89.1%, and accuracy of 56.8% compared to the BTrackS. The TUG and the SPPB both demonstrated low sensitivity and accuracy, suggesting that they may be better suited as measures of physical function rather than fall risk. Clinicians may benefit from using center-of-pressure postural sway or other criterion measures to screen for fall risk.

U02: EXAMINING THE RELATIONSHIP BETWEEN LEFT VENTRICULAR FUNCTION AND EXERCISE CAPACITY IN LYMPHOMA PATIENTS UNDERGOING CHEMOTHERAPY

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Although the efficacy of anti-cancer drugs like anthracycline based chemotherapies (Anth-bC) have increased dramatically, many patients experience exercise intolerance due to the cardio-toxic nature of these drugs. The determinants of exercise capacity can be modeled with the Fick Equation where VO_2 = cardiac output x arterio-venous oxygen content difference. To quantify the determinants of exercise capacity we compared resting and peak exercise cardiovascular hemodynamics among fourteen (5 men and 9 women) anthracycline treated survivors (ATS) that were at least 12 months post treatment to 14 health, age, and fitness matched controls. A cardiopulmonary exercise test and cardiac magnetic resonance imaging protocol was utilized to determine peak exercise capacity (VO_2 peak) as well as left ventricular function immediately post exercise (IPE). Exercise capacity among ATS was determined to be 22% reduced compared to CON (VO_2 peak; 26.9±6.4 ml/kg/min vs. 34.3±6.3 ml/kg/min; p=0.00). Immediate post cardiac output trended lower in ATS compared to CON (5.7±1.3 vs. 5.9±1.3 L/min/m^2; p=0.62) and was due to a significantly lower exercise SV in ATS compared to CON (44.5±8.5 vs. 52.8±10.3 ml/m 2 ; p=0.04). Immediate post exercise heart rate trended higher in ATS compared to CON (128±24 vs. 115±25 b/min; p=0.17). Linear regression analyses were used to explore the relationship between peak VO_2 to changes in left ventricular function measures. A strong significant correlation was found between peak exercise VO_2 and EDV (r = 0.56) in ATS while the same relationship was weak and non-significant in CON (r = 0.06). These results suggest that ~30% of the reduction in peak VO2 in ATS is attributable to impaired left ventricular filling during exercise. Medical and/or lifestyle therapies to improve left ventricular compliance and filling should be investigated in ATS.

U03: INVESTIGATING THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND PERCEIVED PSYCHOLOGICAL STRESS USING NOVEL PHYSICAL ACTIVITY METRICS

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BACKGROUND: High levels of perceived psychological stress (PPS) are a growing issue among college-based young adults (CBYA). Although studies have shown negative associations between device-measured physical activity (PA) and PPS, the literature remains inconsistent. This inconsistency may stem from heterogeneous PA measurement, including variations in device brands, intensity cut points, and wear locations. Using comparable PA metrics derived from raw acceleration may address these limitations. This ongoing study aimed to test whether Euclidean Norm Minus One (ENMO) and intensity gradient (IG) are associated with PPS. METHODS: The sample included 284 CBYA (mean age: 20.2 ± 1.6 years; 69% female; 61% White). Mean daily ENMO (higher ENMO = higher PA volume) and IG slope (more negative [lower] IG = more time spent at lower PA intensities) were measured using a thigh-mounted activPAL4 over seven days and analyzed with the R package GGIR. PPS was assessed using the 10-item Perceived Stress Scale. Multiple linear regression models tested the relationships between ENMO and IG with PPS, adjusting for *a priori*-determined covariates, including age, sex, race, body fat percentage, activPAL wear time, and sedentary behavior time. RESULTS: The mean ENMO was 419 ± 165mg, IG was -2.04 ± 0.24, and PPS score was 20.9 ± 3.3. A statistically significant negative association emerged between ENMO and PPS (β = -0.003, 95% CI: -0.005 to 0.000, p = 0.036), but no significant relationship was found for IG (β = -0.5948, 95% CI: -2.464 to 1.274, p = 0.531). There was a significant ENMO*IG interaction (β = -0.009, 95% CI: -0.004 to 0.000, p = 0.043); individuals with high ENMO and high IG (mean PPS score = 20.2, 95% CI: 19.5 to 20.9) reported significantly lower perceived stress scores (p < 0.05) compared to those with low ENMO and high IG (22.2, 95% CI: 21.2 to 23.3). CONCLUSION: A negative relationship for ENMO suggests that higher total PA volume is associated with lower PPS. This aligns with previous findings, but our PA metrics provide greater comparability for future research. The interaction findings indicate that higher intensity PA accumulated across lower volumes of PA is particularly detrimental to PPS, which has implications for later interventions. Future research should adopt these standardized, device-independent PA metrics.

U04: IMPACT OF SECONDARY POSITIONS ON INJURY RATES IN YOUTH AND HIGH SCHOOL PITCHERS

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BACKGROUND: Though it is known that baseball athletes who play the position of both pitcher and catcher are at a 2.9 times higher risk of injury, it is unknown if a pitcher playing multiple positions outside of catching also increases the relative risk of throwing-related injury. While restrictions on pitch counts and innings pitched have been established, evaluating pitchers based on the number/type of positions they play may be another criterion for preventing injuries. The purpose of this study was to analyze the frequency of injuries in pitchers who play multiple positions. METHODS: 190 youth and high school pitchers (1.63 ± 0.16m, 58.2 ± 16.0 kg, 13 ± 2 yrs) completed a health history questionnaire that included questions about positions played, injury history (yes/no), and current pain status (yes/no). Participants were excluded if any of the questions of interest were incomplete. After grouping participants by their secondary position(s), injury status (pain presence or surgery related to baseball) was compared with a chi-squared test (α = .05). RESULTS: Statistical analysis showed no significant association between secondary positions and injury ($\chi2(12) = 9.85$, p =.629). Players who only pitched had a 21.4% chance of injury, while pitchers who also played catcher had a 37.5% chance of injury. All remaining groups had injury prevalences between 0% and 20%, except one group, with a sample size of 2 comprised of participants who played pitcher, catcher, and middle infield and had an injury prevalence of 50%. CONCLUSION: Although no differences were found between secondary positions played and injury rates in youth and high school pitchers, playing multiple positions appeared to decrease injury frequency. The only exception is pitchers also playing the position of catcher. One might conclude that in an attempt to mitigate injury, youth and high school pitchers should play more than one position, though preferably not the catcher position.

U05: PRELIMINARY EXPLORATION OF PHYSICAL ACTIVITY MODERATION ON STRESS AND IMMUNE HEALTH IN COLLEGE-BASED YOUNG ADULTS

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BACKGROUND: Some college-based young adults (CBYA) have reported elevated levels of psychological stress due to pressures related to academic performance. Chronic stress may contribute to negative health outcomes, including diminished immune function. Physical activity (PA) has been shown to improve immune function and reduce stress; however, high rates of physical inactivity have been reported within CBYA. Currently, it is unclear if PA moderates the relationship between perceived stress and immune function in CBYA.
PURPOSE: To explore the moderative role of PA on measurements of perceived stress and immune function in CBYA.
METHODS: 38 healthy individuals (71.1% female, 44.7% white, age: 20.2±1.5y, BMI: 22.9±3.6kg·m-2) arrived at the laboratory in a fasted state where they completed measurements of psychological stress (Perceived Stress Scale - 10 Items; PSS-10) and a resting blood sample was collected for white blood cell (WBC) quantification. PA was tracked via a thigh-based accelerometer (activPAL4) for 7 days post-visit. Mean daily Euclidean Norm Minus One (ENMO) measurements were calculated to quantify total PA volume via the GGIR R package. Moderation analyses were performed via the medmod module in jamovi with significance set to p<0.05.
RESULTS: The moderating effect between stress and PA on immune function was not statistically significant (β: 3.46x10-4, 95%CI: -3.73x10-4-0.0012, p=0.345). The direct effects of stress (β:0.052, 95%CI: -0.0920-0.1953, p=0.481) and PA (β: -1.55x10-4, 95%CI: -0.0028-0.0025, p=0.905) on immune function were also not statistically significant.
CONCLUSION: Total volume of daily PA did not moderate the association between perceived stress and immune function. Likewise, a direct effect was also not observed between stress or PA alone on immune health, which may indicate a lack of statistical power due to a small sample size. Ongoing analyses will continue to investigate this relationship with a larger sample size and will include additional assessments on the moderative role of other PA factors (e.g., intensity, frequency, duration, etc.) to further our understanding of the benefits of PA within CBYA.
Funding: Research supported by the National Heart, Lung, And Blood Institute of the National Institutes of Health, Award Number R01HL162805 and R01HL157187.

U06: THE ASSOCIATION BETWEEN SLEEP REGULARITY AND HEART RATE VARIABILITY

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BACKGROUND: Heart Rate Variability (HRV) is a measure of the beat-to-beat changes in the time intervals between successive heartbeats and reflects autonomic nervous system activity. A lower resting HRV is associated with an increased risk for cardiovascular disease (CVD). Sleep regularity, defined as the consistency of daily sleep duration, is an emerging CVD risk factor. Meeting the recommended hours of sleep per day is associated with higher resting HRV; however, the relationship between sleep regularity and HRV remains unclear. This study investigated the association between sleep regularity and HRV in college-based young adults (CBYA), a population who often report poor sleep patterns. **METHODS:** At a laboratory visit, CBYA (N=48, mean ± SD age 20.6 ± 1.7 years; 77.1% female; 70.8% White) completed 5 minutes of quiet rest in a semi-recumbent position, during which root mean square of successive differences (RMSSD) and high-frequency (HF; 0.15-0.40 Hz) HRV parameters were recorded via 3-lead electrocardiography (MindWare Mobile Device). Then, participants took home the validated SleepScore Max device, which objectively measured sleep regularity across 7 days, defined as the

mean standard deviation of daily sleep duration. The cross-sectional association between sleep regularity and HRV metrics was explored using separate linear regression analyses, adjusted for race, sex, total sleep time, and body mass index. **RESULTS:** Mean ± SD sleep regularity was 83.4 ± 44.6 min/day, RMSSD was 61.3 ± 34.9 ms, and HF-HRV was 1872 ± 1706 ms². No statistically significant associations emerged between sleep regularity and RMSSD HRV (β = -0.011, *p* = 0.946) or HF-HRV (β = -0.034, *p* = 0.832). **DISCUSSION:** These preliminary findings suggest that sleep regularity is not associated with HRV in CBYA. However, when data collection is complete (target N=500), additional analyses will allow for a more comprehensive examination of these findings. Future research could investigate the association between sleep regularity and HRV in populations at higher risk for CVD, as well as explore regularity in sleep and wake times.

U07: PRELIMINARY INVESTIGATION OF TRG-HDL RATIO MODERATION ON BURNOUT AND HEART RATE VARIABILITY IN COLLEGE STUDENTS

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BACKGROUND: Pressure to academically succeed may place college-based young adults (CBYA) at greater risk of burnout. The root mean square of successive differences (RMSSD), a measure of heart rate variability (HRV), is a marker of autonomic activity that has been strongly correlated with academic stress in university settings. The triglyceride-to-HDL cholesterol (TRG-HDL) ratio has been shown to be a predictive indicator of cardio-atherosclerotic risk within CBYA. However, it remains unclear whether the TRG-HDL ratio moderates the relationship between burnout and RMSSD in CBYA. **PURPOSE**: To investigate the moderative role of the TRG-HDL ratio on the association between academic burnout and autonomic activity in CBYA.**METHODS**: 164 healthy individuals (69.5% female, 62.8% white, age=20.1±1.6y, BMI=24±4.2kg·m^2) arrived fasted and completed the School Burnout Inventory (SBI). A resting blood sample was provided for HDL and triglyceride quantification. The TRG-HDL ratio was calculated to assess cardiometabolic risk. HRV was measured for 5 minutes via 3-lead electrocardiography after 10 minutes of rest. RMSSD was log-transformed for normalization. Moderation analyses were conducted using the medmod module in jamovi, with significance set at p<0.05.**RESULTS**: The moderating effect of TRG-HDL between SBI and RMSSD was not statistically significant (β:-0.008, 95%CI: -0.034-0.018, p=0.553). The direct effect of TRG-HDL was also not significant (β:-0.076, 95%CI: -0.168-0.016, p=0.104); however, the direct effect of SBI trended towards significance in a negative direction (β:-0.020, 95%CI: -0.040-1.95x10^{-4}, p=0.052).**CONCLUSION**: The TRG-HDL ratio did not moderate the relationship between academic burnout and RMSSD. Although no direct effect was observed for the TRG-HDL ratio, the direct effect of burnout on RMSSD approached significance, potentially supporting previous research findings. Further analyses with a larger sample size along with simple slope analyses will be used to further explore the moderative role of the TRG-HDL ratio, potentially illuminating its influence on autonomic dysfunction due to academic pressures.**Funding:** Research supported by the National Heart, Lung, And Blood Institute of the National Institutes of Health, Award Number R01HL162805 and R01HL157187.

U08: THE EFFECT OF MISALIGNMENT OF SLEEP-WAKE RHYTHM ON STRESS IN HIGH SCHOOL SENIORS

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Background: Studies have found that 60% of young adults suffer from poor sleep quality, which is associated with higher stress, mental illness, and alterations in the sleep-wake cycle. The transition from high school to college is linked to psychological stressors and changes in sleep behavior enhancing social jetlag to occur. The term social jetlag refers to the concept of one's midpoint in sleep changing on weekends relative to weekdays. Therefore, the purpose of this study was to determine the relationship between social jetlag and changes in perceived stress in high-school seniors. Methods: This cross-sectional study recruited 141 high school seniors, 69% female, 18±1 years with a body mass index of 24±5 kg/m2. Perceived stress was assessed using Perceived Stress Scale (PSS-10). Sleep was assessed using Actigraph GT9X Link accelerometers, worn for 7 consecutive days and a sleep log. Social jetlag was determined by finding the difference between the midpoint of sleep on weekdays compared to weekends and divided into three groups <1h, 1-2h, ≥2h. All measures were assessed in the participants' final year of high school using multiple regression statistical analysis with significance set at p<0.05. Results: PSS-10 was not significantly correlated with social jetlag (p=0.90); however, it was independently associated with the average sleep midpoint on weeknights (r=0.21, p=0.02) and on weekends (r=0.22, p=0.01). A significant difference (p=0.005) was observed between PSS-10 and the social jetlag groups (<1h; 19±6, 1-2h; 23±7, ≥2h; 18±5). In addition, a significant difference in sleep midpoint on weekdays (p=0.02) and weekends (p=<0.0001) was observed. Conclusion: Social jetlag did not impact perceived stress levels. However, participant stress levels were higher when they went to bed later both weekdays and weekend days. Grant Information: Funding for this project was provided by the National Institutes of Health under grant number R15HL159650 and Elon University.

Symposia

S01: ADVENTURE AWAITS: EXPLORING THE THRILLS ASSOCIATED WITH RISKY PLAY IN YOUNG CHILDREN

Rebecca A. Battista, FACSM[1], Dawn P. Coe, FACSM[2], Emmaline M. Denton[3]. *[1]Appalachian State University, Boone, NC. [2]University of Tennessee, Knoxville, NC. [3]Duke University, Durham, NC.*

Children spend a substantial amount of time in early childhood education centers. An integral part of these childcare centers is the physical environment, which has the potential to foster healthy behaviors such as physical activity and play. Play, which is usually unstructured and child directed, can provide physical, social and cognitive development. A subcomponent of play, known as risky play, is integral to child development providing opportunities for children to engage in activities that support motor skills, encourage physical activity that can be categorized as moderate-to-vigorous, and teach risk management. However, despite its benefits, risky play also introduces the potential for injury. The term "risky play" has been inconsistently defined, complicating its use and assessment. This symposium aims to clarify risky play through a concept analysis, offering a precise definition and providing guidelines for its assessment. The presenters will provide an in-depth description of risky play, provide examples of risky play and discuss its usefulness, explain a concept analysis, and suggest ways to apply this type of analysis to the topic of risky play, providing a clear framework for understanding and implementing this concept in educational settings. Objectives for this symposium include 1) gaining an understanding of risky play and its role in childhood development; 2) learning strategies for assessing risky play; 3) creating opportunities for risky play while mitigating injury risks; and 4) discussing the complexity involved in identifying the level of risk as it fluctuates based on a variety of factors (i.e. child, age, motor skill level, etc.).
Artificial intelligence (AI) tools were used in the collection and analysis of data, writing of the abstract/presentation, and production of images or graphical elements of this abstract/presentation.

S02: APPLICATION AND BREAKDOWN OF THE COUNTERMOVEMENT JUMP FOR SPORT AND CLINICAL SETTINGS

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The bilateral countermovement jump (CMJ) is widely recognized as a reliable predictor of overall athletic performance. It offers valuable insight into an athlete's ability to utilize the stretch shortening cycle, produce lower body power, neuromuscular function, and fatigue. As indicated by literature, the CMJ popularity has surged across sports disciplines due to the ability to obtain real-time results for a large volume of athletes, in a limited time frame. While this increase in popularity has allowed more access to objective data at different levels of sport and rehab, it has also revealed inconsistencies in variable identification and sport specific application. Therefore, the purpose of this symposium is to discuss the science behind the CMJ, potential inconsistencies of data collection, and the practical application of the CMJ for performance enhancement and injury prevention. The presentation will begin with a brief review of CMJ literature including a breakdown of the phases during the CMJ with ground reaction force data as well as the typical process for data collection. The next section will include case studies and a biomechanical analysis of the CMJ,

featuring key points to examine throughout the movement. The tutorial will conclude with a practical application of CMJ results for researchers and practitioners to see how the CMJ can be applied in athletic and clinical settings. Attendees will gain knowledge about current literature, key phases of the CMJ, various techniques, metrics and overall applications of the CMJ to further understand how to best implement and analyze this movement in their performance testing battery.

S03: LITTLE BODIES, BIG DATA: EXPLORING CHILDHOOD OBESITY AND BODY COMPOSITION

Katherine E. Spring[1], Danielle D. Wadsworth, FACSM[2]. *[1]Pennington Biomedical Research Center, Baton Rouge, LA. [2]Auburn University, Auburn, AL.*

Childhood obesity remains a significant public health concern in the United States, with data indicating that 1 in every 3 children aged 2-5 are obese. Much of the research on childhood obesity in preschool-aged children relies on body mass index (BMI) due to its simplicity, low cost, and widely accepted reference values for children and adolescents. However, BMI has shown weak associations with body fat in children across different weight categories. Given that body composition tends to track from childhood into adulthood, a deeper understanding of body composition in young children is essential. Such knowledge could provide insights into the development of fat mass and lean mass, as well as the relationship between physical activity, motor skills, overall health and body composition. The purpose of this tutorial is to present and discuss methodologies for assessing body composition in preschool-aged children. Specifically, this symposium will (a) offer a brief overview of current research on body composition in young children aged 3-5, (b) explore techniques and challenges in measuring body composition in this age group, (c) review emerging evidence regarding body composition in young children, and (d) discuss future directions for research and implementation. *Artificial intelligence (AI) tools were not used in the writing of this abstract.*

S04: NCAA DII COACHES' MENTAL HEALTH LITERACY TO SUPPORT STUDENT-ATHLETES' MENTAL WELLNESS

Scott D. Bassett. *Mercer University, Atlanta, GA.*

Discussions about the impact mental health has on student-athletes' continues to increase in collegiate athletics. As leaders, college coaches play an integral part in supporting student-athletes. In this leadership role, coaches should have the proper knowledge and skills to support their student-athletes' mental wellness and the ability to recognize associated signs and symptoms related to mental health challenges. The purpose of this research was to evaluate coaches' mental health literacy (CMHL) to support student-athletes' mental wellness. A total of 34 coaches from two National Collegiate Athletic Association DII conferences (PBC n=7, GSC n=27) participated in the research to evaluate their mental health literacy. Dr. Bassett will provide an explanation of the research results on CMHL and how coaches' metacognitive awareness may have impacted the results. Furthermore, Dr. Bassett will provide insight into the potential need for healthcare professionals to be more involved in student-athletes' mental wellness. The learning objectives are to a) understand the limited priority coaches take in supporting student-athletes' mental wellness and the need to improve CMHL, b) the important leadership role coaches play in supporting student-athletes' transitioning from high school to college, and c) opportunities for future research to further engage coaches in mental health training to improve their mental health literacy.

S05: CHARACTERIZING THE FEMALE HORMONE PROFILE: LIMITATIONS, BARRIERS, AND POTENTIAL SOLUTIONS FOR RESEARCH AND APPLICATION

Katie R. Hirsch. *University of South Carolina, Columbia, SC.*

In recent years, the demand for female specific health, nutrition, and exercise recommendations has skyrocketed. With it, has come a call to action for research that includes and is specific to women. While this call to action has been met with great enthusiasm, characterization of the female hormonal profile remains a significant source of questions and a barrier to conducting high-quality female research, adding real or perceived complication, time, and expense to research studies. To adequately study women and promote inclusion in research, accurate, reliable, and most importantly, feasible methods that quantify and capture the variability that defines the female hormonal profile is critical. A limitation of current methodology is the inability to account for and quantify the significant amount of hormonal variability that occurs both between and within women throughout menstrual cycles. A second limitation is the inability to effectively and feasibly characterize the hormonal profile of women with non-traditional profiles. This includes the 65% of women using hormonal contraception, upwards of 60% of female athletes who are amenorrheic, and the millions of women who are peri or postmenopausal. The goal of this talk is to address some of the limitations and barriers being faced across research, clinical, and athletic settings when it comes to accounting for the female hormonal profile and provide some potential alternatives and solutions. Specifically, this talk will: 1) Review current methodology for tracking hormonal status, characterizing menstrual phase, and evaluating overall female health; 2) Address limitations and barriers to implementation and application of hormone tracking across research, clinical, and athletic settings; and 3) Present original data on the utility and feasibility of daily urine hormone analysis as an alternative approach; highlighting insights into female physiology that this method has started to provide and discussing considerations for application and implementation.

S06: MUSCLE PROTEIN BALANCE: HYPERTROPHY, ATROPHY, AND NOVEL FINDINGS

J. Max Michel, Michael D. Roberts, Daniel L. Plotkin. *Auburn University, Auburn, AL.*

Skeletal muscle is a highly plastic tissue that responds to various external stimuli. The two hallmark adaptations are muscle hypertrophy in response to some type of mechanical loading (e.g. resistance exercise training), and muscle atrophy in response to the unloading or disuse of a muscle. These responses are tightly regulated by muscle cellular signaling events that occur acutely and chronically in response to such stimuli. While these signaling events often coincide with the measurable atrophy or hypertrophy of a given muscle, this is not always the case. In the absence of technically challenging tracer techniques to directly measure muscle protein synthesis and breakdown, it can be useful to measure these signaling pathways to assess the likely contributions to muscle protein balance. The purpose of this symposium is three-fold: 1) to provide an overview of the cellular signaling events that produce/coincide with resistance training-induced hypertrophy, and disuse- or aging-induced atrophy (Dr. Roberts); 2) to present molecular signaling data from rodents that underwent muscle atrophy due to aging or disuse, and humans that underwent disuse followed by resistance training (J Max Michel); and 3) to present a novel technique that might elucidate a potential mechanism and/or associated molecular signature of muscle protein turnover (Daniel Plotkin). This symposium will appeal to a broad audience from basic scientists to those with applied interests.

S07: OXYGEN UPTAKE RESPONSES TO STRENGTH TRAINING: WHY INCREASED HEART RATE AND VENTILATION AREN'T ENOUGH

Christopher Joseph Womack, FACSM. *James Madison University, Harrisonburg, VA.*

It has long been observed that while resistance training has a myriad of positive health outcomes; it either does not increase maximal aerobic capacity (VO_{2max}), or the improvements are so small as to be of dubious practical significance. This is likely because oxygen uptake (VO_2) does not substantially increase during an acute bout of strength training, even though heart rate (HR) is elevated. The latter physiological response has led some to incorrectly conclude that if a strength training prescription is modified to elevate HR, using higher repetitions and short rest periods, improved cardiorespiratory fitness will result. The logic for this approach ignores the fact that oxygen pulse is notably declined during resistance training because of a disproportionate increase in heart rate compared to VO_2. This presentation will demonstrate that resistance training, per se, is not an effective intervention to increase VO_{2max} and evidence for this thesis will include data on the HR and VO_2 responses to strength training, reported VO_{2max} increases for resistance training programming, and differences in ventricular remodeling for endurance vs. resistance exercise.

S08: AEROBIC CAPACITY ASSESSMENT IN RUNNERS HISTORICAL REVIEW AND CONTEMPORARY APPLICATION
Eric O'Neal, Savanna Knight, Lynnsey Bowling. *University of North Alabama, Florence, AL.*

Over 100 years have passed since A.V. Hill's seminal exploration of oxygen consumption assessment in exercising humans. While the primary concept has remained virtually unchanged during this century of advancement, the techniques, technology, and even terminology to describe aerobic capacity have undergone significant changes. This symposium has been specifically tailored to the population most often investigated by the presenters (i.e. trained runners) but will provide helpful insight to any laboratory technicians or researchers conduct human model aerobic capacity assessment. A brief historical review will be provided concerning the development of early to modern day techniques, technology, and terminology associated with aerobic capacity assessment. The symposium will then transition into more nuanced discussion of topics such as determining VO_2 plateau, verification testing, secondary markers of test validity, max versus peak terminology, and impact of sampling interval duration choice. Finally, the authors will present a real-world application of these concepts in regards to data from actual samples of highly trained male and female runners from our laboratory.

S09: MAXIMAL OXYGEN UPTAKE: WHERE ARE THE LIMITATIONS?
Scott K. Powers, FACSM. *Stetson University, Deland, FL.*

Numerous studies have sought to identify a single limiting factor for maximal oxygen uptake. Most often, this limiting factor is identified as the ability of the cardiorespiratory system to transport oxygen to the exercising muscles with the greatest emphasis being on the pumping ability of the heart, especially its stroke volume. However, achieving maximal oxygen uptake challenges several physiological systems, representing multiple steps along the oxygen cascade from inspired air to muscle mitochondria. These steps include ventilation, pulmonary gas exchange, cardiac output/muscle blood flow/oxygen delivery, muscle gas exchange, and mitochondrial oxygen utilization. In this scheme, maximal oxygen uptake is established by every step operating at a requisite level, a concept that leads to the notion that control of maximal oxygen uptake is shared among all the steps, rather than necessarily being always being determined by a single step. Accordingly, the relative contributions of the steps may change across the spectra of age, health, and fitness, but the systems behavior of oxygen transport and utilization remains qualitatively the same in all cases. In other words, control is distributed along the pathway from lungs to contracting muscles. This symposium will 1) explain the idea of distributed control of maximal oxygen uptake (L. Bruce Gladden), 2) discuss the case for pulmonary limitation of maximal oxygen uptake in elite endurance athletes that exhibit incomplete pulmonary gas exchange during very heavy exercise (Scott K. Powers), and 3) explain how maximal oxygen uptake can be limited by peripheral factors within the muscle tissue (Alexander C. Berry). This symposium will appeal to a broad audience from basic scientists to those with applied interests.

S10: THE ROLE OF PHYSICAL ACTIVITY IN BLACK MATERNAL-FETAL HEALTH DISPARITIES: LITERATURE OVERVIEW
Marc Cook[1], Mikayla Greene[2], Linda May, FACSM[3]. *[1]North Carolina A&T State University, Greensboro, NC. [2]University of Tennessee, Knoxville, TN. [3]East Carolina University, Greenville, NC.*

Maternal mortality and morbidity rates disproportionately affect Black women in the United States. Recent data show that in the United States, specifically in the South, there is an increased prevalence of negative maternal and infant health outcomes. Across racial/ethnic groups, Non-Hispanic Black women (NHB) experience greater rates of infant mortality, maternal mortality, and morbidity. Furthermore, NHB women are more likely to suffer from gestational hypertension, preeclampsia, and hemorrhage. The presented evidence surrounding maternal health indicates the presence of racial health disparities. A health disparity is defined as "a preventable difference in the burden of disease, injury, violence, or opportunities to achieve optimal health". Physical activity (PA) has been cited to decrease health disparities in NHB pregnant and postpartum individuals. It is important to explore PA as a non-pharmaceutical means to combat increasing disparities. Dr. Cook will discuss maternal-fetal morbidity/mortality and outline physiological problems connected to NHB maternal health outcomes. Mikayla Greene will overview disparities in maternal mental health and the benefits of exercise for NHB maternal mental health. Dr. May will address the benefits of exercise and its role in attenuating disparities in pregnant NHB women. Researchers and practitioners will gain an understanding of the complexity of health disparities, current statistics/prevalence, and how PA can improve NHB maternal-fetal health. Researchers and practitioners should continue to focus on marginalized groups in PA interventions and tailor exercise recommendations for pregnant individuals.

S11: A NOVEL APPROACH TO MEASURING CONTEXT-SPECIFIC SEDENTARY BEHAVIOR: COMBINING ACCELEROMETRY WITH ECOLOGICAL MOMENTARY ASSESSMENT
Erik D. Hanson, FACSM, Jake C. Diana, Aiden J. Chauntry. *University of North Carolina, Chapel Hill, NC.*

Sedentary behavior (SB) is an independent risk factor for cardiometabolic disease (CMD). Similar to diet and physical activity, SB is multi-dimensional, and its impact on CMD risk likely varies depending on the context in which it occurs. For instance, literature thus far suggests that television viewing is more strongly associated with CMD risk compared to other forms of context-specific sedentary behaviors (CS-SB). This is likely due to simultaneous engagement with other unhealthy lifestyle behaviors, including processed food and alcohol consumption. Consequently, accurately measuring CS-SB is crucial for understanding the complex SB-CMD relationship and developing targeted interventions. Traditional methods for assessing CS-SB rely on retrospective self-reports, which are subject to recall bias and inaccuracies. To address these limitations, this symposium introduces a novel approach that combines accelerometry with ecological momentary assessment (EMA) to accurately capture context-specific SB data. By merging objective accelerometer data with contextual information obtained from EMA, this approach provides real-time insights into when, where, and with whom sedentary behaviors occur. It can also capture live data on other co-existing lifestyle factors, such as alcohol consumption and mental stress, that may cluster with certain CS-SBs. The primary aim of this symposium is to equip researchers with the knowledge and tools needed to implement this novel approach in their own research. Dr. Aiden Chauntry will discuss the significance of measuring CS-SB, its relationship with CMD risk, and the limitations of traditional methods. Jake Diana will detail the steps needed to integrate accelerometry and EMA, presenting preliminary data that demonstrates the feasibility and effectiveness of this approach. Dr. Erik Hanson will evaluate the strengths and limitations of our innovative approach, explore alternative methods, and propose strategies for optimizing data collection in future work. By introducing a more accurate method for measuring CS-SB, this symposium aims to lay the groundwork for further research into CS-SBs, and the development of targeted interventions to reduce CMD risk associated with sedentary behavior.
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S12: NEUROMODULATION AS A NON-TRADITIONAL TREATMENT IN RHEUMATOID ARTHRITIS DISEASE MANAGEMENT
Erica M. Marshall, Sara L. Terrell. *Florida Southern College, Lakeland, FL.*

Rheumatoid arthritis (RA) is a chronic, autoimmune disease leading to progressive joint damage that primarily impacts women. RA is known to reduce physical activity and increase cardiovascular disease risk. Although pharmacological interventions are traditional treatment avenues, neuromodulation techniques, are a promising therapeutic intervention. Transcutaneous vagal nerve stimulation (tVNS) is a method of neuromodulation that involves non-invasive stimulation of the vagus nerve through ear electrodes. The vagus nerve is a component of the parasympathetic branch of the autonomic nervous system, which regulates the immune and cardiac systems. Literature suggests that tVNS may restore autonomic nervous system balance in RA patients, as demonstrated by improvements in vagal measures of heart rate variability (HRV) and quality of life. This may increase physical activity behaviors and reduce cardiovascular disease risk. Therefore, the purpose of this symposium is to discuss the application and potential outcomes of using tVNS as an alternative RA treatment. Dr. Terrell will begin by discussing RA disease pathology and its impacts on health and physical fitness. Dr. Marshall will review neuromodulation and HRV measurement. Both Dr. Terrell and Dr. Marshall will provide a current summary of the relevant literature, as

well as considerations, and future directions in RA treatment utilizing tVNS. Additionally, they will report potential health benefits of tVNS and its use in conjunction with exercise. Both researchers and practitioners will gain valuable insights into the treatment challenges faced by RA patients and learn the potential benefits of neuromodulation. This symposium will facilitate discussions on how techniques like tVNS could be employed to improve patient outcomes.

S13: EXAMINING THE USE OF MUSIC TO ENHANCE ATHLETES' TRAINING SESSIONS, PRACTICES, AND COMPETITION PERFORMANCE
Andy Bosak. *Liberty University, Lynchburg, VA.*

Since the dawn of civilization, music has been a part of every society and culture. In terms of the relationship between music and sports, music has been a part of the Olympic Games since the first ancient games in Greece where rhythmic clapping and drumming often accompanied many events, such as running races. In the modern Olympic Games, music is a part of many events such as figure skating and the floor exercise in gymnastics. The cultural phenomena of music and sports are also a big part of many professional leagues such as the NBA, NHL, MLB, MLS, and collegiate athletics. However, the association of music with sports is not just for entertainment, but also to assist in the home crowd rallying behind and supporting their team as well as potentially increasing the athletes' performance. Furthermore, music has been utilized during training sessions in hopes that the athletes can train even harder and possibly improve future game day performance. This research review symposium will assess the use of music to improve exercise sessions and workouts as well as the impact of music on sport training and game day performance. The science, including an evaluation of related research studies, behind the connection between music and performance will be discussed and the potential negative impact of performance, such as over or under arousal as well as under vs over motivation, will also be explored. Suggestions of what type of music to use for training sessions for individual vs team sport settings will be given while the association with different types of music and game day performance will be reviewed. By potentially understanding which type of music to use during training sessions and competition, it is possible that greater future athletic performance may occur. Furthermore, the potential for further research studies associated with music and athletic performance is rather limitless.

Tutorials

T01: YOU CAN'T POUR FROM AN EMPTY CUP PART 2: A HOLISTIC APPROACH TO MANAGING SRESS.
Tamerah Hunt, FACSM, Amy Jo Riggs, Mary Beth Yarbrough. *Georgia Southern University, Statesboro, GA.*

According to Mental Health America, mental health is at the forefront of discussions with 19% of adults reporting a mental illness, which is equivalent to over 47 million Americans. Those who are dedicated to taking care of others' wellbeing often let their own mental health decline due to the stresses of work and personal life demands. In addition, healthy practices such as adequate sleep hygiene and proper nutrition, further exacerbate mental health decline. The purpose of this presentation is to discuss the importance of a holistic approach to mental health that includes appropriate sleep hygiene, nutrition and self-care to mitigate burnout and reduce stress into one's general practice and everyday life. Dr. Tamerah Hunt, Marybeth Yarbrough, and Dr. Amy Jo Riggs will discuss strategies to improve mental and overall health such as 1) hands-on demonstrations of mindfulness strategies that can be incorporated into daily activities, 2) proper sleep hygiene at home and on the go 3) nutrition to feed the body and the spirit at home and on the go 4) and generalized strategies to manage stress. Learning objectives: After completing this session, attendees will: a) understand the intersectionality of sleep, nutrition and self-care to create overall well-being b) apply strategies to improve health and mental health and c) develop a personal plan to decrease stress in the home and on the go.

T02: LEAD THE WAY LEADERSHIP THROUGH PEER REVIEW AND OPEN SCIENCE WITH ACSM'S ESM JOURNAL
Katrina D. DuBose, FACSM. *East Carolina University, Greenville, NC.*

Becoming a skilled and effective manuscript reviewer is a crucial step towards joining a journal's editorial board, attaining the role of Associate Editor, or advancing to the position of Editor-in-Chief. This tutorial aims to equip graduate students, post-doctoral scholars, and early career assistant professors with the essential skills and knowledge to conduct effective peer reviews of journal articles, thereby paving the way for future career opportunities. During the session Dr. DuBose will include practical activities focused on the peer review process within the specific context of ACSM's journal, Exercise, Sport, and Movement (ESM). Additionally, the tutorial will explore ESM's commitment to open science principles and their influence on contemporary publishing practices. After attending this tutorial the attendee will be able to: 1. Describe the peer review process for journal articles; 2. Discuss the importance and principles of open science; 3. Incorporate best practices into their manuscript review process; and 4. Evaluate how open science principles could fit within their research agenda.

T03: EXERCISE PHYSIOLOGY IN 50 MINUTES
Edward T. Howley, FACSM. *University of Tennessee, Knoxville, Knoxville, TN.*

Dr. Edward T. Howley is a past president of ACSM, but most importantly, he is a master teacher. Every year hundreds of new attendees, many of whom are students, come to the annual SEACSM meeting. Dr. Howley has delivered this highly entertaining summary at past national ACSM meetings, but he has never presented it at SEACSM. His updated presentation, like his previous ones, will cover in clear language and illustrations, the breadth of exercise physiology in a way that will motivate and excite the audience long after the lecture is past. Dr. Howley's presentation will engage all new attendees, especially students, likely many physicians, and, at the same time, once again enthrall those who may have heard it before. One of the most important components of the annual meeting that students obtain, is an appreciation for the culture of ACSM's and SEACSM's broad research and professional base. They learn that they are not studying in isolation but instead that they are part of a universal set of objectives related to the science and practice of exercise physiology/physical activity/movement. This presentation is the epitome of SEACSM/ACSM conference experiences that tie attendees together and induct students into the overall enterprise of our organization. Some sports medicine physicians "come to" their practices from fields other than exercise physiology. In other words, they may be learning exercise physiology on their own. This lecture provides a stimulating overview that is easily digested and is highly informative about the breadth of exercise physiology.

T04: RESISTANCE TRAINING IN ONCOLOGY: DESIGNING AND DELIVERING EFFECTIVE PROGRAMS FOR CANCER SURVIVORS
Alexander M. Brooks, Kenneth S. Anderson, Kylah E. Jackson, Ciaran M. Fairman. *University of South Carolina, Columbia, SC.*

As the number of cancer survivors continues to grow, there is an increasing demand for accessible exercise oncology programs specifically addressing the functional impairments commonly experienced by these individuals. Despite the need for these specialized exercise oncology programs, a significant gap remains between existing research and practical implementation of programs in the community. Numerous studies have established the safety and efficacy of exercise interventions for cancer survivors, yet these findings have not yet been effectively integrated into standard care practices within many healthcare systems. This tutorial will focus on the design and implementation of a successful community exercise oncology program, in addition to advances in resistance training methodology applied to this population. Mr. Brooks will outline the program, emphasizing how collaborations between university exercise science programs and hospital systems can facilitate meaningful service-learning opportunities that benefit both students and community members. Mr. Anderson will cover fitness assessment and exercise prescription within community oncology settings, outlining practical strategies for both in-person and virtual delivery. Ms. Jackson will introduce Repetitions in Reserve (RIR) as a novel method for prescribing resistance exercise intensity. Learning objectives for this session include: 1) Understanding key considerations for designing

effective community exercise oncology programs; 2) Enhancing practical skills in creating individualized exercise programs that specifically address the diverse challenges faced by cancer survivors; and 3) Gaining proficiency in various intensity prescription methods, including RIR, which may significantly improve participant outcomes. By the end of the session, participants will leave with actionable strategies to 1) engage the oncology community in building exercise oncology programs and 2) refine their coaching practices, to promote, functional ability and quality of life for cancer survivors. The target audience for this session includes practitioners, researchers, and students working with oncology or clinical populations, all seeking to deepen their knowledge and skills in exercise programming.

T05: MEASURING PERIPHERAL ULTRASOUND BLOOD FLOW: WHY, WHEN, AND HOW?

Daphney M. Carter[1], J Grant Mouser[2], Matthew B. Jessee[3]. *[1]Kennesaw State University, Kennesaw, GA. [2]Troy University, Troy, AL. [3]University of Mississippi, Oxford, MS.*

Measuring peripheral blood flow, via doppler ultrasound, is a practical and non-invasive approach for assessing the cardiovascular system, which is necessary as cardiovascular disease continues to be the number one cause of death in the world. Utilizing doppler ultrasound can provide valuable information, such as functional or post-occlusive reactive hyperemia, which are indicative of cardiovascular health and function. While researchers are currently utilizing doppler ultrasound to measure peripheral blood flow, there are a lack of commonalities in protocols, data acquisition, and data analyses, which present a barrier for integrating information and/or learning to use the measures in one's own research. Conducting doppler ultrasound requires skill development but can be done with good reliability following training and practice. Most assessments typically require a measurement of resting blood flow, which then gets compared to blood flow in response to a given stimulus. Some common tests utilized include a cold pressor test, flow-mediated dilation, nitrate administration, or muscle contraction. Administration of these tests, while common, still vary in their protocols, data acquisition, and data analysis. Thus, the purpose of this presentation is to inform the general audience of the practical measurement of peripheral blood flow and how this could be implemented in research or curriculum. Dr. Mouser will discuss the background of measuring peripheral blood flow and the development of this technique. Dr. Carter will demonstrate the collection of ultrasound blood flow and utilize Open Access Software for data acquisition. Dr. Jessee will discuss the data analysis and practical application of this technique. The learning objectives are to a) determine whether blood flow analysis is a useful tool or addition to your laboratory b) recognize best practices and considerations for using doppler ultrasound c) describe the process of acquiring blood velocity using doppler ultrasound d) analyze a blood flow video using Open Access Software (FloWave.US) and e) apply different analyses to blood velocity data. The target audience for this tutorial will be researchers, faculty, and students who may be interested in practical non-invasive measurements of the cardiovascular system.

T06: PULLING BACK THE CURTAIN ON ACADEMIA AND RESEARCH: UTILIZING MENTORSHIP AS A CRITICAL TOOL

Katherine A. Collins[1], Audrey M. Collins[2], Emmaline M. Denton[1], Sarah Fretti[3], Nicole K. Rendos[4], Mark A. Schafer, FACSM[5], Elizabeth S. Edwards, FACSM[6], R. Lee Franco, FACSM[7], Rebecca M. Kappus, FACSM[8], Danielle D. Wadsworth, FACSM[9], Rebecca A. Battista, FACSM[8]. *[1]Duke University School of Medicine, Durham, NC. [2]Advent Health, Orlando, FL. [3]University of Central Florida, Orlando, FL. [4]Emory University, Atlanta, GA. [5]Western Kentucky University, Bowling Green, KY. [6]James Madison University, Harrisonburg, VA. [7]Virginia Commonwealth University, Richmond, VA. [8]Appalachian State University, Boone, NC. [9]Auburn University, Auburn, AL.*

The industry of academia can feel complex and overwhelming, with no roadmap to guide trainees. A mentor - an experienced and trusted adviser - can be critical for helping to demystify academia and guiding trainees to achieve their goals. Without mentors, trainees may feel they are unable to maneuver the uncharted waters of academia, thereby limiting the career potential of the next generation of researchers and educators. Thus, on behalf of the Emily M. Haymes Mentoring Committee the purpose of this tutorial session is to 1) provide a student perspective on navigating what comes next after graduation and how to make the most out of being a mentee; 2) provide an early-career/junior faculty perspective on the importance of identifying mentors and how to establish a mentoring team; and 3) provide a mid- to later-career perspective on how to mentor different career stages, the mentor/mentee relationship, and what mentees add to a mentor's career. Panelists' career stages range from student and early career faculty to professor. After participating in this tutorial session, attendees will be able to 1) demonstrate familiarity with academia and research; 2) identify a strong mentor and mentoring team as they move through their career stages; and 3) understand the key skills of being a strong mentor and fostering a strong mentor/mentee relationship. As utilizing mentorship is a key component across all career stages - similar to the newly established Mentor Pairing Program - the target audience for this tutorial session ranges from undergraduate students to faculty members.

T07: RECOMMENDED MODIFICATIONS TO THE PHYSICAL ACTIVITY GUIDELINES FOR ADULTS

James S. Skinner, FACSM. *Indiana University, Bloomington, IN.*

During the 1990s, epidemiological research showed a marked decrease in mortality risk when comparing the least active quintile with the second and third quintiles. While the public health message was clear (i.e., any activity is better than none), there has not been a good explanation of why this rapid drop occurs. Without having a good explanation, it is difficult to be specific about what sedentary people should do. Looking at research findings from the perspective of the physiology of exercise and inactivity, it is possible to understand why this occurred and allows for the following recommendations. Very inactive people should be less inactive and more active. Active people should also reduce their inactivity for extra benefits. Intensity of exercise is more closely associated with reduced mortality than the volume or mode of activity. People should do more vigorous aerobic and strength exercise. People should not allow more than two days to elapse between exercise sessions a) to improve insulin sensitivity and glucose tolerance and b) to activate lipoprotein lipase to reduce postprandial lipemia.

T08: YOU JUST GRADUATED. NOW WHAT? A GLIMPSE AT CAREERS IN INDUSTRY

Nicole K. Rendos[1], Christopher M. Wilburn[2], Bahman Adlou[2], Alana J. Turner[3], Aaron Griffith[4], Mariana V. Jacobs[5], Michael A. Samaan[5]. *[1]Emory University, Atlanta, GA. [2]Auburn University, Auburn, AL. [3]Coastal Carolina University, Conway, SC. [4]Mississippi State University, Mississippi State, MS. [5]University of Kentucky, Lexington, KY.*

Careers pursued by students with degrees in exercise science and related fields commonly involve client and patient-focused careers including those of a certified exercise physiologist (ACSM-EP), certified strength and conditioning specialist (CSCS), certified athletic trainer (ATC), registered dietician (RD), and personal trainer. Careers in industry are less frequently pursued, largely due to a lack of awareness around job opportunities. Members of the SEACSM Biomechanics Interest Group (BIG) Executive Board will host a panel discussion with industry representatives from Theia Markerless, Inc., novel electronics inc., Vicon Motion Systems Ltd., and Motion Analysis Corporation. Students will learn from industry representatives what types of positions are available in industry, including sales, technical support, and research and development. Industry representatives will discuss what the requirements are for each type of position, how to identify open opportunities, and what companies are looking for when hiring. They will discuss what the day-to-day jobs entail, and personal experiences working in the industry setting. Additional topics will include both in-person and online networking strategies to strengthen chances of success in hiring. The target audience for this panel discussion will be undergraduate, master's, and doctoral students who will be pursuing job opportunities upon graduation.

T09: A GUIDE FOR TRANSITIONING FROM DOCTORAL STUDENT TO TENURED PROFESSOR

Samantha L. Johnson[1], Thomas L. Andre[2], Eric K. O'Neal[3]. *[1]Middle Tennessee State University, Murfreesboro, TN. [2]The University of Mississippi, Oxford, MS. [3]University of North Alabama, Florence, AL.*

On paper, tenure often appears as an objective process that should be easily evaluated by looking at an applicant's teaching, research, and service from a well-prepared vita. In reality, there are many factors outside the laboratory or classroom that could impede your goals in higher education that are not often discussed openly during graduate studies or within a tenure applicant's department. This tutorial is targeted at doctoral students or faculty members currently seeking

tenure in higher education. The three presenters will share their personal experiences and provide practical tips to help attendees gain a better understanding of soft skills and sound strategies that will increase your chances of attaining tenure status. The speakers come from a wide spectrum of academic institution types including an R1 state flagship university, an R2 state university with over 20,000 students, and a regional comprehensive university. Three major themes will be covered during the presentation including the following: developing a personal mission statement to live into, strategic bandwidth allocation throughout the academic year, and effectively responding to conflict. The presenters hope this tutorial will facilitate considerable interaction and provide attendees an opportunity to ask questions they might not be confident expressing in other settings.

T10: THE HEART OF THE MATTER: IMPLEMENTATION OF PHASE THREE CARDIAC REHAB IN LOW SES COMMUNITY

Rebecca R. Collins, Margaret Jenkins, Julie Reams, Marybeth Yarbrough, Amy Jo Riggs, Tamerah Hunt, FACSM. *Georgia Southern University, Statesboro, GA.*

Bulloch County ranked 1st out of 119 counties in the number of cardiovascular deaths in RURAL counties in 2023 according to OASIS, illustrating a clear disparity in cardiovascular health within the community. To meet this critical need Georgia Southern University partnered with the Statesboro YMCA and East Georgia Regional Medical Center to create a free Phase Three Cardiac Rehabilitation Program. Through facility sharing, graduate assistants, interns, student volunteers, partners through the local hospital, and the staff at the local YMCA, this free program helps to bridge the gap between graduating from Phase 2 Cardiac Rehab and returning to regular physical activity for patients. Cost and access are leading barriers to communities offering this service and through grant writing, service learning from students, and community fundraising, no patient is turned away. Additionally, students receive excellent hands-on experience with motivational interviewing and exercise programming and prescription for chronic disease populations with faculty supervision. The purpose of the presentation is to highlight the importance of partnership building which leverages community resources to provide phase three cardiac programs and other similar programs using the same strategies. Rebecca Collins will discuss partnership building between the three institutions and strategies for maximizing mutually beneficial services to benefit students. Dr. Hunt and Mary Beth Yarbrough will discuss fundraising strategies for implementing the program. Margaret Jenkins and Julie Reams will discuss the pre- and post-testing for patients and strategies for exercise programming and the transition to full gym membership and exercise adherence. After completing the session, attendees will: 1) understand available strategies for building mutually beneficial partnerships including sample student learning outcomes and intern responsibilities, 2) develop a needs assessment for fundraising in their own respective locations, and 3) experience a very brief version of the Fullerton Senior Fitness Test and Scoring to understand ease of implementation. Handouts and links to resources will be provided.

T11: JIGSAW LEARNING IN KINESIOLOGY: IS THE JUICE WORTH THE SQUEEZE?

Kate Early, Josie Williams. *Columbus State University, Columbus, GA.*

Today's students often struggle to engage in the classroom for a variety of reasons including lack of preparation, lack of incentive, or fear and anxiety. In structural kinesiology, a course required by many undergraduate exercise science/kinesiology programs, students are faced with large volumes of content and the complexity of musculoskeletal anatomy. The subject requires students to integrate anatomy, physiology and biomechanics as well as apply concepts to practical situations such as analyzing movement patterns. Both memorization and critical thinking are necessary to visualize anatomical structures and how movement is generated. Together, students can easily become overwhelmed and disengaged losing sight of the value of learning kinesiology as it pertains to their future careers. Despite traditional lecture-based courses still dominating higher education, the Jigsaw method is a promising approach to student learning and engagement. The Jigsaw method also enhances teamwork and communication which are sought after soft skills. The purpose of this presentation is to discuss the implementation of the Jigsaw method in the context of kinesiology and its effectiveness in student outcomes. We will explore how to evaluate Jigsaw learning and determine if the juice is worth the squeeze. The learning objectives are to 1) promote cooperative learning strategies to increase student engagement; and 2) provide a framework for Jigsaw learning in the fields of kinesiology and exercise science. The target audience for this tutorial will be faculty who are interested in incorporating active learning into their classroom as a mode of teaching.

T12: MAKING EIM-OC TRANSLATIONAL: EXPANSION OF INTERVENTIONS AND PROGRAMMING

Patricia W. Bauer[1], Rebecca A. Battista, FACSM[2]. *[1]Florida Gulf Coast University, Fort Myers, FL. [2]Appalachian State University, Boone, NC.*

Exercise is Medicine On Campus (EIM-OC) programs can have a direct effect on physical and mental health as well as academic success of university students through the power of movement. Since its beginning, the number of participating institutions has increased, providing insights and creating information for new programs. Expanding EIM-OC referral networks, intervention-related data collection and programming can increase program impacts adding to its translational value to universities and their surrounding communities. The purpose of this symposium is to discuss current literature in relation to intervention and program-related experiences as well as provide implementation, functional, and financial recommendations for faculty, practitioners, and students interested in creating, expanding, and/or sustaining EIM-OC programs on their campus. In this session, presenters will discuss the current literature regarding EIM-OC effectiveness, provide best practices for starting and expanding programs, including sharing their campus referral networks, programming, intervention ideas, and tools for assessing program effectiveness. Objectives include listing campuses within the SEACSM region registered with EIM-OC, exploring the systematic collection of data on EIM-OC interventions that link physical activity participation with measurable outcomes, and increasing the reach of EIM-OC across the SEACSM region.

T13: THE IMPORTANCE OF EXERCISE: PROMOTING PHYSICAL ACTIVITY TO OUR FUTURE CLINICIANS

Rebecca M. Kappus, G. Jack Scroggs, Rebecca A. Battista, FACSM. *Appalachian State University, Boone, NC.*

Interprofessional educational opportunities have been gaining ground in health and exercise science related programs. While those in exercise physiology courses, such as exercise testing and prescription, understand the importance and value of exercise on preventing and treating chronic disease, others in health-related fields often are not as well versed. There is limited to no coursework and no training in programs such as nutrition, physician's assistant, or medical programs despite the efficacy in utilizing exercise as medicine. With the increasing emphasis on promotion of physical activity through referral mechanisms and certification registries, educating future health care professionals is critical. Additionally, students benefit greatly from practical experiences and innovative teaching methods. Creating opportunities for students with hands-on learning opportunities, facilitating competency development, and encouraging collaboration among those entering other health care professions can promote physical activity participation and help increase the health of Americans. The purpose of this tutorial is to explore three different ways to promote physical activity interventions with students entering health care professions. The tutorial will focus on the following topics: (1) novel teaching methods employed in clinical exercise physiology and prescription classes; (2) student perspective on working with clients and applying course content; and (3) collaborating with Physician Assistant Program to introduce Exercise is Medicine and other concepts about physical activity and nutrition into a certificate program. Attendees will leave with strategies offering practical experiences in courses and programs that build students' competence in applying exercise prescription and interventions in clinical settings, benefiting future clinicians and their patients.

T14: INCORPORATING CASE STUDY RESEARCH INTO AN UNDERGRADUATE EXERCISE SCIENCE PRACTICUM COURSE

Lauren R. Tapp. *Georgia Gwinnett College, Lawrenceville, GA.*

Case study research in exercise science can be a valuable tool for undergraduate students to acquire a foundation of applied research. Since many undergraduate students can find traditional research and interpreting statistical analyses to be overwhelming, case studies allow students the opportunity to perform their own research without the need for a large number of subjects or complicated analyses. When

combining case study research with a practicum course, students can apply and enhance their practical skills while learning the value of applied research. The purpose of this presentation is to discuss the process of embedding a case study research component within a capstone exercise science practicum course. Topics that will be discussed include initiating and implementing a practicum course, embedding a case study research component, assessing student outcomes, and potential obstacles. This presentation will help exercise science faculty and academic program leaders navigate the process of implementing or modifying a practicum course at their home institutions with the option to add a case study research component.

T15: MENTORING MUST-HAVES: A ROAD MAP TO LEARNING-CENTERED MENTORING

Jennifer Caputo, Samantha Johnson, John Hagan. *Middle Tennessee State University, Murfreesboro, TN.*

Mentoring is a high-impact practice that is mutually beneficial to mentors and mentees. This tutorial will introduce attendees to a learning-centered mentoring paradigm. This session is appropriate for those interested in serving as a mentor and those seeking a mentor. It will contain an overview of the mentoring cycle from starting to ending partnerships. Participants will be guided in evaluating their strengths as potential mentors and assessing potential mentoring relationships. Attendees will also learn the components of successful mentoring partnerships and the value of mentoring agreements. By attending this tutorial, participants will be better prepared to enter mentoring relationships, leading to better outcomes for mentors and mentees. The presenters will all orally contribute to the presentation of this topic, with faculty perspectives provided by Jennifer Caputo and Samantha Johnson and a student perspective provided by John Hagan.

T16: MODERN SPORTS NUTRITION SUPPLEMENTS: GAME CHANGING, ALL HYPE, OR SOMEWHERE IN BETWEEN?

Patrick Benjamin Wilson. *Old Dominion University, Norfolk, VA.*

Nutrition supplements have a long history of use in sport. Recently, several new products have been developed and are being marketed as scientifically-tested, game-changing sports nutrition supplements. The three examples that will be discussed in this presentation are: 1) carbohydrate hydrogels, 2) sodium bicarbonate delivered via mini-tablets and a hydrogel, and 3) a probiotic containing the lactate-metabolizing bacterium *Veillonella atypica*. Dr. Wilson will review the physiological rationale for each supplement. In addition, available evidence on the efficacy each supplement will be discussed and compared to marketing claims. Learning objectives of this presentation include 1) increasing awareness of the evidence base (or lack thereof) for each supplement, 2) discussing the potential pros and cons of using each product type, and 3) discussing real-life scenarios for which each supplement could potentially provide performance advantages.

T17: FROM CLASSROOM TO CAREER: RESEARCH METHODS IN KINESIOLOGY FOR WORKFORCE READINESS

Debra Stroiney, Salvatore Ferranti. *George Mason University, Manassas, VA.*

This tutorial session will present information to instructors on how to revise a research methods course, making it relevant to undergraduate students entering the workforce while still preparing students interested in research intensive graduate programs. Data and lesson plans will be presented on a recently revised research methods course. An emphasis is placed on science communication, evidence-based practice, and career preparation skills. This includes apps and tools that could be used to improve student learning experiences. Example activities, assignments, and student learning outcomes will be presented. Data will be presented on student success when comparing the previous version of a research methods course to one focused on communication and course evaluation feedback. The learning objectives for this session will be: 1. Examine the benefits of teaching undergraduate Kinesiology students how to communicate science to the public; 2. Understand the needs of undergraduates as they enter the workforce in terms of research methods and evidence-based practice; 3. Evaluate the effectiveness of new assignments in research methods emphasizing communication of science to the public and evidence-based practice; 4. Discuss new ideas and innovations which can be applied to an attendee's current curriculum. Attendees will learn how to revise their courses to integrate career skills, such as science communication, alongside traditional research protocols and methods. They will also learn to develop and integrate evidenced-based practice assignments in their courses. Author contributions: Dr. Stroiney will prevent the evidence for the importance of this curriculum, as well as the learning materials and assignments. Mr. Ferranti will present the data that was collected and analyzed on student success.

T18: EXERCISE TESTING AND PRESCRIPTION FOR MAN'S BEST FRIEND: A NEW ROLE FOR EXERCISE SCIENTISTS

Heidi A. Kluess, FACSM. *Auburn University, AUBURN, AL.*

Fitness testing and training for pet dogs is a growing area in exercise science. People are connected to their dogs more than ever and are concerned about dog health, longevity, and sports performance. Because dogs live in human households, they are subject to the same lifestyle and inactivity issues that humans experience like obesity, arthritis and diabetes. There is also a large and growing dog sports community that is interested in developing strength and conditioning for sports performance and preventing injuries. Exercise testing and prescriptions for dogs are still in its infancy. There are a number of high-quality certifications for becoming a canine fitness trainer including the University of Tennessee Certified Canine Fitness Trainer program, North Carolina State University's Canine Strength and Conditioning Coach, and Fenzi Dog Sports Academy's Certified Professional Canine Fitness Trainer. Attendees will learn about the application of exercise science to pet dogs, the populations of dogs that participate in canine fitness (obesity, arthritis, aging, sports), examples of how we currently fitness test and train dogs, and information about the certifications available. The target audience is students of exercise science. About the presenter: Dr. Heidi Kluess, Ph.D., FACSM, CCFT is a dog sports enthusiast and has been a Certified Canine Fitness Trainer since 2019. Her research focuses on human and dog fitness, obesity and sports.

Oral Presentation Sessions

O101: LIPOPROTEIN CHOLESTEROL AND PARTICLE DISCORDANCE: ASSOCIATIONS WITH EXERCISE INDUCED CARDIOVASCULAR DISEASE RISK FACTOR CHANGES

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Background: Differences between lipoprotein cholesterol and particle concentration (lipoprotein discordance) have been associated with risk for cardiovascular disease (CVD) as well as multiple CVD risk factors. However, the relationship between baseline lipoprotein discordance and exercise induced changes in CVD risk factors is sparse. Thus, our study aimed to investigate the association between baseline lipoprotein discordance and exercise induced changes in multiple CVD risk factors among adults with type 2 diabetes. **Methods:** We analyzed data from the exercise groups of the HART-D trial where participants were randomized into one of three training groups (Aerobic, Resistance, or Combination; N=180, 62.2% female total for all training groups) for 9 months. Standard lipid panels, and lipoprotein subclass profiles were measured pre and post intervention. Lipoprotein cholesterol and particle concentrations were rank ordered into sex specific percentiles. Lipoprotein discordance was defined by subtracting the lipoprotein particle percentile from lipoprotein cholesterol percentile. Associations between baseline continuous lipoprotein discordance and exercise induced changes in CVD risk factors were assessed via multivariable linear regression adjusting for age, race, sex, baseline BMI, cholesterol medication, and baseline trait. **Results:** Baseline continuous HDL discordance was significantly (all $p<0.05$) associated with exercise induced changes in 1) triglycerides (Parameter estimate (PE) = -0.515), 2) continuous HDL discordance (PE = -0.273), 3) mean HDL-P size (PE = 0.003), 4) total and 5) large HDL-P (PE = 0.016 and 0.007 respectively) and 6) small LDL-P concentrations (PE = -2.163). Continuous LDL discordance was significantly ($p<0.05$) associated with exercise induced changes in

continuous 1) LDL discordance (PE = -0.495), 2) LDL-C concentration (PE = -0.266), and 3) body fat (PE = -0.014). No training group or interaction effects were found. **Conclusion:** Among individuals with type 2 diabetes, baseline lipoprotein discordance is primarily predictive of exercise induced changes in lipoprotein cholesterol and particle-based metrics. Lipoprotein discordance may not be a valuable predictor of exercise induced changes in common CVD risk factors outside of lipoprotein metrics.

O102: COMPARISONS OF OBSTRUCTIVE SLEEP APNEA AND CARDIOVASCULAR HEALTH INDICES AMONGST CHRONOTYPES

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BACKGROUND: Chronotype is characterized by individual preferences in the timing of sleep and activity across a 24-h cycle. Health differences between chronotypes have been identified but are not fully understood. Thus, the aim of this study was to investigate differences in the presence and severity of obstructive sleep apnea (OSA) and cardiovascular health indices amongst morning, evening, and intermediate chronotypes. **METHODS:** This study is part of a larger, on-going investigation. Preliminary analyses include a subsample of 98 adults (52% women, 60% white) from the Southeastern US who underwent a series of assessments (e.g., height, body mass, and noninvasive measures of central systolic and diastolic blood pressure [cSBP and cDBP]) all performed in the morning following an overnight fast. The Circadian Energy Scale (CIRENS; -4 to +4, with higher scores indicating evening chronotype) was used to determine chronotype. Participants also completed a home sleep study to evaluate the presence and severity of OSA, quantified using the apnea hypopnea index (AHI; number of apneas plus hypopneas/h of sleep) and categorized as <5, 5-14.9, 15-29.9, and ≥30 events/h of sleep. Analysis of covariance (ANCOVA) was used to explore differences in the presence and severity of OSA and differences in cSBP and cDBP amongst chronotypes. **RESULTS:** Participants (M±SD: age=36±11 y, body mass index [BMI]=28.5±7.6 kg/m^2, cSBP/cDBP=106.7±13.3/72.6±8.7 mmHg) tended to present with an intermediate chronotype (83.7%) and had AHI severity scores of 9.6±12.6. AHI scores differed significantly between chronotypes ($F(1,2)=5.5$; $p=0.005$), which remained significant after controlling for age and BMI ($F(1,4)=4.6$; $p = 0.035$). Similarly, cSBP significantly differed between chronotypes ($F(1,2)=3.6$; $p=0.033$), however these differences were diminished after controlling for age and BMI ($F(1,4)=1.7$; $p=0.189$). **CONCLUSIONS:** Differences in OSA severity differed by chronotype, independent of age and BMI, and were highest among individuals with an intermediate chronotype. In contrast, differences in cSBP were attributable to age and BMI and not chronotype *per se.* Further investigation into chronotype (and associated physiological and behavioral manifestations) is warranted to better understand long-term health implications.

O103: EFFECT OF A BRIEF BOUT OF POST-RESISTANCE TRAINING CYCLING EXERCISE ON AORTIC STIFFNESS

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BACKGROUND: Resistance training (RT) has been shown to increase aortic stiffness both acutely and chronically, whereas endurance training (ET) tends to reduce it. However, RT-focused individuals may avoid prolonged ET bouts due to lack of training specificity or concerns of interference effects, highlighting the need to investigate the effects of shorter ET protocols on central arterial compliance. Thus, we aimed to determine whether a brief bout of ET performed post-RT attenuates acute increases in aortic stiffness. METHODS: Twelve men (23.2 ± 3.8 years, 26.7 ± 3.4 kg/m^2, 4.1 ± 2.0 years of RT experience) performed identical bouts of RT on separate days with and without 10 min of post-RT ET on an air bike (70% of age-predicted maximal heart rate) in a counterbalanced order. The RT protocol involved 5 sets of 5 repetitions of the bench press (95% of 5 repetition maximum [RM]) and 5 sets of 10 repetitions of the arm curl (95% of 10 RM). Carotid-femoral pulse wave velocity (cfPWV, an index of aortic stiffness) was obtained in the supine position following 5 min of stabilization immediately pre-RT, immediately post-RT, and again 5-, 15-, and 30-min post-ET intervention or control (10 min seated rest). RESULTS: A significant main effect of time was observed for cfPWV ($P < 0.0001$). Post-hoc analyses showed that cfPWV immediately post-RT (6.0 ± 0.7 m/s) was greater (Ps <0.0001) than all other time points (5.5 ± 0.6 - 5.6 ± 0.6 m/s). No condition ($P = 0.74$) or condition × time interaction ($P = 0.16$) effects were observed. Following the ET intervention, greater reductions in cfPWV at post-30 relative to immediately post-RT were associated ($r = 0.732$, $P < 0.01$) with lower relative cycling power output (W/kg). CONCLUSIONS: A brief bout of moderate intensity ET did not alter group-level aortic stiffness responses post-RT. However, the ET intervention was more effective in reducing cfPWV among participants with lower cardiorespiratory fitness, inferred from relative cycling power output. Funded by the National Strength and Conditioning Association Graduate Student Research Grant-Masters

O104: EXERCISE TRAINING ATTENUATES AGE-RELATED INCREASES IN 10- AND 30-YEAR CVD RISK: HERITAGE FAMILY STUDY

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BACKGROUND: Current guidelines recommend atherosclerotic cardiovascular disease (ASCVD) risk assessment using 10-year risk equations for adults aged 40-79 years and 30-year risk in those under 40. Exercise interventions are known to improve the traits influencing ASCVD, but less is known of their impact on predicted ASCVD risk. Therefore, we investigated the impact of exercise training on ASCVD risk scores. METHODS: A total of 695 physically inactive participants free of CVD (57% female, 35% Black, 17-65 years old) completed 20 weeks of endurance training. The traits used to calculate the ASCVD risk scores (e.g., age, systolic blood pressure, and HDL and total cholesterol) were collected before and after training. Paired t-tests were used to examine training effects on 10-year ASCVD risk for participants over 40 years old (n=256) and 30-year risk for those under 40 (n=439). The pooled cohort risk equation was used to calculate 10-year risk, and the Framingham equation was used to calculate 30-year risk. RESULTS: In HERITAGE, a 20-week increase in age only on average would significantly ($p<0.0001$) increase 10- and 30-year risk by 0.13% and 0.24%, respectively. The combined changes in age and traits during the training period resulted in a non-significant 10-year risk decrease of 0.05% ($P=0.40$). If age was held constant, the change in traits alone would result in a significant decrease of 0.17% ($p<0.0001$) in 10-year risk. Similar trends were observed for 30-year risk. The combined changes in age and traits resulted in a non-significant decrease of 0.02% ($p=0.79$), whereas if age was held constant, the changes in traits would result in a 30-year risk decrease of 0.25% ($p=0.001$). CONCLUSION: Our study suggests that exercise training did not reduce predicted ASCVD risk in young to middle aged adults, but did counteract the age-related increase in risk. Therefore, regular exercise may be beneficial for decreasing long-term ASCVD risk, even in younger and healthy populations. This may have implications for prevention and treatment in clinical and public health settings. Since regular exercise is recommended to reduce ASCVD risk, risk equations that incorporate exercise, physical activity, and/or fitness metrics should be developed.

O105: EFFECT OF LIFESTYLE CHANGES ON LEFT VENTRICULAR STRUCTURE/FUNCTION IN PATIENTS WITH HEART FAILURE

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BACKGROUND: Heart failure with preserved ejection fraction (HFpEF) is characterized by diastolic dysfunction and a left ventricular (LV) ejection fraction of ≥ 50%. The prevalence of HFpEF continues to rise, typically presenting in patients with multiple comorbidities including obesity, age, and metabolic disorders. Despite the growing prevalence of HFpEF, little is known about the impact of lifestyle interventions on left ventricular structure and/or function measures. The SECRET I study evaluated the impact of 20 weeks of aerobic exercise training (AET) and/or a caloric restricted diet (CRD) on quality of life and exercise capacity in 100 elderly overweight patients with HFpEF. **METHODS**: Participants were randomized to one of four groups; control (CON), AET, CRD, or CRD + AET. Peak exercise oxygen consumption (VO2 peak) was determined during cardiopulmonary exercise test (CPET). Total body lean mass and fat mass were measured by dual energy x-ray absorptiometry (DEXA). Left ventricular structure and function measures were assessed by cardiac MRI. Outcome measures were obtained by blinded evaluators at baseline and after the 20 week intervention. Statistical analyses determined that both AET and CRD resulted in significant improvement

in VO2 peak yet only the two groups receiving CRD lost significant amounts of body weight and bodyfat. Preliminary findings from SECRET 1 suggest that neither AET, CRD, nor combinations of CRD + AET had any significant impact on resting cardiac MRI or Doppler echocardiography measures. Correlational analyses will be used to further evaluate the relationship between changes in exercise capacity and bodyweight/fat and LV structure and function measures in SECRET 1 participants. **ANTICIPATED RESULTS:** We hypothesize that participants experiencing the largest amount of weight/fat loss during SECRET 1 will have the greatest change in LV structure and function measures. In contrast, we do not expect a significant relationship between change in exercise capacity on LV structure and function measures.

O106: EFFECTS OF EXERCISE INTENSITY ON DIASTOLIC FUNCTION IN BREAST CANCER PATIENTS UNDERGOING CHEMOTHERAPY

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INTRODUCTION: Breast cancer (BC) chemotherapy is associated with diastolic dysfunction. Exercise improves diastolic function in patients with heart failure, but its effects have yet to be demonstrated in patients receiving chemotherapy for BC. PURPOSE: To examine the effects of high-intensity interval training (HIIT) and moderate-intensity exercise training (MOD) on diastolic function following chemotherapy in women with breast cancer. METHODS: Twenty-four patients with BC scheduled to undergo chemotherapy were randomized to 1) HIIT or 2) MOD. Patients underwent 2D echocardiography (to assess diastology) and VO2peak testing 1-2 weeks prior to starting chemotherapy to establish peak HR (PHR) for exercise prescription. Exercise training began 1-2 weeks prior to treatment. HIIT consisted of 3-sessions/week of 4x4 minute intervals at 85%-95% PHR interspersed with 3-minute recovery intervals on a recumbent bicycle. MOD consisted of 150 minutes of walking at 70-75% PHR each week. The first 2 exercise sessions were supervised followed by remote monitoring for the rest of the study. Post-testing occurred within 3-10 days after the last treatment. After assessing for normality, between group differences in deltas was compared using an independent samples t-test, within-group differences were assessed with a paired t-test and α set at 0.05. RESULTS: Fifteen patients completed all aspects of the study (HIIT: n=7, 55.3±11.9 yrs, 78.7±15.0 kg, 28.9±5.5 kg/m2 & MOD: n = 8, 52.6 ± 11.2 yrs, 67.2 ± 9.1 kg, 26.0 ± 4.9 kg/m2). No significant changes were observed in E/e', e', E/A, and DT in the MOD group. In the HIIT group, a significant decrease in e' was observed (Pre: 9.99 ± 2.87, Post: 8.33 ± 1.92, p=0.043, d = -1.1). A trend toward a significant decrease in E/A was observed (Pre: 1.37 ± 0.43, Post: 0.99 ± 0.33, p=0.081, d = -0.79). There were no significant between-group differences in ΔE/e', Δe', and ΔE/A. CONCLUSION: Patients in the HIIT group saw modest changes in e' and E/A during breast cancer chemotherapy, while patients in the MOD group did not. Diastolic dysfunction grade and other markers of diastolic function were not adversely affected. The clinical significance of these changes remains unknown and remains to be compared to a non-exercise control group. Funding: UVA CPH & iPRIME Seed Funding

O107: RELIABILITY OF A NOVEL MEASURE OF CEREBRAL ARTERIAL STIFFNESS: HEART-TO-MIDDLE CEREBRAL ARTERY PULSE WAVE VELOCITY

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PURPOSE: Non-invasive measures of cerebral arterial stiffness (AS) may provide useful clinical and research data releated to brain health. However, evidence supporting cerebral AS measures is largely limited to magnetic resonance imaging methods that restrict clinical use based on equipment availablity and limit research trial design. Heart-to-middle cerebral pulse wave velocity (hmPWV) is one proposed measure that assesses cerebral AS using easily available equipment, but it is supported by limited reliability data. This study aims to determine the reliability of hmPWV. **METHODS:** 9 healthy, middle-aged adults (44.2 ± 5.2 years old, 89% female) were used for this preliminary analysis. hmPWV was assessed using an impedance cardiogram and a transcranial doppler ultrasound. Participants arrived at the lab at the same time of day between 07:00-09:00, consumed a standardized meal, then laid semi-recumbent for 20 minutes prior to measurement. Visits were separated by at least 48 hours and no more than 7 days. A single technician (AP) performed all measurements. Reliability was analyzed by calculating intraclass correlation coefficients (ICCs) using Jamovi 1.6.23.0. **RESULTS:** The mean value of hmPWV in this dataset was 1.17 ± 0.6 m/s (range: 0.48-1.59 m/s). Between-day within-participant variation was Δ0.71 ± 0.51 m/s (range: Δ0.19 to Δ1.65 m/s). The largest average difference was between visit 1 and 2 (Δ0.74 m/s), followed by visit 2 and 3 (Δ0.63 m/s). Our preliminary analysis generated an ICC of 0.40 (95% CI: 0.09-0.937), indicating poor reliability for hmPWV. **CONCLUSIONS:** This preliminary analysis indicated poor reliability for hmPWV. More data is needed to support use of this measure. Also, differences between subsequent visits may indicate a need for additional measurement standardization. However, these results are likely underpowered and the trial generating this dataset is continuing. Additional analyses are also planned including agreement over a postural change (semi-recumbent to seated).

O201: FREQUENCY OF PSYCHOLOGICAL SYMPTOMS ACROSS ACTIVE AND PLACEBO PHASES IN ORAL CONTRACEPTIVE USERS

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Introduction: About 65% of women report using contraception, 14% of whom use oral contraceptive pills (OC). Oral contraceptives supply a regular dose of synthetic hormone, eliminating hormonal fluctuation of estrogen (E) and progesterone (PdG) and ovulation that occurs with the menstrual cycle. This consistently low-hormone profile may affect the presentation or frequency of psychological symptoms commonly associated with hormonal fluctuation. Therefore, the purpose of this study was to evaluate the frequency of psychological symptoms (symp) between hormonal phases in oral contraceptive users. **Methods:** Eight OC women (Age: 22.9±2.4yrs; Height: 164.9±7.1cm; Weight: 63.4±4.1kg; %BF: 23.4±2.1%) reported daily symptoms using a smartphone app (FEMM™). Psychological symp (mood swings, insomnia, social withdrawal, crying spells, anxiety, can't focus, sad, happy, irritable, and upset) were used for this analysis. Hormones were measured daily using a urine hormone monitoring device (E and PdG test strip; INITO Fertility Monitor). Absolute psychological symp frequency was evaluated by pill day and average frequency was evaluated across the early active (days 1-7), mid active (days 8-14), late active (days 15-21), and placebo (days 22-28) pill phases. **Results:** Average E (p=0.723) and PdG (p=0.175) were not significantly different between hormone phases. Across all participants, 93 total psychological symp were reported. Average symp frequency was 4.7±1.6 (3-8 symp) in early active phase, 3.3±1.1 (1-4 symp) in mid-active phase, 1.6±1.6 (0-4 symp) in late-active phase, and 3.7±1.8 (1-6 symp) in placebo phase. There were significant differences in symp frequency between phases (p=0.008). Specifically, there was a significant difference between early active and late active (MD±SE; 3.1±0.8 symp; p=0.005). **Conclusion:** Results suggest that psychological symptom frequency may vary across an OC pill cycle. Specifically, reported psychological symptoms tended to be higher when switching between active and placebo phases, but tended to decline with consistent active pill use. Future research could consider specific types and frequency of psychological symptoms that vary between active and placebo phases and explore exercise or nutritional strategies to help moderate this fluctuation in symptoms.

O202: EXERCISE, CARBOHYDRATE INTAKE, AND THE CIRCADIAN GLUCOSE CYCLE IN INDIVIDUALS WITH PREGNANCY HYPERGLYCEMIA

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Background: Treatment for pregnancy hyperglycemia includes lifestyle modification. There are numeric targets to guide the carbohydrate content of meals and minutes of moderate to vigorous intensity physical activity (MVPA), but no recommendations to guide the *timing* of these behaviors. Increased scientific understanding of the 24-hr glucose cycle, under free-living conditions and controlling for these health behaviors, could lead to the development of *timing*-based interventions for glycemic control during pregnancy.**Methods**: Data from the first four participants in the Time to Move Randomized Crossover Trial (ClinicalTrials.gov #NCT06125704) were used to explore differences in mean 2-hr postprandial glucose following breakfast (between 5-9am) compared to dinner (between 4-8pm), across 3 observation-days. Glucose values were obtained from blinded Dexcom G6 Pro Continuous Glucose Monitoring devices. Mean postprandial glucose values were adjusted for meal-specific dietary intake (i.e., grams of carbohydrate consumed) and MVPA (i.e., 30-minutes of walking or stepping, beginning within 30-40 minutes of starting the meal). Analyses were conducted with Proc Mixed in SAS 9.4.**Results**: After adjusting for meal-specific carbohydrate intake and MVPA, mean 2-hr postprandial glucose was 121.73 mg/dl (SE 16.45) for breakfast compared to 116.56 mg/dl (SE 16.12) for dinner. In the fully adjusted model, mean 2-hr postprandial glucose was 124.69 mg/dl (SE 17.61) after eating a high carbohydrate meal compared to 113.59 mg/dl (SE 15.63) after a low carbohydrate meal, and 122.81 mg/dl (SE 15.78) when MVPA was not completed after the meal compared to 115.47 mg/dl (SE 16.91) when MVPA was completed following the meal.**Conclusions**: Additional data are pending and will improve the precision of estimated differences, but following adjustment for carbohydrate intake and postprandial MVPA, glucose levels appear to be higher after breakfast compared to dinner.

O203: EXPLORING SELF-EFFICACY AND RESILIENCE FOR LEISURE TIME PHYSICAL ACTIVITY FROM PREGNANCY THROUGH 6-MONTHS POSTPARTUM

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Background: Levels of self-efficacy and resilience for performing leisure time physical activity (LTPA) are believed to facilitate one's willingness to initialize and/or maintain PA. The purpose of this study is to explore individual level changes in self-efficacy and resilience for LTPA across the pregnancy to postpartum transition in individuals with gestational glucose intolerance (GGI) or gestational diabetes (GDM). Methods: This is a secondary analysis of data collected for the Project Wellness pilot feasibility trial (N= 20). Surveys were administered at baseline (i.e., 31 weeks' gestation), and at 3-months and 6-months postpartum. Survey items used a Likert scale (from 0 to 10) to assess feelings and attitudes toward LTPA. Items were categorized as contributing to self-efficacy (6 items) if they related to internal perceptions of confidence to perform LTPA (e.g., when they are feeling depressed), or resilience (6 items) if the items assessed one's ability to overcome external barriers to performing LTPA (e.g., when there are competing interests). Mean individual level scores for self-efficacy and resilience were computed for each time point. Mean scores were compared over time with Repeated Measures ANOVA in SPSS, using the Huynh-Feldt correction. Results: Mean self-efficacy decreased over time; it was 4.85 (SE 1.92) in pregnancy, 4.29 (SE 1.99) at 3-months, and 3.89 (SE 2.29) at 6-months (P = .04). Mean resilience also decreased from pregnancy to the postpartum period; it was 4.70 (SE 1.42) in pregnancy, 3.52 (SE 1.68) at 3-months, and 3.19 (SE 1.97) at 6-months (P <.001). Conclusions: Findings suggest that self-efficacy and resilience both decrease from pregnancy to 6-months postpartum. Interventions promoting LTPA during this transition should incorporate strategies to improve self-efficacy and resilience for LTPA that are tailored to the unique challenges of this important life stage.

O204: INFLUENCE OF EXERCISE METRICS DURING PREGNANCY ON MATERNAL BLOOD BIOMARKERS

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Purpose: To assess the effects of prenatal exercise metrics on maternal blood biomarker profile. We hypothesized that any prenatal exercise type and increased volume would improve maternal blood biomarkers relative to non-exercisers.**Study Design:** Healthy pregnancy women were recruited and randomly assigned to 150 min/wk of aerobic, muscular strength, or combined (aerobic+strength) moderate-intensity exercise, or a non-exercising stretching/breathing (control) group for ~24 weeks. Exercise metrics (frequency, intensity, duration, volume, attendance) were tracked across pregnancy. At 16- and 36-weeks gestation, maternal blood draw was performed to assess blood lipid profile. The differences between 36 - 16 wks are reported as the change score. Data were analyzed using analysis-of-variance and regression. **Results:** Data from 290 participants was analyzed. Maternal descriptors were similar between groups, except prepregnancy BMI. For per-protocol analysis, resistance and combination groups have lower 36 wks insulin and HOMA-IR compared to controls. Controlling for exercise attendance, 36 wk HDL is predicted (R^2=.53, p=.0001) by 16wk HDL, maternal age, and exercise group [lower in Control]. Maternal 36 wk insulin is predicted (R^2=.90, p=.0001) by 16 wk insulin, total exercise trainings, and exercise attendance. Controlling for gravida, 36 wk HOMA-IR is predicted R^2=.91, p=.0001) by 16 wk HOMA-IR, maternal age, prepregnancy BMI, and weekly exercise frequency. Controlling for maternal race, insulin change score is predicted (R^2=.75, p=.0001) by exercise attendance, total exercise training, and 16 wk insulin. Controlling for exercise attendance, HOMA-IR change score (R^2=.92, p=.0001) is predicted by 16 wk HOMA-IR, prepregnancy BMI, maternal age, and total exercise training. Controlling for exercise, attendance, lactate change score is predicted (R^2=.42, p=.0001) by 16 wk lactate, exercise group [↓Control, ↑Aerobic], and parity.**Conclusions:** These findings suggest that an increased number of total exercise sessions across pregnancy is important in healthy maternal blood biomarkers. Additionally, resistance exercise has a positive influence on maternal blood biomarker outcomes. Overall, research should focus on exercise volume and exercise type across pregnancy for maternal health.

O205: THE EFFECT OF PRENATAL EXERCISE ON INFANT BMD

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BACKGROUND: Bone mineral density (BMD) is an area-based density measurement that is a crucial factor contributing to future fracture risk, while bone mineral content (BMC) refers to the total amount of bone mineral. The literature suggests that the intrauterine environment can play a part in modifying the skeletal potential of the offspring, and it has been proposed that BMC programming within the periosteum occurs during the prenatal and early postnatal period. It is also well-documented that stress applied to the skeletal system via exercise and physical activity can increase BMC and BMD, however, it is unknown whether these adaptations can be translated to the offspring in utero from prenatal exercise. Thus, the effects of exercise and exercise type during pregnancy on offspring BMD are unknown. The purpose of this study is to examine the effects of exercise and exercise modality during pregnancy on 1-month infant BMD. **METHODS:** Pregnant women were recruited and randomized into aerobic (AE), resistance (RE), combination (CE), or control (CON) groups. Participants completed ~150 min/week of supervised exercise until delivery. After delivery, infant BMD and BMC were assessed via DEXA at their 1-month follow-up visit. Correlations assessed the relationship between participant measurements and infant BMD. Regressions assessed predictors of 1-month BMD. **RESULTS:** Groups were similar in maternal, neonate, and 1-month descriptors. Positive trends observed for infant BMD included: maternal 16wk body fat, 16 wk HDL levels, and exercise duration >176.6min/wk. Significant predictors in determining changes of 1-month BMD included pre-pregnancy BMI, gestational diabetes mellitus (GDM), maternal 16 wk HDL and 36 wk triglyceride levels, as well as exercise mode and intensity. **L** Maternal body fat, HDL, and triglycerides levels, as well as exercise duration, have beneficial effects on 1-month infant BMD.

Further research is needed to more clearly understand the most efficient exercise prescription during pregnancy for offspring BMD.

O206: PHYSICAL ACTIVITY LEVELS IN BLACK AND WHITE WOMEN DURING EARLY PREGNANCY

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Background: Limited research exists examining physical activity levels during the early stages of pregnancy, especially in different races. Thus, the purpose of this study is to investigate the physical activity levels between Black and White women in early pregnancy. **Methods:** We recruited healthy pregnant women between 18-40 years old, ≤16 weeks' gestation. Participants wore an ActiGraph Link on their non-dominate wrist for 7 consecutive days to measure physical activity. Data were analyzed to determine minutes per day (min/d) spent in light, moderate, and vigorous-intensity physical activity. Student t-tests was used to compare physical activity levels between races. **Results:** We analyzed physical activity levels of 8 pregnant women (4 Black; 4 White). On average, participants were 28.5 ± 3.35 years, with a BMI of 30.77 ± 7.22kg/m^2 and wore the Link for 15 hours/day. Light-intensity physical activity was similar (p=0.69)between Black (628.5 ± 238.9 min/d) and White women (686.07 ± 175.7 min/d). Moderate-intensity physical was also similar (p=0.82) between Black (280.3 ± 142.6 min/d) and White women (254.53 ± 69.7 min/d). None of the women engaged in vigorous-intensity physical activity. **Conclusions:** The intensity and amount of physical activity are similar between the two racial groups in early pregnancy. During early pregnancy, both Black and White women were meeting physical activity recommendations. Future research should examine physical activity levels in Black and White women through all trimesters of pregnancy to see if they remain stable.

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O207: THE EFFECT OF PRENATAL EXERCISE ON 1-MONTH INFANT CARDIOMETABOLIC RISK

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BACKGROUND: Obesity during pregnancy leads to increased risk for complications during gestation and delivery as well as increased offspring risk of future disease. Accumulating evidence suggests the importance of the intrauterine environment on subsequent cardiometabolic profiles in the offspring. Aerobic exercise during pregnancy has been well-established as safe and effective for both mother and infant. It is unknown which mode of prenatal exercise provides the greatest benefit for offspring health, specifically decreased cardiometabolic risk (CMR). The purpose of this study is to examine the effects of exercise modes during pregnancy on 1-month infant CMR. METHODS: Pregnant women were recruited and randomized to either aerobic (AE), resistance (RE), combination (CE), or control (CON) groups. Participants completed 150 min each week of supervised exercise. After delivery, 1-month infant CMR was assessed using a standardized sum of z-scores of the following variables: low-density lipoprotein (LDL), inverse high-density lipoprotein (HDL), abdominal circumference (AC), and body mass index (BMI). ANOVAs were used to compare differences between exercise groups; data was stratified by pre-pregnancy BMI (healthy weight vs. overweight-obese) and infant sex. Regressions assessed predictors of 1-month CMR. Correlations assessed the relationship between 1-month CMR and pre-pregnancy BMI with potential confounding variables. RESULTS: Groups were similar in maternal, neonate, and 1-month descriptors. Trends for decreased CMR included: any mode of prenatal exercise (p=.08), relative to controls; in infants of healthy weight (HW) women (p=.15), but not in overweight-obese (OO) women; and in female (F) (p=.13) and male (M) (p=.23) infants. Although there is a positive correlation between 1-month infant CMR and pre-pregnancy BMI (p=0.048), this relationship is reversed with AE, as well as increased weekly intensity, weekly frequency, weekly duration, total trainings, or total intensity. CONCLUSIONS: Maternal exercise mode as well as increased weekly frequency, duration, and intensity have a beneficial influence on 1-month infant CMR. Further research is needed to more clearly understand the most efficient exercise prescription during pregnancy to decrease offspring CMR.

O301: THE RELATIONSHIP BETWEEN CRAVING, SLEEP, AND ACTIVITY: A SECONDARY ANALYSIS OF A RANDOMIZED CONTROLLED TRIAL.

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BACKGROUND: Obesity is an ongoing health issue in the United States which has been upwardly trending in recent years. Healthy eating, exercise, and moving more have been associated with lowering the risk of obesity, however individuals struggle with maintaining this lifestyle due to other psychological factors such as food cravings. Individuals feel food cravings at varying frequencies and intensities based on external factors such as exercise and sleep. The purpose of this study was to determine how the factors of sleep, exercise type, and moving more and sitting less in combination, effect craving responses in individuals. METHODS: Participants in this study included older adults ages 65-85 classified as obese (BMI of 30 to 45 kg/m^2), and inactive 6 months prior to the study. Participants all participated in a dietary weight loss program (WL) and were randomized to one of three exercise groups. These groups included an aerobic exercise program (WL+ EX), a moving more and sitting less program (WL+SL) and a group that combined exercise and sitting less (WL+SL+EX). Using an ecological momentary assessment (EMA), participants measured their state of craving at baseline and follow-up visits with a multidimensional state measure of craving. In addition, participants measured sleep scores using an EMA. Higher scores indicated higher feelings of cravings as well as better ratings of sleep. Linear mixed models were used to examine the relationship between craving scores, sleep scores, and exercise group. RESULTS: In total the study consisted of 150 participants with a mean age of 69.7 years +/- 4.09. Results of the final model show a significant three-way interaction between sleep, timepoint, and WL+SL+EX (B=-0.49, p=0.02; WL+SL as reference). Inspection of predicted values indicate that individuals who participated in the WL+SL+EX group with good sleep scores, had the steepest decrease in craving from the beginning of the study to the end. Individuals in the WL+SL group with good sleep scores had a slight increase in cravings. CONCLUSION: These results reveal that the combination of WL+SL+EX and improved sleep may reduce cravings and therefore may be a useful intervention for those attempting to manage weight.

O302: EVALUATING DIFFERENCES IN OBJECTIVE SLEEP OUTCOMES BY PHYSICAL ACTIVITY STATUS IN COLLEGE-AGED INDIVIDUALS

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BACKGROUND: Poor sleep is associated with cardiometabolic diseases, obesity, and all-cause mortality. Many college-aged individuals have suboptimal sleep durations and poor sleep quality characterized by extended latency (how long it takes to fall asleep) and low efficiency (percentage of time spent asleep while in bed). Lifestyle factors such as physical activity (PA) may influence sleep, but there is limited evidence evaluating the association between PA status and objective sleep assessments in college-aged individuals. The purpose of this study was to compare objective sleep outcomes (duration, latency, efficiency) between active and inactive college-aged (18-25 yrs old) individuals. METHODS: 22 college-aged active (n=12) and inactive (n=10) individuals (68% female, Age: 22.5±2.0 yrs, Body Mass Index: 24.2±3.0 kg/m2) participated in this study. Participants self-reporting less than 2 days a week of exercise were classified as inactive; PA was quantified by calculating moderate-to-vigorous physical activity (MVPA) per week reported by the International Physical Activity Questionnaire. Average sleep duration, latency and efficiency were measured by a 3rd generation Oura Ring for 1 week and used for analyses. Three analysis of covariance tests compared differences in each sleep outcome between the active and inactive groups while controlling for sex. RESULTS: The average MVPA was 312.1±105.5 min/wk for the active group and 33.5±48.9 min/wk for the inactive group. There were no significant differences between groups in sleep duration (active: 8.1±0.5 hrs, inactive: 8.1±0.8 hrs, p=0.895), latency (active: 14.8±3.9 mins, inactive: 16.5±6.7 mins, p=0.762), or efficiency (active: 89.3±3.4, inactive: 88.9±3.3, p=0.444). CONCLUSIONS: In this college-aged sample, sleep duration, latency, or efficiency did not differ by PA status. Future research should investigate the effects of other factors on sleep such as timing of PA participation, sex, stress, and additional lifestyle behaviors (e.g., caffeine, alcohol, cannabis use) in a larger sample. This could provide

potential targets for interventions focused on improving sleep and health in college-aged individuals. FUNDING: This project was supported by the NIH NCATS (UM1TR004406).

O303: WHEN IS SLEEP MOST IMPORTANT: EXAMING SLEEP AND PERFORMANCE IN FEMALE COLLEGIATE CROSS COUNTRY RUNNERS

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BACKGROUND: Sleep plays a paramount role in exercise recovery and may improve the tolerance of the physical demands typical of endurance training. While the distinction between the effects of sufficient and insufficient sleep on performance is known, there is a paucity of data evaluating when that sleep is most important prior to a race event. Thus, this study evaluated the relationship between sleep habits at multiple pre-race time points and performance in female collegiate cross country runners. **METHODS**: Mid-season sleep duration and race performance were assessed in 11 female collegiate cross country runners during the 2021 COVID-19-shortened season. Sleep duration was determined via use of a vetted wrist-worn hear rate and biometric monitor (WHOOP, Inc., Boston, MA). Additionally, sleep duration was evaluated at multiple pre-race time points (mid-training, 7-, 5-, 3-, and 1-day pre-race). Race performance was defined by the average time per kilometer (time/k) during race events. Repeated measures analysis of variance testing was utilized to evaluate differences in pre-race sleep, while Pearson correlations were used to assess the relationships between sleep and performance. **RESULTS**: There were 7 races (average distance: 5.8±0.4 km) during the season. Average finish time was 21.6±2.4 mins, equating to 3.7±0.2 mins/km. Average sleep duration was the same at all pre-race time points (7.40 - 7.05 hrs; p>0.05). Mid-training as well as 7- and 5-day pre-race sleep duration was significantly, negatively correlated with time/k (r = -0.71 - -0.56; all p<0.05), with 7-day pre-race sleep exhibiting the strongest relationship and accounting for 50% of the variation in time/k. This relationship was not seen with 3- and 1-day pre-race sleep. **CONCLUSIONS**: Sleep duration did not change at any point pre-race in female collegiate cross country runners. However, mid-training as well as 7- and 5-day pre-race sleep exhibited a negative relationship with race performance (i.e., those who slept more ran faster), while 3- and 1-day pre-race sleep showed no relationship. These findings suggest that sleep 5 to 7 days before a race is important for race-day performance, lending credence to the notion that sleep should be a focus throughout the training process, not just on the days immediately preceding a race.

O304: THE ROLE OF SLEEP IN WEIGHT LOSS MAINTENANCE AFTER BARIATRIC SURGERY IN ADULT FEMALES

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BACKGROUND: Bariatric surgery remains the most effective treatment for obesity, yet many individuals experience substantial weight regain following surgery. Poor sleep is a known risk factor for primary weight gain, but its role in weight loss maintenance following bariatric surgery remains largely uncharacterized. The purpose of this cross-sectional analysis is to examine the relationship between polysomnography- and actigraphy-derived sleep variables with weight regain (lowest weight following bariatric surgery to current weight; %WR) in a pilot sample of female adults who underwent bariatric surgery. **METHODS:** Eleven female adults (age, 58.7 ± 7.2 y; BMI, 36.1 ± 8.4kg/m^2; body fat, 46.3 ± 7.9%) who underwent bariatric surgery >1 year ago completed a 7-day study protocol. Actigraphy-derived sleep efficiency and duration were calculated using the Cole-Kripke algorithm. Self-reported sleep quality (Karolinska Sleep Diary) was averaged over the 7 days. On one night, sleep was captured via in-home polysomnography and analyzed for duration, efficiency, architecture (i.e., stage N2, N3, REM sleep), and sleep-disordered breathing (i.e., apnea-hypopnea index, snoring). Participants self-reported highest lifetime weight and lowest weight since surgery, and current body weight and body composition were measured in-laboratory via BodPod. %WR was calculated as current weight - lowest weight after surgery. Linear regression models assessed the relationship between actigraphy- and PSG-derived sleep variables with %WR. Covariates included total weight loss after surgery (highest lifetime weight - lowest weight post-surgery; kg) and time since surgery (months). **RESULTS:** %WR post-surgery was 12.7 ± 11.5%. While not statistically significant, large effects were noted for an inverse relationship between REM sleep duration with %WR (β = -0.18, 95%CI [-0.3, -0.1], p = 0.08; adjusted R^2 = 0.86). No other significant associations between sleep variables with %WR were noted (p > 0.05). **CONCLUSIONS:** In this pilot sample, sleep variables were not associated with %WR post-bariatric surgery. However, there is some preliminary evidence that greater amounts of REM sleep may be associated with better weight loss maintenance after bariatric surgery, given its role in mood regulation and executive function.

O305: HEIGHTENED VIGILANCE IS ASSOCIATED WITH SHORTER SLEEP AND POORER SLEEP QUALITY IN BLACK EMERGING ADULTS

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BACKGROUND: Racial discrimination and heightened vigilance are likely contributors to racial disparities in sleep. We investigated associations between self-reported racial discrimination, heightened vigilance, and perceived stress with self-reported sleep, actigraphy- (AG) and polysomnography- (PSG) assessed sleep, and whether changes in these three measures were associated with sleep outcomes over 6 months in Black adults ages 18-28 years old. METHODS: Twelve participants (10 females; age: 21.3 ± 2.5 years; body mass index: 25.2 ± 3.2 kg/m2; body fat: 25.2±10.1%) had baseline (BLN) data, and 10 participants had data at BLN and 6-month follow-up. All measurements were repeated at both timepoints and included self-reported racial discrimination (18-item Racism and Life Experiences Scale), heightened vigilance (6-item Heightened Vigilance Scale) and perceived stress (Perceived Stress Scale), 7 days of AG sleep duration and efficiency, self-reported sleep quality (Karolinska Sleep Diary) and 2 days of in-home PSG sleep (stage 2, slow-wave and REM sleep durations). Spearman correlations assessed associations between racial discrimination, heightened vigilance, and perceived stress with sleep outcomes at BLN. Changes in all outcome measures (6-month follow-up - BLN measures; Δ) were calculated and rank transformed. Partial Pearson correlations assessed associations between ranked values for Δracial discrimination, Δheightened vigilance, and Δperceived stress with ranked values for Δsleep outcomes and included BLN stress/vigilance scores as covariates. RESULTS: BLN heightened vigilance was inversely associated with total sleep duration (r = -0.62; P = 0.03). Δheightened vigilance was inversely associated with Δself-reported sleep quality (r = -0.76; P = 0.02). Non-significant, but large effects were noted for inverse associations between BLN racial discrimination with AG sleep duration (r = -0.57; P = 0.05) and perceived stress with slow-wave sleep duration (r =-0.55; P = 0.06), and between Δracial discrimination with Δslow-wave sleep duration over 6 months (r = -0.55; P =0.12). CONCLUSION: We report initial evidence of associations between heightened vigilance with shorter sleep duration and poorer self-reported sleep quality in Black emerging adults.

O306: USING WEARABLE TECHNOLOGY TO EVALUATE SLEEP AND STRESS FOR PHYSICIANS: A SYSTEMATIC REVIEW

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BACKGROUND: Physician stress and burnout are increasingly prevalent issues that are often exacerbated by chronic sleep deprivation. Poor sleep not only compromises the well-being of physicians, but also can negatively impact patient care and safety. As wearable technology has become more advanced, there is a growing potential to use these devices to monitor and analyze physiological metrics such as sleep and stress levels in real time. This systemic review aims to investigate the use of wearable technology to track sleep quality, stress, and burnout among physicians at various levels of training. **METHODS:** A systematic review was conducted according to PRISMA guidelines using Medline, Cochrane, and Embase to identify studies that utilized wearable technology to monitor sleep and stress outcomes in physicians. Inclusion criteria focused on studies that specifically measured sleep quality, stress, and burnout using wearable technology. Thirteen studies were included in this review. Data extracted from the included studies detailed study design, participant characteristics, type of wearable technology utilized, and measured sleep outcomes and heart rate variability data. **RESULTS:** The data of 540 physicians was included in this study with Emergency Medicine and Trauma Surgery representing the largest proportion of specialties assessed. Physicians not on-call slept an average of 398.3±49.0 minutes per night, those on-call slept an average of 226.0±71.3 minutes per night. Physicians also spent 82.5 ± 13.4 minutes in REM

sleep per night and 41.3 ± 21.8 minutes awake in bed before falling asleep. HRV measures showed an average Standard Deviation of the R-R Intervals (SDNN) across studies of 62.7±28.8ms. **CONCLUSION:** Wearable technology data indicates that physicians sleep less than the recommended amount per night and have reduced sleep quality measures. Heart rate variability data indicates increased levels of stress and burnout. The data provided by wearable technology may improve physician well-being and ultimately patient care.

O307: SLEEP THE NIGHT BEFORE A REPORTED FALL AMONG LOW-INCOME COMMUNITY-DWELLING OLDER WOMEN: A CASE SERIES

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Sleep is essential for maintaining cognitive function and skeletal muscle health. Chronic disturbances in sleep duration are associated with fall risk in older adults, especially those in low-income communities. This case series aimed to describe sleep the night ($Night_x$), week, and month leading to a reported fall in three African-American, low-income, community-dwelling older women (age = 72.7 ± 5.9 years; BMI = 32.5 ± 1.5 kg/m^2) from Orlando, Florida, USA. Participants wore a Fitbit® Charge 5 smart-watch on their non-dominant arm and were prospectively followed, with monthly phone calls to record reported falls. Light, deep, rapid eye movement (REM), wake after sleep onset (WASO), and total sleep duration was compared between $Night_x$ and the previous 7- and 30-day averages using a dependent t-test. Total sleep duration on $Night_x$ was 171, 435, and 495 minutes for Participants A, B, and C, respectively. $Night_x$ sleep duration for Participant B was comprised of 54% light, 14% deep, 19% REM sleep, and 13% WASO. $Night_x$ sleep duration for Participant C was comprised of 57% light, 15% deep, 20% REM sleep, and 8% WASO. $Night_x$ sleep duration for Participant A was less than 3 hours, so the Fitbit® did not record sleep stage information. For Participants B and C, light, deep, REM, WASO, and total sleep duration on $Night_x$ significantly differed compared to the 7-day ($t=5.0$-31.6, $p<0.01$) and 30-day ($t=9.7$-25.5, $p<0.01$) averages, and the differences varied in directionality. Total sleep duration for Participant A was significantly lower on $Night_x$ compared to their 7-day ($t=46.6$, $p<0.001$) and 30-day ($t=31.8$, $p<0.001$) averages. Time to sleep and wake varied for all participants in the week leading to the fall, indicating circadian dysregulation. Sleep on the night preceding a reported fall may differ from chronic sleep patterns, suggesting that a bout of atypical sleep may impact acute fall risk; however, conclusions drawn from this case serious should be done with caution given the limitations of the study design. Nonetheless, the prospective use of wearable technology with older adults may allow clinicians to monitor sleep and detect dysregulated sleep patterns to intervene.

O401: EFFECT OF TRAVEL STRESS & TRAINING ON MOOD & PHYSICAL READINESS IN NCAA DI WOMEN'S BASKETBALL ATHLETES

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BACKGROUND: Recent conference realignment in college sports has dramatically increased the travel that teams will undergo during their seasons, which could negatively affect different items of recovery and performance. Mood states may indicate maladaptation in athletes, which can lead to the development of overtraining syndrome. This study aimed to examine the impact of travel stress (TS) and external training load (ETL) on subjective wellness and physical readiness in NCAA DI Women's Basketball athletes over one competitive season. METHODS: NCAA DI Women's Basketball athletes (n=13) completed a subjective wellness questionnaire on a weekly basis. Acute (ATS) and chronic travel stress (CTS) were quantified using predetermined criteria of travel demand of the preceding week (ATS) and cumulatively over the prior month (CTS). ETL was measured by sport-specific GPS monitors worn during training and game sessions. Mood states (Happiness and Irritability) and physical readiness (Soreness and Fatigue) were reported via a smartphone-distributed questionnaire. Repeated measures linear mixed models were used to measure the effects of TS and ETL on the subjective well-being of the athletes, and an alpha level of $p < .05$ was used to determine statistical significance.
RESULTS: CTS was significantly negatively associated with subjective happiness (ß = -.014; p = .036), such that as CTS increased, subjective happiness decreased. Prior week ETL was significantly negatively associated with soreness (ß = -.0005; p = .017) and fatigue (ß = -.0004; p = .031), such that a higher ETL in the previous week worsened the athletes' subjective soreness and fatigue. CONCLUSIONS: Results from this study would indicate that CTS and ETL negatively affect items of recovery in NCAA DI Women's Basketball, suggesting future research on the topic is warranted in light of recent changes to the geographical landscape of NCAA DI athletics.

O402: EXAMINATION OF GRATEFUL OUTLOOK ON COLLEGIATE ATHLETES' MENTAL HEALTH

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BACKGROUND: As the collegiate athletic population has increased over time, so have the symptoms of depression and other mental health disparities. Accessible and effective mental health resources have not met the demands required for this population. Practicing gratitude to enhance well-being has been closely examined in recent years and linked to coping skills, satisfaction, and performance in athletic populations. The purpose of this true experimental survey-based study was to investigate whether the mean mental well-being scores would differ for those whose journaling task focused on gratitude compared to those in the control group in a sample of college athletes over two weeks. **METHODS:** A 2 (group) x 2 (time) Mixed Factorial ANOVA was used to explore the impacts of gratitude on Division II (n = 17) and III (n = 19) NCAA college athletes (N = 36). Participants were pre-randomized into a gratitude or control group for two weeks where they journaled (or not) and completed the General Health Questionnaire-12 pre- and post-intervention. **RESULTS:** Overall, there was no significant interaction between group and time. Likewise, there was no significant main effect of group or time on GHQ-12 scores. No difference in mental well-being between the groups pre- and post-intervention occurred (p = 0.60). Participants in the gratitude condition (24.1±2.9) reported less cognitive distress than those in the control group (24.6±3.2). **CONCLUSION:** Gratitude journaling did not improve mental well-being over two weeks; however, gratitude journaling may be used to preserve mental well-being in college athletes during the challenges of their sport and semester. Future researchers should focus on more extensive examinations of the utility of gratitude as an intervention tool to assist this particular population. Funding provided by Springfield College was used to compensate randomized participants across the study.

O403: STRESS RESPONSES TO SMOKE DIVER TRAINING IN CAREER STRUCTURAL FIREFIGHTERS

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BACKGROUND: Smoke diver training is a 5-day live fire simulation course designed to push firefighters to their physical and mental limits, and presents a unique opportunity to study the physiological responses to repeated live fire drills. The purpose of this study was to investigate the stress responses of firefighters during smoke diver training in the form of immunological and hormonal responses. **METHODS**: 24 firefighters (age: 31.4±6.4 yrs, ht.: 179.1±6.4 cm, wt.: 93.7±14.2 kg, bodyfat percentage (BF%): 19.0±8.0%) attending a smoke diver training course were recruited to participate in this study. Blood was drawn at 3 timepoints - morning of day 1, morning of day 4, and after training on day 4 - and analyzed for complete blood counts, blood chemistry markers, and serum cortisol concentrations. Repeated measures ANOVAs tested for temporal changes in these physiological parameters. An α-level of 0.05 was used to test for significance, and effect sizes (ES) were calculated as partial eta squared. **RESULTS**: Of the 24 firefighters who consented to participate, 16 finished, 14 of which had full blood sample series (age: 30.4±4.9 yrs, ht.: 179.6±6.2 cm, wt.: 88.1±10.8 kg, BF%: 16.2±7.5%). Serum cortisol was assayed for a subsample of eleven participants (age: 31.4±6.3 yrs, ht.: 178.6±4.0 cm, wt.: 85.3±8.0 kg, BF%: 14.8±6.4%). Between the first and final time points, there were significant decreases in erythrocytes (p<0.001, ES=0.623), platelets (p=0.002, ES=0.384), and serum cortisol concentrations but significant increases in leukocytes (p<0.001, ES=0.720) and creatine kinase levels (p<0.001, ES=0.574). **CONCLUSIONS**: The results of this study indicate that firefighters undergoing smoke diver training experience strong physiological stress as noted by high levels of creatine kinase, and corresponding strong physiological response as found through the hormonal and immune changes. Further, these results could help

delineate the acute immune and hormonal response to repeated fire emergency exposure through evaluation of physiological responses that occur either as part of regular fire training and/or in areas where there is higher risk of frequent live-fire emergencies.

O404: EFFECT OF 5 VS. 15-MINUTE MEDITATION ON HEART RATE VARIABILITY AND ANXIETY IN MALES

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BACKGROUND: Meditation is widely recommended for stress management, but time constraints are often cited as a barrier to regular practice. Many mobile applications offer short meditation sessions (<15 minutes) to address this issue. Given that time is a limiting factor for many, short-duration meditation may be a practical recommendation if it proves effective in reducing stress. Previous research suggests meditation can improve heart rate variability (HRV), a marker of autonomic nervous system regulation and a physiological indicator of stress. This study aimed to compare the effects of two durations of guided visualization meditation (5-minutes vs. 15-minutes) on HRV and subjective measures of anxiety. METHODS: Nine healthy male participants (age = 20 ± 1 years, height = 180 ± 6 cm, %BF = 16 ± 9) were recruited for a randomized, counterbalanced, crossover investigation. Participants completed one experimental trial with a 5-minute meditation and a separate trial with a 15-minute meditation. HRV was measured for 15-minutes before and 30-minutes after each meditation. Subjective anxiety was assessed using the six-item Spielberger State-Trait Anxiety Inventory (STAI) before and after each meditation session. A repeated measures ANOVA evaluated differences in HRV responses and STAI variables between meditation durations. RESULTS: HRV metrics were not significantly affected by meditation duration (lnRMSSD: p = 0.512; lnHF: p = 0.379; lnLF: p = 0.697), nor by the meditation itself (lnRMSSD: p = 0.327; lnHF: p = 0.388; lnLF: p = 0.115). However, participants reported feeling calmer (p = 0.028), less tense (p = 0.035), and more relaxed (p = 0.023) post-meditation, as measured by the STAI. No significant differences were found between the 5-minute and 15-minute meditations in any STAI measure (p > 0.05). CONCLUSIONS: Meditation, regardless of duration, did not significantly influence HRV in healthy males. However, both 5-minute and 15-minute meditations effectively increased feelings of calmness, relaxation, and reduced tension. These findings suggest short-duration meditation is a practical and effective tool for stress management, even without measurable changes in physiological stress markers like HRV.

O405: THE RELATIONSHIPS BETWEEN BODY COMPOSITION, PHYSICAL ACTIVITY, AND PSYCHOLOGICAL STRESS IN COLLEGE FEMALES

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BACKGROUND: Although physical activity (PA) is associated with improved psychological well-being, tools used to assess one's perceived stress have equivocal relationships with PA and body composition in college-aged females. This study investigated the relationship between PA, body composition, and psychological stress. **METHODS:** 13 females (aged 18-23 y) completed a protocol during which self-reported physical activity, perceived stress, and anthropometrics were recorded. Anthropometrics included height, body mass, and body composition [via bioelectrical impedance (BF%)]. PA was assessed via the International Physical Activity Questionnaire Short Form (IPAQ-SF). Perceived stress was assessed with Chronic Stress Exposure (CSE), Weekly Stress Inventory - Short Form (WSI), Perceived Stress Scale 14 (PSS-14), and Perceived Stress Scale 10 (PSS-10). The WSI produces an event score (WSIE) and impact score (WSII); both were used in this analysis. Pearson's correlations were used to explore the relationships between PA, anthropometrics, and stress scores. **RESULTS:** IPAQ scores (5946 ± 3883 MET▪mins▪week^{-1}) were weakly but negatively correlated with all stress scores (CSE; 4 ± 1 au, r = -0.14, WSII; 40 ± 23 au, r = -0.05, PSS-14; 29 ± 7 au, r = -0.03, PSS-10; 19 ± 6 au, r = -0.07), except the WSIE (14 ± 5 au, r = 0.23). BF% (31.6 ± 9.3%) was positively correlated with all stress scores (CSE; r = 0.24, WSIE; r = 0.44, WSII; r = 0.36, PSS-14; r = 0.06, PSS-10; r = 0.13). **CONCLUSIONS:** Higher levels of PA were weakly associated with lower stress scores, regardless of the tool. Alternatively, body composition was low-to-moderately associated with higher stress scores. Measurement issues related to self-reported PA may impair researchers' ability to investigate relationships with other outcomes of interest related to psychological stress.

O406: ASSOCIATION BETWEEN SLEEP REACTIVITY WITH SLEEP, CARDIOVASCULAR, AND MENTAL HEALTH IN ADULTS WITH INSOMNIA SYMPTOMS

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BACKGROUND: High levels of sleep reactivity (SR) —the sensitivity of sleep patterns to stress— has been associated with a risk of developing insomnia disorder. Furthermore, insomnia disorder raises vulnerability to other negative health outcomes. The purpose of this study was to examine the association between SR and sleep, cardiovascular outcomes, and mental health (MH) in adults with insomnia symptoms. METHODS: Data were collected on 33 insufficiently active adults (age=34.9±10.6 y, body mass index [BMI]=28.7±7.2 kg·m−2, female=84.8%, White=78.8%) with self-reported insomnia symptoms (Insomnia Severity Index=15.9±3.9). SR was assessed using the Ford Insomnia Reactivity to Stress Test (FIRST) questionnaire. Sleep was tracked using 7 nights of actigraphy and a sleep diary, variables included sleep efficiency (SE), total sleep time (TST), and wake after sleep onset (WASO). Cardiovascular outcomes included daytime resting heart rate variability (HRV), systolic and diastolic blood pressure, body fat percentage, and 1 night of nocturnal HRV. MH assessments measured anxiety (General Anxiety Disorder-7 [GAD-7] questionnaire) and depression (Patient Health Questionnaire [PHQ-9]) symptoms. Linear regression models were adjusted for race, age, sex, and BMI. RESULTS: Participants had a mean FIRST score of 24.2±5.8, indicating that 90.9% of participants have a high risk for developing insomnia disorder (FIRST ≥18). SR was not significantly associated with actigraphy- or diary-assessed SE, TST, or WASO (each p>0.174). SR was also not significantly associated with daytime cardiovascular outcomes or nocturnal HRV (each p>0.116). Higher SR was significantly associated with greater anxiety (β=0.40, p=0.045) and depression (β=0.39, p=0.05) symptoms. CONCLUSION: These cross-sectional data suggest SR was associated with psychological symptoms but not sleep or cardiovascular outcomes. Future studies should investigate early physical activity interventions to improve MH outcomes and decrease the risk of insomnia disorder.

O407: EXERCISE TRAINING AND ANXIETY SYMPTOMS: A SYSTEMATIC REVIEW AND META-ANALYSIS AMONG CHILDREN AND ADOLESCENTS

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BACKGROUND: Anxiety disorders are among the most diagnosed psychiatric disorders in the United States and affect ~ 10% of children and adolescents each year. Although preliminary evidence in adults suggests that exercise may be a promising therapeutic approach for lowering anxiety among children and adolescents, sufficient meta-analytic evidence is lacking. This study aimed to address a critical knowledge gap by conducting a meta-analysis to examine the independent effect of exercise training on anxiety levels in children and adolescents with and without clinical anxiety disorders. **METHODS**: Included studies were: 1) peer-reviewed publications, 2) published in English, 3) included youth participants <20 years of age, 4) measured anxiety levels, 5) measured the change in symptoms in a no-treatment control and exercise-only treatment group, or a combined treatment group from which the independent effect of exercise could be estimated, and 6) reported results as mean and standard deviation, standard error, or 95% confidence intervals (CI) from which an effect size could be calculated. A standardized mean difference effect size (ES) was calculated by subtracting the mean baseline or pretest anxiety value from the follow-up or posttest value at each subsequent time point and dividing the difference by the pooled standard deviation (SD) of the baseline values. Random effects models were used to aggregate a mean ES and 95% confidence interval using a 3-level meta-analysis model structure. **RESULTS**: The cumulative results from 39 effects gathered from 22 studies indicated that exercise training reduces anxiety symptoms in children and adolescents (ES=-0.71, 95% CI: -1.06 to -0.36; p<0.001). **CONCLUSION**: Given the moderate average effect size reduction in anxiety following exercise training, the results suggest that exercise

training programs may be a promising therapeutic approach for lowering anxiety symptoms among children and adolescents.

O501: HYDRATION STATUS WITH ENERGY DRINKS VERSUS WATER: DOES SEX OR HABITUAL CAFFEINE INTAKE MATTER?

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BACKGROUND: The Beverage Hydration Index (BHI) allows comparison of fluid retention profiles of different beverages relative to water. Whether caffeine impairs hydration status over a 4 h post-ingestion period has mixed findings. Our purpose was to examine effects of a caffeinated energy drink (CAF) compared to water on diuresis and whether participants' habitual caffeine intake or sex are modifying factors. METHODS: Twenty-nine healthy young adults (15 female, 14 male) participated in a BHI protocol. Beverages were administered in four 250 mL aliquots over 30 min: 500 ml of a non-carbohydrate, electrolyte-free energy drink (CAF, 280 mg caffeine) along with 500 ml water (as the first and last aliquot). Urine output was recorded over the subsequent 4 h. Habitual caffeine intake of participants ranged from 0 mg/day to 535 mg/day. Caffeine intake groups were stratified by naïve (< 25 mg/day, n = 10) and habitual users (> 25 mg/day, n = 19). RESULTS: Caffeine dose relative to body mass (BM) was higher ($p < 0.001$) for women (4.8 ± 0.7 mg/kg BM) compared to men (3.7 ± 0.4 mg/kg BM). At 4 h, BHI for CAF (0.86 ± 0.16) was lower ($p < 0.001$) versus water (1.0 ± 0). Urine mass with CAF was significantly greater ($p = 0.001$) by 223 g versus water. For BHI, there was both a sex difference and drink x sex interaction ($p = 0.021$). Males had a lower ($p = 0.021$) BHI compared to females with significantly lower BHI for CAF (0.80 ± 0.2) vs water ($p < 0.001$), but BHI (0.93 ± 0.1) in females was not lower ($p = 0.068$) than water (or the BHI standard of 1.0). CAF elicited a greater diuresis relative to water in males (by 346 g, $p < 0.001$) but not in females (by 117 g, $p = 0.074$). Habitual intake status had no effect on BHI ($p = 0.76$) for CAF between naïve (0.88 ± 0.2) and habitual user groups (0.86 ± 0.2). Urine mass on CAF was higher than water by 209 g ($p = 0.02$) and 237 g ($p < 0.001$) for naïve and habitual intake users, respectively. Urine output was not correlated ($r = .15$; $p = 0.43$) to habitual caffeine intake of participants. CONCLUSIONS: A non-carbohydrate, electrolyte-free energy drink elicited significantly lower hydration properties (by ~14%) compared to water alone. Although habitual caffeine intake of participants had no influence on diuresis, women had greater fluid retention of a caffeinated energy drink compared to men. Funded by a grant from Unilever Corporation, Englewood Cliffs, CA

O502: HYDRATION STATUS IN FIREFIGHTER RECRUITS IMPROVES OVER 13 WEEKS WITH DAILY SALIVA OSMOLARITY FEEDBACK

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BACKGROUND: Dehydration is a significant issue for firefighters, as reports show that over 90% of firefighters are continually dehydrated. Common factors that lead to dehydration in this population include occupational-related intense physical exertion, hot working environments, and wearing heavy, unbreathable personal protective equipment for long periods. Due to the individual variability in fluid losses, general hydration recommendations may not be sufficient for firefighters to maintain optimal hydration. Thus, this study aimed to determine if tracking hydration status via saliva osmolarity at the beginning and the end of each work shift for 13 weeks would promote optimal hydration behaviors over time in firefighter recruits. METHODS: Twenty-four firefighter recruits (22 male, 2 female) had hydration status measured via real-time saliva osmolarity testing at the beginning and end of each shift during Fire School for 13 weeks. Average weekly osmolarity scores were analyzed in the morning (AM) and evening (PM). Separate linear mixed-effects models were used to account for missing data scores. Individual participants were specified as a correlated random effect. Averages for each week were computed and designated as the repeated measures fixed factor Week, with 13 points (baseline and weeks 2-13). Bonferroni-adjusted post hoc tests are used when appropriate to identify significant differences between weeks. RESULTS: There was a significant effect of Week on AM [$F(12, 204.6) = 3.5$, $p < 0.001$], which was lower in week 12 than in week 4 ($\Delta = -19.12$, $p = 0.016$) and week 6 ($\Delta = -18.53$, $p = 0.026$), and which was lower in week 13 than in week 2 ($\Delta = -18.10$, $p = 0.035$), week 4 ($\Delta = -19.77$, $p = 0.010$), week 6 ($\Delta = -19.11$, $p = 0.017$), and week 7 ($\Delta = -17.95$, $p = 0.039$). There was a significant effect of Week on PM [$F(12, 153.2) = 5.2$, $p < 0.001$], which was lower in week 12 than in week 3 ($\Delta = -18.23$, $p = 0.019$) and week 7 ($\Delta = -19.88$, $p = 0.005$), and which was lower in week 13 than in week 1 ($\Delta = -18.04$, $p = 0.022$), week 3 ($\Delta = -19.79$, $p = 0.006$), and week 7 ($\Delta = -21.44$, $p = 0.001$). CONCLUSIONS: Hydration assessed by saliva osmolarity improved (decreased) over time in the recruits. This suggests that continual personal hydration status feedback may promote the specific and individualized behavioral changes needed to optimize hydration in this population.

O503: EFFECTS OF JOCKO GO ON MEASURES OF COGNITIVE FUNCTION

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BACKGROUND: Energy drinks, like JOCKO GO, contain a variety of supplements such as caffeine, vitamins, minerals, and nootropics, which may individually increase cognitive performance. However, the effects of these ingredients in combination are unknown. The purpose of this study was to investigate the acute effects of JOCKO GO on measures of cognitive function. **METHODS:** Four resistance-trained individuals (men=1, women=3, age=20±0 years) were given JOCKO GO or a placebo on two separate occasions in a counterbalanced manner. At 30 minutes post-consumption, cognitive function was assessed and included: visual reaction test, auditory reaction test, Stroop test, and digit span test. Significant differences between cognitive measures following JOCKO GO and placebo were determined using Wilcoxon Signed Rank Tests. Significance was accepted at a priori $p<0.05$. **RESULTS:** There were no significant differences ($p>0.05$) between placebo and JOCKO GO for the visual reaction test (placebo=289.0±9.9 ms, JOCKO GO=286.8±9.3 ms, p=0.72), auditory reaction test (placebo=221.0±22 ms, JOCKO GO=250.0±34.7 ms, p=0.47), Stroop test (placebo=125.5±64.2 ms, JOCKO GO=160.5±32 ms, p=0.47), or the digit span test (placebo=6±2 sequences, JOCKO GO=6±1 sequences, p=0.18). **CONCLUSIONS:** Initial findings suggest no significant cognitive performance differences for taking JOCKO GO compared to the placebo. However, a larger sample size is needed to elucidate the effects of JOCKO GO on cognitive performance.

O504: BLOOD PLASMA HYDRATION BIOMARKERS OF FIREFIGHTERS FOLLOWING LIVE-FIRE TRAINING

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BACKGROUND: Firefighters often perform physically demanding tasks while wearing turnout gear that is insulated to protect them from the external environment. Though protective, such clothing can impair sweat evaporation from the skin, preventing heat dissipation. Additionally, elevated sweat rates can alter plasma electrolyte concentrations, leading to further impairments in fluid homeostasis and thermoregulation during occupational tasks. Therefore, we investigated the effects of live-fire training (LFT) on plasma osmolality and electrolyte concentrations in firefighters. **METHODS:** 14 firefighters (25.4 ± 8.7 yrs; 177.1 ± 8.6 cm; 82.9 ± 15.1 kg) completed LFT involving 1 hour of fire suppression and search-and-rescue rotations with a 15-minute break halfway through. Firefighters rotated through these tasks multiple times. Urine specific gravity (USG) was used to assess hydration levels. Pre- and post-LFT blood osmolality and electrolyte concentrations (sodium [Na^+], potassium [K^+], chloride [Cl^-]) were collected and tested. T-tests were used to compare changes in plasma osmolality and electrolyte concentrations. **RESULTS:** Participants arrived euhydrated (1.020 ± 0.006 USG). Plasma osmolality (Pre: 284.4 ± 8.8 vs Post: 276.9 ± 5.4 mmol/L; $p = 0.03$) and plasma K^+ (Pre: 4.3 ± 0.2 vs Post: 4.7 ± 0.2 mmol/L; $p < 0.01$) were significantly different after LFT. Plasma Na^+ (Pre: 134.5 ± 1.21 vs Post: 133.3 ± 1.3 mmol/L; $p = 0.06$) and Plasma Cl^- was not significantly different after LFT (Pre: 100.8 ± 1.8 vs Post: 100.9 ± 1.5 mmol/L; $p = 0.95$). **CONCLUSIONS:** Live-fire training led to a significant decrease in plasma osmolality, a significant increase in potassium concentrations, and no significant changes in plasma sodium or chloride. Future research should include further investigations of occupationally relevant protocols by comparing urine and blood osmolality, electrolyte concentrations, and other solutes for more precise understandings of fluid regulation during live-fire training.

O505: INFLUENCE OF DAILY STEP COUNT ON FLUID INTAKE AND HYDRATION BIOMARKERS IN UNDERHYDRATED COLLEGE STUDENTS

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BACKGROUND: While many college students meet physical activity guidelines, they commonly do not meet fluid intake recommendations. This study aimed to further investigate the relationship between physical activity, total fluid intake, and hydration biomarkers, specifically in underhydrated college students. METHODS: Prospective participants completed an electronic pre-screening fluid intake questionnaire (BEVQ-15) to verify they were consuming less than current fluid intake recommendations for males (< 2.5L per day) and females (< 2.0L per day). Twelve participants (7 female) (mean ± SD; age, 23.4 ± 2.6 y; height, 168.8 ± 10.7 cm; weight, 69.4 ± 14.7 kg; body fat, 27.5 ± 9.3 %) collected 24h urine samples for 3 consecutive days to assess mean urine volume (UVOL), urinary osmolality (UOSMO), and urinary specific gravity (USG). Daily step counts were monitored with the GARMIN VENU SQ. Daily total fluid intake (TFI) was recorded using the Liq.In7 survey. Repeated-measures correlations were conducted to assess the influence of daily step counts on total fluid intake, 24h UOSMO, 24h UVOL, and 24h USG. RESULTS: Urinary hydration biomarkers among participants suggested underhydration (mean ± SD; TFI, 2183.7 ± 1405.3 mL; 24h UOSMO, 714.6 ± 219.9 mOsm*kg-1; 24h USG, 1.019 ± 0.006, 24h UVOL, 0.945 ± 0.528 kg; daily step count, 7724 ± 3975 steps). Greater daily step count was moderately associated with greater TFI ($r(20) = 0.48$, 95% CI [0.07, 0.75], $p = .025$) and greater 24h UVOL ($r(20) = 0.45$, 95% CI [0.03, 0.73], $p = .036$). There were no significant correlations between daily step count and 24h UOSMO ($r(21) = 0.13$, 95% CI [-0.30, 0.51], $p = .569$) or 24h USG ($r(22) = -0.01$, 95% CI [-0.41, 0.39], $p = .956$). CONCLUSIONS: On days with higher step counts, underhydrated college students increased their fluid intake, although not enough to improve all hydration biomarkers. Physical activity should still be encouraged without concern that this could worsen hydration status. Further investigations should determine what behavioral intervention strategies in this population may successfully promote sufficient additional fluid intake to improve hydration biomarkers. Grant or funding information: This study was supported by an internal grant from the Wellstar College of Health and Human Services at Kennesaw State University.

O506: THE EFFECTS OF BEETROOT JUICE ON GLYCEMIC AND BLOOD PRESSURE RESPONSES IN TYPE 2 DIABETICS

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BACKGROUND: Sedentary behavior and poor dietary choices contribute to the rise in cardiometabolic diseases in the United States. It is critical to identify strategies that mitigate the negative impact of these behaviors. Animal models and human studies have shown that the consumption of dietary inorganic nitrate (diNO3) may improve cardiovascular health and glucose regulation. However, the improvements in glucose regulation have yet to be corroborated in humans with type 2 diabetes (T2D). Thus, the purpose of this study was to assess the acute effects of diNO3 containing beetroot juice (BRJ) on glycemic and hemodynamic responses in individuals with T2D while controlling for medication. METHODS: Seven participants with a clinical diagnosis of T2D were recruited into this study and were temporarily removed from blood pressure- and glucose-lowering medications. Hemodynamic measurements (pulsewave velocity) and an oral glucose tolerance test (glycemic response) were measured following consumption of either BRJ or a denitrolized placebo. Saliva and blood samples were collected at baseline and post supplementation to measure changes in nitrate and nitrite concentrations. RESULTS: Significant improvements were detected in total plasma glucose response ($p = 0.022$) and the systemic vascular resistance (SVR) change score ($p = 0.009$) in the BRJ condition. CONCLUSIONS: This study demonstrated that BRJ consumption can improve oral glucose tolerance in individuals with T2D while controlling for medication; however, future larger-cohort randomized controlled trials are needed to confirm if BRJ is a viable treatment for glucose control in individuals with T2D.
This research was funded by a UAB School of Education Pilot Grant

O507: EFFECTS OF A PRE-SLEEP HYDRATION BEVERAGE ON SUBSEQUENT MORNING HYDRATION

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Previous studies have found that sodium beverages can be used to increase water retention which, therefore, improves hydration. The purpose of this study was to determine the effect of a nighttime high sodium beverage on sleep quantity and quality and next morning hydration status in a healthy population. Using a randomized, double-blind study design, college-aged females (n = 12; age = 22 ± 1) completed two counterbalanced trials. In each trial, participants were provided with either a high sodium beverage (LMNT) or a placebo (Mio). Participants consumed 8 mL/kg of body weight of these beverages 120 minutes before sleep. Participants were limited to 1.0 L of fluid for 24 hours before each trial to induce dehydration. A thirst and gastrointestinal questionnaire was completed by the participants prior to sleep and upon wakening. Participants also completed a sleep questionnaire upon wakening. Next morning hydration was assessed through urine color (Ucol) and urine specific gravity (USG) which are commonly used to determine hydration status. Thirst and gastrointestinal symptoms were not different between trials ($p > 0.05$). Sleep measures were also not different between trials ($p > 0.05$). Ucol in the combined overnight and first morning urination jug was significantly higher in the LMNT group (5 ± 1 vs 4 ± 2, $p = 0.008$). USG in the combined overnight and first morning urination jug was also significantly higher in the LMNT group (1.022 ± 0.006 vs 1.016 ± 0.007, $p = 0.035$). Urine mass was lower in the LMNT group with a p-value approaching statistical significance (277 ± 129 vs 353 ± 181, $p = 0.093$) with a medium effect size (0.532). These data indicate that consuming a high sodium beverage prior to sleep may promote fluid absorption. Additionally, caution should be taken when using urine measures following the ingestion of a high sodium beverage to determine hydration status.

Thematic Poster Presentations

TP101: INVESTIGATING THE ACCURACY OF GARMIN PPG SENSORS ON DIFFERING SKIN TYPES

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Researchers have previously investigated whether the accuracy of photoplethysmography (PPG)-measured heart rate varies based on skin pigmentation, focusing on accuracy of such devices among users with darker skin tones. It is imperative that studies exploring the impact of pigmentation on PPG accuracy are replicated. This study aimed to contrast heart rate readings collected via PPG using the Garmin Forerunner 45 in comparison with electrocardiogram (ECG) during various levels of physical activity across participants representing a range of skin tones. Heart rate data were collected from adult participants (18-64 years of age) at a single study session using the Garmin Forerunner 45 PPG-equipped smartwatch and the Polar H10 ECG chest strap. Skin tone was self-reported via the Fitzpatrick scale. Each participant completed two 10-minute bouts of moderate intensity walking or jogging separated by a 10-minute bout of light walking. A series of mixed ANOVAs indicated no significant interaction between Fitzpatrick score and phase of the activity bout (i.e., rest at start, first intensity ramp-up phase, first steady-state phase, active rest, second ramp-up phase, second steady-state phase). Likewise, there was no significant main effect for Fitzpatrick score, though there was a significant main effect for phase, which was driven by greater ECG-recorded heart rate relative to PPG during the first ramp-up phase. Our findings support prior research demonstrating no significant impact of skin tone on PPG-measured heart rate, with significant differences between PPG- and ECG-measured heart rate emerging during dynamic changes in activity intensity.

TP102: AGREEMENT OF STEP COUNTS AS MEASURED BY ACTIGRAPH, ACTIVPAL, AND COMMERCIAL ACCELEROMETERS WORN CONCURRENTLY

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The 2018 Physical Activity Guidelines Advisory Committee found insufficient evidence to establish step-based recommendations for physical activity (PA). The committee specifically called for more research comparing step counts across different devices, including research-grade accelerometers and consumer wearables (CW). **PURPOSE:** This study aimed to compare daily step counts from two research-grade accelerometers [The ActiGraph (AG) and ActivPAL (AP)] with those measured by CW in a sample of adults. **METHODS:** A total of 23 participants [15 women, 8 men, aged 18 - 62 years (30 ± 15 years, BMI = 24 ± 4), percent body fat = 25 ± 9] wore the AG, AP, and their personal CW concurrently for 4 - 7 days. The AG was positioned on the right hip, the AP on the right thigh, and the CW on the non-dominant wrist. A sleep log was maintained to record in-bed and out-of-bed times. Paired sample t-tests, Bland-Altman analyses, mean differences, and mean absolute percentage error (MAPE) values were computed. Comparisons were made only for days with matched data across devices. CW devices included were the Apple Watch (n = 11), Fitbit (n = 4), Garmin (n = 5), and other (n = 3). **RESULTS:** Step counts were lower with AG (9820 ± 3745) compared to AP (10701 ± 3535, P = 0.006), with a mean difference of 882 and MAPE of 11.4%. Bland-Altman between the AG and AP was significant (P = 0.006). AG also recorded lower steps (10089 ± 3793) than CW (11013 ± 3233, P = 0.01), with a mean difference of 924 and MAPE of 16.3%. Bland-Altman between AG and CW was not significant (P = 0.76). There was no significant difference between AP (10307 ± 3670) and CW (10723 ± 3642, P = 0.09), with a mean difference of 416 and MAPE of 9.9%. Bland-Altman between AP and CW was not significant (P = 0.37). **CONCLUSION:** The AP and CW devices demonstrated the strongest agreement in daily step counts, with no significant mean difference and a MAPE <10%. The AG consistently reported lower step counts compared to both the AP and the CW. Due to a small sample size, analysis did not allow for comparing the AG and AP to specific CW devices. Further research with larger cohorts is required to expand this analysis.

TP103: ACCELEROMETRY HARMONIZATION ACROSS RESEARCH-GRADE AND CONSUMER WEARABLE DEVICES: A COMPARISON OF MIMS, ENMO AND MAD

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BACKGROUND: Accelerometry metrics, including Euclidean Norm Minus One (ENMO), Mean Amplitude Deviation (MAD), and Monitor-Independent Movement Summary (MIMS) units, are meant to harmonize data across devices with different sampling rates and dynamic ranges. Current evidence exploring the potential of these metrics to be device-agnostic has focused on ENMO and MAD and has relied on shaker table studies. The objective of this study was to identify which metric (ENMO, MAD, MIMS) best harmonizes data across devices with varying sampling rates and dynamic ranges in children. **METHODS:** Children (n=239; 9.3 ± 2.1 years, 47% female, 30% Black) wore Actigraph GT9X (+/- 8 g, 50 Hz) research-grade accelerometers and were randomized to wear two of three consumer wearables including Apple Watch Series 7 (+/- 16 g, 50 Hz), Garmin Vivoactive 4S (+/- 8 g, 25 Hz), and Fitbit Sense (+/- 4 g, 50 Hz) on their non-dominant wrist, while participating in 60 minutes of simulated free-living activities (i.e., walking, running, soccer). The standard deviation (SD) across z-scores for ENMO, MAD and MIMS of each device was calculated at the second level as an estimate of variability across devices. Lin's Concordance Correlation Coefficient (CCC) was calculated for each combination of devices by metric to determine agreement. **RESULTS:** The SD of z-score across devices was the lowest, indicating better harmonization, for MAD (0.12 ± .23), followed by ENMO (0.24 ± .50), and then MIMS (0.26 ± .39). Lin's CCC was strongest across all combinations of devices for MAD, with coefficients ranging from 0.89 for Apple and Fitbit to 0.96 for Apple and Actigraph. Lin's CCC for MIMS ranged from 0.70 for Apple and Fitbit to 0.83 for Apple and Actigraph, and was lowest for ENMO, ranging from 0.62 for Garmin and Actigraph to 0.76 for Apple and Actigraph. **CONCLUSIONS:** MAD appears to perform best at harmonizing across research-grade and consumer devices with different sampling rates and dynamic ranges in children.

TP104: AGREEMENT BETWEEN A WRISTBAND WEARABLE DEVICE AND ELECTROCARDIOGRAPHY FOR ULTRA-SHORT HEART RATE VARIABILITY ASSESSMENT

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BACKGROUND: Wristbands enable remote assessment of resting heart rate (RHR) and HR variability (HRV), which enable cardiac-autonomic status monitoring in patients, athletes, and research participants. The Kairos device (Biostrap USA LLC, Los Angeles, California) offers manual sampling for rapid assessment and feedback, but validation studies are lacking. Thus, we aimed to evaluate the agreement between the Kairos wristband and electrocardiography (ECG) for determining ultra-short RHR and HRV. METHODS: Data from 32 young adults (34% male, 21.7 ± 3.2 years, 169.5 ± 10.3 cm, 76.0 ± 14.9 kg)met inclusion criteria for analysis (0 ectopic beats on ECG). Simultaneous 2-min ECG (1000 Hz) and Kairos samples were obtained in the supine and then seated position, each preceded by 1 min for stabilization. Kairos-derived RHR and root-mean square of successive differences (RMSSD) were automatically computed via the accompanying mobile application and retrieved from a downloadable report. ECG-derived values were computed via specialized software. Comparison statistics included paired t-tests and Bland-Altman analyses. Relative and absolute agreement were assessed with Lin's concordance correlation coefficient (CCC) and the coefficient of variation (CV), respectively. RESULTS: Supine and seated RHR for ECG (71.1 ± 9.7 and 75.8 ± 9.7 beats·min^{-1}, respectively) and Kairos (71.1 ± 9.5 and 75.9 ± 9.7 beats·min^{-1}, respectively) demonstrated minimal mean biases (0.0 ± 0.7 and 0.1 ± 0.6 beats·min^{-1}, respectively, Ps ≥ 0.53), tight 95% limits of agreement (-1.3 - 1.3 and -1.1 - 1.2 beats·min^{-1}, respectively), and strong relative (CCC ≥ 0.99) and absolute agreement (CV ≤ 0.7%). Comparatively, supine and seated RMSSD for ECG (56.3 ± 28.2 and 45.1 ± 29.7 ms, respectively) and Kairos (53.3 ± 22.3 and 46.3 ± 24.6 ms, respectively) demonstrated greater mean biases (-2.9 ± 7.7 and 1.2 ± 7.8 ms, respectively, P = 0.04 and 0.41, respectively), wider 95% limits of agreement (-18.1 - 12.3 and -14.2 - 16.6 ms, respectively), and weaker relative (CCC ≥ 0.95) and absolute agreement (CV ≤ 13.6%). CONCLUSIONS: The Kairos wristband provided valid assessment of RHR during 2-min sampling. The error displayed for HRV can be used to improve RMSSD assessment in future software updates.

TP105: EXPLORING THE USE OF WRIST-WORN WEARABLES FOR ASSESSING CARDIOVASCULAR AND FUNCTIONAL OUTCOMES

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Introduction: Wearable technology provides consumers with valuable health, physical activity, and fitness information. Several new wrist-worn devices estimate VO_2 max and count repetitions, making them useful for evaluating cardiovascular and functional fitness in remote settings; however, their validity has not been fully tested. Therefore, the purpose of this study was to determine the validity of: 1) three wrist-worn devices (Polar Ignite 3, Garmin VivoActive 5, Garmin VivoSmart 5) for estimating VO_2 max; 2) the Garmin devices for counting repetitions for sit-to-stand and arm curl tests. **Methods**: Six participants (23±2 years) were recruited for this pilot study. VO_2 max was estimated using the Polar Ignite 3, Garmin VivoActive 5, and Garmin VivoSmart 5 testing protocols and algorithms. The COSMED Quark CPET metabolic cart was used to measure VO_2 max. Participants completed the 30-second sit-to-stand and 30-second arm curl while wearing the Garmin devices. Paired t-tests were used to compare measured VO_2 max and repetitions to device-generated estimates. Significance was accepted at $p<.05$. **Results:** Measured VO_2 max (37.3±7.1 mL/kg/min) was significantly lower than the Polar Ignite 3 (50.8±9.9 mL/kg/min; p=.013) and the VivoSmart estimates (43.7±2.4 mL/kg/min; p=.033). There was no difference between measured VO_2 max and the VivoActive estimate (43.0±2.4 mL/kg/min; p=.079). Measured repetitions (11+1 repetitions) for sit-to-stand were significantly lower than estimates from the VivoActive (17±6 repetitions; p=.003) and VivoSmart (16±4 repetitions; p=.004). Arm curl estimates did not differ from measured repetitions. **Conclusion:** The Garmin VivoActive 5 better estimated VO_2 max compared to the Polar Ignite 3 and the VivoSmart 5. Garmin devices overestimated sit-to-stand repetitions, but accurately assessed the arm curl, suggesting they may be valid for evaluating upper body function. A larger sample size in the future is needed to confirm these preliminary results.

TP106: "THE MORE YOU GIVE THE WEARABLE, THE MORE IT GIVES YOU": REGULAR EXERCISERS EXPERIENCES WITH WEARABLE SCORES

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BACKGROUND: The use of consumer off-the-shelf wearables (COTSW) for exercise and self-monitoring has grown significantly. These devices offer health insights, including individual 'recovery' or 'readiness' scores derived from heart rate variability (HRV), designed to optimize training. Limited research exists on the psycho-behavioral aspects of HRV-derived scores, which can affect user adoption. Thus, this study aimed to explore individuals' experiences with wearable devices and readiness/recovery scores. **METHODS:** Seventeen regular exercisers (65% F, 33 ± 5y, Race= 82% White, 2±1 years with wearable) self-reported owning and utilizing a Whoop™ band or Oura™ ring for at least 3 months and underwent a one-on-one virtual semi-structured interview. Interviews were recorded, transcribed verbatim, and analyzed using reflexive thematic analysis. 'In-vivo' quotes from our sample were used to both craft titles for and provide evidence underlying each emerging theme. **RESULTS:** While our analysis identified six overarching themes, we focus on three, providing each with sufficient attention and space required for a thorough exploration and comprehensive demonstration. Theme 1, *'It's kinda validating, right?'* (Detroit) highlights how users found validation and reinforcement in their lifestyle choices and feelings about their well-being. Theme 2, *'It's really putting the power in my hands,'* (Misty) indicates users' curiosity and experimentation with their devices, leading to behavioral adjustments aimed at improving their readiness/recovery scores. Theme 3, potential for *'more of an emotional response rather than a rational one,'* (Brian) demonstrates the complex reactive responses users may have towards these scores and each wearable's interface. **CONCLUSION:** These findings provide preliminary insight into how COTSW readiness or recovery estimates influence users' behavior and self-perception through positive reinforcement and autonomy to modify decisions. However, integration of COTSWs into intervention or training contexts requires additional optimization-focused research, particularly aiming to minimize potential maladaptive effects elicited by their use.

TP107: EVALUATING THE IMPACT OF BMI ON THE ACCURACY OF ACTIGRAPH'S UNIAXIAL AND TRIAXIAL STEP-COUNT ALGORITHMS.

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BACKGROUND: Prior studies have reported mixed results regarding the effect of BMI on the accuracy of ActiGraph's ActiLife uniaxial step count algorithm. To our knowledge, no study has examined the effect of BMI on ActiGraph's triaxial Moving Average Vector Magnitude (MAVM) step count algorithm. Therefore, the purpose of this study was to evaluate and compare the effect of BMI on the accuracy of ActiGraph's ActiLife and MAVM algorithms. METHODS: Sixteen participants (age: 22.12±3.93y; BMI: 24.5±4.3 [range=18.3-33.6] kg/m^2) completed four × 3 mins bouts on a treadmill at 0.89, 1.34, 1.78 and 2.24 m/s while wearing an accelerometer (ActiGraph GT9X+) positioned at their waist. The accelerometers were initialized at a frequency of 30 Hz. Criterion step count was obtained by direct observation (hand count and video recording). Accelerometry data were processed to extract step counts using both the ActiLife and MAVM algorithms. Nested linear regression models were constructed (base model with algorithm step count as the single predictor vs. model with an interaction term [algorithm step count * BMI as a continuous variable]). Model fit was compared using F-tests. Kruskal Wallis rank-sum tests (BMI-categorical) examined the effect of BMI classification (normal, ≥18.5 to 24.9 kg/m^2; overweight, ≥25.0 to 29.9 kg/m^2; obese, ≥30 kg/m^2) on step count error from each algorithm across speeds. RESULTS: For the ActiLife algorithm, the F-tests of the nested regression models did not show improved model fit for the base model vs. the model with BMI as an interaction term, across all speeds (all p>.05). In contrast, for the MAVM algorithm, there was no difference between the models at 0.89 and 1.34 m/s; however, model fit was improved with the addition of BMI at 1.78 m/s (F=4.544, p<.05) and trended towards significance at 2.24 m/s (F=3.006, p=.087). Additionally, Kruskal Wallis showed no main effect on step count error at any speed for either algorithm. CONCLUSION: BMI does not appear to impact the accuracy of ActiGraph's ActiLife uniaxial step count algorithm. Importantly, our findings extend the current knowledge base for MAVM, revealing BMI affects its accuracy at faster speeds. Future studies should confirm these findings in a larger sample.

TP108: ACCURACY OF CORE TEMPERATURE ESTIMATION FROM WEARABLE DEVICES DURING EXERCISE

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BACKGROUND: Estimated core body temperature (T_c) from heart rate (HR) measured using wearable technology with photoplethysmography may be preferable to more expensive and invasive measures, but its accuracy is unknown. The purpose of this study was to compare T_c estimated from 2 different photoplethysmographic devices to a criterion measure of T_c during exercise in temperate and hot conditions. METHODS: 29 healthy adults (55% female; mean±SD, age=25±5 y, body mass=74.8±14.8 kg) completed 2 visits (TEMP, 22 °C; HOT, 35 °C). Participants inserted a flexible rectal thermistor for the measurement of rectal temperature (T_{re}), the criterion measure of T_c, and were outfitted with 2 wearable devices (SlateSafety BAND V2, Apple Watch Series 8). Data were recorded continuously during rest, 40 min of cycling (10 min each at 50%, 60%, 70%, 80% of age-predicted maximal HR), and recovery. T_c was estimated directly from HR by the SlateSafety device (T_{cSS}) and retrospectively from Apple Watch HR data (T_{cApple}) using an open-source algorithm. A two-way (intensity × device) repeated measures analysis of variance was used to compare T_{re}, T_{cSS}, and T_{cApple} in TEMP and HOT. An acceptable mean difference between device T_c and T_{re} of ±0.25 °C was set a priori. RESULTS: There was a significant intensity × device interaction during TEMP (P<0.001) and HOT (P<0.001). At rest, T_c was not different during TEMP (T_{re}=37.13±0.37 °C, T_{cSS}=37.07±0.30 °C, T_{cApple}=37.13±0.37 °C, all P>0.05) or HOT (T_{re}=37.04±0.31 °C, T_{cSS}=37.19±0.39 °C, T_{cApple}=37.04±0.31 °C, all P>0.05) but estimated T_c was greater than T_{re} and exceeded the ±0.25 °C acceptable difference at vigorous intensity exercise (80% HRmax) during TEMP (T_{re}=37.60±0.22 °C, T_{cSS}=38.35±0.15 °C, T_{cApple}=38.00±0.16 °C, all P<0.001) and HOT (T_{re}=37.55±0.32 °C, T_{cSS}=38.40±0.15 °C, T_{cApple}=38.00±0.14 °C, all P<0.001). CONCLUSIONS: HR-estimated T_c agreed with criterion T_c under resting conditions but overestimated T_{re} at higher exercise intensities.

TP201: PREDICTING ARTERIAL STIFFNESS FROM CARDIOVASCULAR DISEASE RISK FACTORS IN ADULTS WITH AND WITHOUT DOWN SYNDROME

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Adults with Down syndrome (DS) have a higher prevalence of obesity and diabetes and lower levels of moderate-to-vigorous physical activity (MVPA) than adults without DS. However, adults with DS typically have lower arterial stiffness than adults without DS despite the increased number of cardiovascular disease risk factors. PURPOSE: To investigate differences in cardiovascular disease risk factor profiles between adults with and without DS and whether risk factors predict their arterial stiffness. METHODS: Forty adults with DS (36±11 years) and 50 without DS (33±12 years) participated in this study. We measured body mass index (BMI), waist circumference (WC), blood pressure (BP), MVPA with accelerometry, and arterial stiffness with carotid-femoral pulse wave velocity (CF-PWV). We investigated differences between adults with and without DS using independent samples t-test and determined significant predictors of arterial stiffness from cardiovascular disease risk factors using stepwise linear regression. RESULTS: Adults with DS had higher WC, BMI, and MVPA, lower CF-PWV, and more total risk factors than those without DS (p≤.007). There were no significant differences between groups for age, weight, and BP (p≥.187). Age (p<.001, R^2 change=.33), DS (p<.001, R^2 change=.17), and waist circumference (p=.003, R^2 change=.06) contributed to the prediction model for CF-PWV (R^2=.56, p<.001) for the entire sample of adults with and without DS. Only age predicted CF-PWV in adults with DS (p<.001; R^2=.36), whereas age (p< .001, R^2 change=.52) and BMI (p=.002, R^2 change=.11) predicted CF-PWV (R^2=.63, p<.001) in adults without DS. CONCLUSION: Adults with DS had more cardiovascular disease risk factors than adults without DS. Aging contributes to arterial stiffness in both adults with and without DS, but to a lesser effect in adults with DS. Increased levels of overweight and obesity do not appear to negatively affect

arterial health in adults with DS.
Funding: Mississippi State University Office of Research and Economic Development and I'm An Athlete Foundation

TP202: FEASIBILITY OF HIGH-INTENSITY INTERVAL TRAINING IN OLDER ADULTS WITH HIV AND CO-OCCURRING HYPERTENSION

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BACKGROUND: As life expectancy for people living with HIV (PWH) has increased, there's been an increase in age-related comorbidities, like hypertension. Exercise is an important nonpharmacological strategy to counterbalance the adverse effects of chronic HIV infection. High-intensity interval training (HIIT) has been demonstrated to be safe and efficacious in improving health outcomes in individuals with chronic illness. The primary objective of this study was to assess the efficacy, safety, and feasibility of a 6-week HIIT intervention among older PWH and co-occurring hypertension. METHODS: PWH were recruited from the local HIV/AIDS Clinic the exercise intervention, which consisted twice per week cycle ergometry. This protocol was a center-based exercise program monitored by trained exercise physiologists. The primary endpoint of the study was the feasibility (e.g., consent rate, attendance, adherence, dropout rate) and participant perceived benefits and barriers assessed via the Exercise Benefits and Barriers Scale. Additional endpoints included cardiorespiratory fitness (6-minute walk test), changes in blood pressure (BP), anthropometrics (BMI), and ratings of pain. RESULTS: Thirteen of the 26 PWH contacted agreed to participate in the study (50% consent rate). Ten participants (76.9%) completed the study. Three reasons provided for dropping out of study include: 1) foot pain; 2) distance; 3) time commitment. Based on the 10 completers, there was a 100% adherence rate based on the prescribed exercise intensity (70-80% of heart rate maximum). On average, 86.7% of exercise sessions were attended by older PWH. Additionally, the participants perceived exercise more positively and perceived less barriers to exercise following the exercise intervention. BP and BMI both decreased following the intervention, while distance walked during the 6-minute walk test declined following the intervention. On average, the completers were 60.5 years old, 50% Black, and 60% Male. CONCLUSIONS: This exercise program is feasible for older PWH and co-occurring hypertension and may improve blood pressure, BMI, and perceptions of exercise. While the program was safe and participants showed some improvements, incorporating approaches to enhance recruitment and adherence is critical.

TP203: RELATIONSHIPS BETWEEN GRIP STRENGTH DISCREPANCY AND COGNITIVE FUNCTION IN INDIVIDUALS DIAGNOSED WITH DEMENTIA

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BACKGROUND: Easily measured, inexpensive biomarkers of cognitive decline are of increasing interest as the U.S. population ages. Recent studies have investigated grip strength discrepancy (GSD) as one such biomarker. However, limited research has focused on GSD in individuals with diagnosed dementia across specific cognitive domains such as verbal fluency, verbal learning, and psychomotor and executive function. This study aimed to investigate whether a greater GSD was associated with more severely impaired cognition in a group of participants in a cognitive rehabilitation program. METHODS: Bilateral grip strength was assessed with a Jamar J00105 hydraulic hand dynamometer in six program participants (3 men, 3 women) (age 73.5±6.76 y), and percent contralateral strength difference was used to quantify GSD. Verbal fluency was assessed with Controlled Oral Word Association Test (COWAT); verbal learning and memory with the Hopkins Verbal Learning Test-Revised (HVLT-R); and psychomotor and executive function with Trail Making Tests (TMT) A and B. Analysis of covariance (ANCOVA) was used to assess associations between GSD and domains of cognitive function. RESULTS: Mean GSD was 38.6±28.5%. After adjusting for effects of age and sex, ANCOVA showed the following effects of GSD: no significant effect on verbal fluency (p=0.330); a trend toward a significant effect on verbal learning (p=0.091); no significant effect on psychomotor function (p=0.150); and a significant effect on executive function (p=0.028) CONCLUSIONS: In this preliminary analysis, there was a significant effect of GSD on executive function and a trend toward a significant effect of GSD on verbal learning; no effects of GSD were found on verbal fluency or psychomotor function. Further study is warranted in individuals with and without diagnosed dementia to investigate high GSD as a reliable biomarker of dementia across these domains of cognitive function and to investigate underlying physiological mechanisms.

TP204: INFLUENCE OF 16-WEEK MINIMAL EXERCISE INTERVENTION ON STRENGTH MEASURES IN TYPE-2 DIABETEICS

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Background: A relationship between exercise and improved metabolic health is well established, however time availability for exercise remains a commonly-reported barrier. Common interventions for individuals with type 2 diabetes (T2D) are aerobic based, and do not emphasize muscular strength. Recently, a High Intensity Bodyweight Circuit (HIBC) regimen requiring a maximum 40-min of exercise weekly has been developed, but its effect on strength is unknown. Purpose: To determine the effect of a 16-week intervention of a minimal dose HIBC program in persons with T2D on strength adaptations. Methods: Participants between the ages of 40-65 diagnosed with T2DM were recruited for this study. Pre and Post measures of strength were assessed via isokinetic knee flexion and extension at 60 and 180 deg/sec angular velocities and reported as peak torque during extension (PTE) and flexion (PTF) for 60 and 180 deg/sec and average torque during extension (ATE) and flexion (ATF) for 60 and 180 deg/sec. Hand grip (HG) strength was measured pre and post intervention to assess upper body strength. Participants completed the 16-week bodyweight circuit training (10 TRX-assisted bodyweight squats, 5 modified pull-ups, 5 modified push-ups, 10 abdominal crunches). Participants completed as many cycles as possible each session. Session duration progressed from 5-10 minutes, and session frequency progressed from 3-4 sessions per week, as tolerated. Assessments were repeated after 16 weeks of training. Results: A total of 7 participants completed the study: Female (n=2) (54 +/- 5.6yr) Male (n=5) (53 +/- 1.5 yr). A paired samples t-test demonstrated no significant differences between pre and post measures of PTE60 (p = .738), PTF60 (p = .530), PTE180 (p = .273), PTF180 (p = .227), ATE60 (p = .707), ATF60 (p = .094), ATE180 (p = .240), ATF (p = .298), HG right (p = .300), or HG left (p = .358). Conclusion: HIBC failed to make significant changes in various strength markers. The sample size is relatively small, a greater number of participants are needed to determine the full effect.

TP205: HIGH-INTENSITY VS. MODERATE-INTENSITY EXERCISE ON VENTILATORY EFFICIENCY AND OXYGEN UPTAKE IN PATIENTS WITH BREAST CANCER

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Introduction: Ventilatory efficiency and oxygen uptake efficiency slopes (OUES) predict morbidity and mortality independent of VO_2peak, and exercise can improve these parameters in patients with cardiovascular disease. However, it is unknown if exercise has the same effects in patients with breast cancer (BC) receiving chemotherapy and the role of exercise intensity is unclear. **Purpose:** This secondary analysis examined if high-intensity interval training (HIIT) was more effective than moderate-intensity exercise training (MOD) for the preservation of ventilatory efficiency and OUES following chemotherapy in females with BC. **Methods:** Twenty-four patients with BC scheduled for chemotherapy were randomized to 1 of 2 interventions 1) MOD: 150min/week of walking at 70-75% peak heart rate (PHR) or 2) HIIT: 3 sessions/week of 4x4 intervals at 85-95% PHR on a recumbent bicycle. Subjects underwent VO_{2peak} testing on a recumbent bicycle using a 15 watt/min ramp protocol to obtain breath-by-breath data and PHRs for exercise prescription. Post-testing occurred within 3-10 days after the final treatment. Individual deltas for VE/VO_2, VE/VCO_2, and OUES slopes from between-group differences were analyzed via independent samples t-tests after assessing for normality. Alpha was *a priori* set at 0.05. **Results:** Thirteen subjects completed all aspects of the study (MOD: n=6, 54.2±10.3yrs, 65.6±7.4kg, 25.1±4.3kg/m^2; HIIT: n=7, 55.3±11.9yrs,

78.7±15kg, 28.9±5.5kg/m^2). There were no significant differences between MOD or HIIT for changes in overall VE/VO_2 slope (9.88±12.87 vs. 2.32±9.75; p=0.25, d=0.67), overall VE/VCO_2 slope (2.83±4.66 vs. 2.42±3.54; p=0.86, d=0.10), OUES (-0.34±0.14 vs. -0.16±0.25; p=0.14, d=0.88), VE/VO_2 slope pre- or post-VT, VE/VCO_2 slope pre- or post-VT from baseline values (p>0.05). **Conclusion**: VE/VO_2 slopes and OUES were worse in the MOD following BC chemotherapy vs. HIIT. Large effect sizes (d > 0.7) were observed; however, the present study was underpowered and needs to be replicated in a larger sample of patients. Funding: UVA CPH & iPRIME Seed Funding

TP206: DOES HOME-BASED EXERCISE REDUCE INFLAMMATION AND IN VITRO CELLULAR PROLIFERATION DURING ADVANCED PROSTATE CANCER?

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BACKGROUND: Although prognosis and survivorship for metastatic castrate-resistant prostate cancer (mCRPC) are improving through more effective screening and treatments, patients are living longer with treatment-related side effects. Exercise is safe and feasible in prostate cancer (PC) patients with less advanced disease, reducing treatment side effects and improving quality of life. Amongst the potential benefits of exercise that have been explored to a lesser extent are potential direct effects on cancer development and progression. *In vitro* studies using supervised exercise have demonstrated that exercise reduces PC cell growth in both local and advanced PC. However, no research to date has examined this in home-based interventions, which are more accessible and scalable and can target individuals living in rural areas. Therefore, the aim of this study is to investigate if an at-home exercise program alters PC cell growth and apoptosis along with circulating cytokines. METHODS: 16 inactive men with mCRPC receiving androgen receptor signaling inhibitor (ARSI) completed a 12-week home-based exercise intervention using progressive walking and resistance training 2-4 times per week. Each participant completed anthropometric testing and provided blood samples before and after the intervention. PC cell lines (LNCaP and DU145) will be cultured and treated with 10% serum obtained before and after the intervention. Cell growth will be assessed by Alamar blue and cell apoptosis will be detected by Annexin V/PI via flow cytometry. A multi-plex assay and a CRP ELISA will be used to investigate levels of circulating cytokines. Training-induced changes in cell proliferation, apoptosis, and cytokines will be assessed using linear mixed models. ANTICIPATED RESULTS: It is hypothesized that a home-based exercise intervention will result in reduced cancer cell growth and increased apoptosis that will correlate with reductions in inflammatory markers. However, these changes will be smaller than those of supervised interventions reported in the literature.

TP207: EFFECTS OF RESISTANCE EXERCISE ON FATIGUE IN SURVIVORS OF CANCER

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BACKGROUND: Cancer-related fatigue (CRF) is a common and debilitating side effect experienced during and after treatment. While aerobic exercises are known to help with CRF, the impact of resistance exercise is less clear. Given its role in enhancing muscle strength and function, resistance exercise may offer unique benefits for CRF management. Therefore, studying its independent effects is crucial for understanding its potential as a targeted intervention. METHODS: Participants were recruited from local hospital systems in the Midlands region of South Carolina. Eligibility criteria included individuals ≥ 18 years of age previously treated for cancer. Participants completed a supervised resistance exercise program, consisting of 2 sessions/week for 8 weeks. Each session included 6-8 resistance exercises targeting the major muscle groups of the upper and lower body. Fatigue was measured using the 13-item Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) survey before and after the intervention. Changes in fatigue were analyzed using a linear mixed-effects model, controlling for baseline fatigue. An exploratory multi-variate linear regression examined the influence of baseline fatigue, age, BMI, cancer stage, time since diagnosis, chemotherapy exposure, and physical function on changes in fatigue. RESULTS: Eighty-one cancer survivors (8 men, 73 women; mean age 60 ± 10, BMI 31 ± 8) primarily treated for breast cancer (74%) completed the intervention. Significant improvements were observed in FACIT-F scores post-intervention (mean increase = 5.88, p < 0.001, MCID = +4), indicating reduced fatigue. Baseline fatigue was the only significant predictor, with greater baseline levels of fatigue associated with greater improvements. Other factors, including age, BMI, cancer stage, time since diagnosis, chemotherapy exposure, and physical function, did not significantly impact changes in fatigue. CONCLUSION: Resistance exercise effectively reduced CRF in cancer survivors, as reflected by the significant improvement in FACIT-F scores. Baseline fatigue influenced the extent of improvement, while other factors did not. These findings suggest resistance exercise is effective for managing CRF and highlight the need for further research to explore mechanisms and long-term benefits.

TP208: MUSCLE MATTERS: PHYSICAL ACTIVITY PROTECTS AGAINST CANCER-INDUCED MUSCLE LOSS

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Introduction: Cancer cachexia is a progressive muscle wasting syndrome largely characterized by a loss of lean muscle mass and strength and thus results in significant functional impairment. Increasing evidence suggests that aerobic exercise offers protective benefits for cachectic cancer patients; however, the exact mechanism of how exercise attenuates muscle wasting is still unknown. Therefore, the purpose of this study was to 1) determine if rehabilitative physical activity (voluntary wheel running) concurrent with tumor-bearing preserves muscle mass and function and 2) determine the underlying mechanisms. **Methods:** Male mice were randomly assigned to groups: sedentary non-tumor (SED+NT), sedentary tumor (SED+T), wheel running non-tumor (WR+NT), and wheel running tumor (WR+T). On day 1, mice were inoculated with 5x10^5 Lewis lung carcinoma cells in the flank. The study lasted 4 weeks, during which the WR mice groups had unlimited access to running wheels. Echocardiograms and grip strength tests were performed on days 0 and 28 to measure heart and skeletal muscle function. **Results:** Male tumor-bearing mice displayed the poorest cardiac function among all groups. However, rehabilitative physical activity (wheel running) protected against tumor-mediated declines in cardiac function (fractional shortening - SED+T: 41% vs WR+T: 53%, P<0.001). Moreover, the SED+T group showed the highest cardiac protein expression of MuRF1, Atrogin-1, and GDF-15, and these protein levels were seen to be reduced in the WR+T group. Given the role these proteins play in muscle atrophy, these data show a clear relationship between protein degradation and the protective effects of physical activity. Exercise also preserved muscle strength and overall body mass; the SED+T group displayed the largest decrease in grip strength, which was preserved in the wheel running group. **Conclusion:** Rehabilitative physical activity (voluntary wheel running) begun at the time of tumor implantation was shown to decrease tumor-induced muscle wasting, preserve muscle mass and grip strength, and decrease degradative pathways in both skeletal and cardiac muscle of tumor-bearing mice. The identification of degradative proteins highlights specific therapeutic targets, paving the way for more effective treatment for cancer cachexia.

TP301: INVESTIGATION OF SURFACE ELECTROMYOGRAPHIC FREQUENCY DYNAMICS IN FEMALES DURING SUSTAINED, SUBMAXIMAL, ISOMETRIC EXERCISE

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BACKGROUND: Despite existing policies advocating for the inclusion of females in sport and exercise science research, data on motor unit behavior in this population remain sparse. Consequently, this study aimed to examine the temporal dynamics of surface electromyographic (sEMG) frequency parameters during a fatiguing, submaximal, unilateral, isometric leg extension muscle action. METHODS: Ten recreationally active females (Mean±SD: Age = 23.5±4.2 y; Height =

164.8±6.3 cm; Weight = 68.7±13.8 kg) performed a sustained isometric contraction at 50% of their peak maximal voluntary isometric contraction (MVIC) force until task failure, defined as the inability to maintain the target force despite verbal encouragement. sEMG signals from the vastus lateralis of the non-dominant limb were analyzed using a wavelet-based transformation. To quantify the impact of fatigue on the temporal dynamics of the sEMG signal's frequency content, the relative change in spectral intensity from the beginning to the end of the task was examined across wavelets using a linear-mixed effect model, which included a fixed effect of wavelet, operationalized as a continuous log-transformed variable. The model also included random intercepts per participant to appropriately address the repeated measures design, and a maximal random effect structure to account for potential variances amongst the within-participant variable. RESULTS: The mean and standard deviation for time-to-task failure was 44.7 ± 29.4 seconds. Statistical analysis revealed significant variability in spectral intensity across different wavelets, as indicated by a wavelet effect (β [CI95%] = -0.007 Δ [-0.01, -0.004]; t = -5.759; p < 0.001). Specifically, there were increases in spectral intensity at lower frequencies and decreases at higher frequencies.CONCLUSION: This analysis offers detailed insights beyond standard composite measures, revealing fatigue-induced changes in spectral intensity that suggest distinct motor control strategies during exercise. Specifically, increases in lower frequency intensities and decreases in higher frequencies may reflect the compensatory recruitment of motor units with varying thresholds, implying adaptive strategies to maintain performance under fatigue conditions in females.

TP302: SEX DIFFERENCES IN NETWORKS OF INTER-MUSCULAR COORDINATION

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BACKGROUND: Sex differences in inter-muscular coordination are critical for understanding how males and females respond differently to exercise and training; however, this topic is not yet well understood. In this study, we investigated sex differences in inter-muscular network interactions and their temporal variability during a squat test. **METHODS:** Eleven males and twenty-seven females performed bodyweight squats at a regular pace (1 squat/6 sec) until exhaustion, with simultaneous surface electromyography (sEMG) recordings taken from the left and right vastus lateralis and erector spinae longissimus muscles. sEMG signals were decomposed in ten frequency bands [F1-F10], representing the dynamics of distinct muscle fiber types. We next quantified pair-wise coupling (cross-correlation *C*) for each pair of EMG spectral power frequency bands across all Leg and Back muscles. Finally, to assess the temporal variability of inter-muscular coordination, we computed cross-correlation moving averages with a 3-second resolution for each pair of EMG frequency bands across all Leg and Back muscles, and calculated the coefficient of variability (*CV*) of the obtained time series. **RESULTS:** Overall, females showed significantly stronger strength links, i.e., higher inter-muscular coordination (C_{MEAN} = 0.65; *SD* = 0.15) compared to males (C_{MEAN} = 0.5; *SD* = 0.2; $p < 0.05$). However, females exhibited significantly lower temporal variability in inter-muscular coordination (CV_{MEAN} = 0.41; S*D* = 0.7) compared to males (CV_{MEAN} = 0.22; *SD* = 0.15; $p < 0.05$), particularly when higher EMG frequency bands, associated with type II muscle fibers, were involved. **CONCLUSION**: The lower temporal variability in inter-muscular coordination observed in females may be related to their lower proportion of type II muscle fibers, and suggests that they may have greater network rigidity and lower adaptability to effort compared to males during exercise. This network-based approach provides new insights into explaining sex differences in muscle performance and function.

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TP303: ASSESSING THE RELATIONSHIPS BETWEEN SKATER JUMP GROUND REACTION FORCES, HIP ABDUCTION STRENGTH, AND PITCH VELOCITY

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BACKGROUND: The mechanics of an overhand baseball pitch rely on force development from the lower extremities and efficient force transfer superiorly through the kinetic chain. One component of this force is the pitcher's ability to produce lateral force towards the target via hip abduction and internal rotation. Lateral force production is necessary to supplement the ability to produce velocity on pitches, as vertical ground reaction forces (VGRF) can reach over 2x body weight (BW) or greater during the pitching motion. Lateral skater jumps (LSKJ) utilize a similar movement pattern compared to the transition phase from drive leg to stride leg. The purpose of this study is to determine if potential correlations exist between VGRF during LSKJ and medial lateral ground reaction forces (MLGRF), isometric hip abduction strength (HABD), and pitching velocity (PV) in high-level pitchers. METHODS: Data from 23 high school and collegiate pitchers (17.65±1.87yrs, 1.85±.01m, 87.3±11.62kg) were retrospectively analyzed. The averages VGRF and MLGRF of 2 LSKJs were analyzed. The average PV of 5-10 fastballs was recorded for each pitcher and isometric HABD was measured with a handheld dynamometer. Pearson correlations were conducted to determine possible relationships between variables. RESULTS: A positive correlation was noted between average push-off MLGRF relative to BW in the drive leg and PV (r=.65). In addition, a positive correlation was noted between %MLGRF/VGRF relative to BW in the drive leg and PV (r=.44). Furthermore, a positive correlation was observed between MLGRF relative to BW and HABD in the drive leg (r=.41). CONCLUSIONS: The results suggest that an increased ability to produce lateral forces from hip abduction and internal rotation through the transition phase from drive leg to stride leg may contribute to an increase in PV. Increasing the sample size and further analysis is needed to continue investigation into these relationships.

TP304: EXAMINATION OF DIFFERENCES IN MUSCLE ACTIVITY OF THE PRIMARY ANKLE STABILIZERS IN ATHLETES AND NON-ATHLETES PERFORMING A DYNAMIC BALANCE TEST

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BACKGROUND: Ankle sprains are a frequently occurring injury among women's soccer players. Current research on the muscle activity of the tibialis anterior (TA) and the medial gastrocnemius (MG) in elite athletes and non-athletic populations is limited. The purpose of this study was to assess differences in muscle activation of the TA and MG in athletes and non-athletes while performing a dynamic balance task. METHODS: Twenty-One Division 1 NCAA women's soccer players and 19 non-athlete college aged females performed the Y-Balance Test (YBT), while muscle activity of the TA and MG was measured using surface electromyography (EMG). Participants reach in three directions (anterior, posteromedial, and posterolateral) during the YBT. EMG readings from the TA and MG for each reach distance were recorded and normalized to the participant's maximum voluntary isometric contraction. Two separate 2 (group) x 2 (leg) x 3 (reach direction) ANOVAs with repeated measures on the leg and reach direction were run on muscle activity of the TA and MG. RESULTS: The TA and the MG reported significant group differences in muscle activation (TA: $F = 45.287$, $p < .001$, $\eta_p^2 = .544$; MG: $F = 28.094$, $p < .001$, $\eta_p^2 = .425$). For the TA, the non-athletic group had 39.840% higher muscle activity, and for the MG, the non-athletic group had 33.152% higher muscle activity. Also for the TA, there was a significant main effect for reach direction ($f = 8.8660$, $p < .001$, $\eta_p^2 = .189$). Post-hoc analyses revealed muscle activity was significantly greater in the posterolateral direction when compared with the anterior ($p = .002$) and posteromedial ($p < .001$) directions. CONCLUSIONS: Soccer players in this study displayed significantly lower muscle activity than non-athletes when performing a dynamic balance task, which may be due to their high-level training status. This may lower their risk of injury, but more research is needed into the specific clinical implications of these findings.

TP305: COMPARATIVE ANALYSIS OF CONDITIONED PAIN MODULATION AND MUSCLE QUALITY IN YOUNGER VS. OLDER ADULTS

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BACKGROUND: Aging often influences pain sensitivity, muscle weakness, and atrophy, which can diminish quality of life and affect how pain is perceived and managed. Conditioned pain modulation (CPM) efficiency, a mechanism of pain inhibition, may vary between younger and older adults. Examining the relationship between pain response measures and muscle quality (MQ)—strength relative to mass—could identify age-related pain modulation changes and potential intervention targets. **PURPOSE:** The primary aim of this study was to examine differences in CPM for younger versus older adults. Our secondary aim was to examine associations between age-specific CPM responses and measures of quadriceps MQ. **METHODS:** 25 younger adults (12 males, 13 females; mean ± SD age = 22±2 years; BMI = 25.3±3.0 kg/m^2) and 12 older adults (6 males, 6 females; age = 70±8 years; BMI = 27.2±3.8 kg/m^2) visited the laboratory 3 times. Maximal strength testing of the dominant quadricep was conducted during isometric (90° joint angle) and concentric muscle actions at velocities of 180 and 300°/second. CPM was conducted with heat and pressure pain threshold testing stimuli on the non-dominant forearm pre/post conditioning stimuli (cold-water immersion of dominant hand). **RESULTS:** Aim 1: Older adults showed a more efficient pain inhibition response to the heat test stimuli (-3.82±3.67° C) versus younger adults (-1.31±2.62° C) (p=.022; d=0.838). There were no significant differences in pressure stimuli responses between groups (p=0.220); however, the effect size was moderate (d=0.439). Aim 2: Younger adult measures of absolute and relative concentric power were moderately and inversely associated with pressure CPM (mean r = -0.388), but no measures were related to heat CPM (p>.05). In older adults, positive, medium/strong associations between all measures of MQ versus heat CPM were observed (r = 0.309-0.630), with weak, non-significant associations between MQ and pressure CPM (r = -0.210-0.264). **DISCUSSION:** Older adults had a more efficient inhibitory response to heat pain than younger adults. Associations differed between MQ and CPM across groups: muscle power linked to pressure CPM for both, while muscle mass was associated with heat CPM in older adults. This data warrants further research on relationship among aging, pain modulation, and MQ.

TP306: DESCRIPTIVE CHARACTERISTICS AND RUNNING BIOMECHANICS OF MALE DISTANCE RUNNERS WITH PREVIOUS RUNNING RELATED INJURY

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BACKGROUND: Running shoe companies have designed footwear tailored to foot type, providing comfort and/or stability through reduction of forefoot and rearfoot impact forces and control of rearfoot motion during running. However, it is unclear whether footwear creates the adjustments intended for the foot type even when runners have experienced a previous running related injury. Thus, the purpose of this study was to describe footwear selection, foot type, and running biomechanics in previously injured male distance runners to explore similarities and patterns using a case series approach. METHODS: Six participants completed this case series. Cases 1 and 3 were recreational runners, Cases 2, 4, and 5 were professional athletes, and Case 6 was a coach for a professional sport team. All participants had a history of lower extremity running related injury within the last year, but no current injury. A questionnaire on shoe selection and injury history, the Foot Posture Index-6, dorsiflexion range of motion (DFROM) using the Weight Bearing Lunge Test and running trials in a biomechanics lab were completed. Max vertical, anteroposterior, and mediolateral ground reaction force (GRF) per limb were recorded as N/kg. Frontal and sagittal plane kinematics of the ankle were calculated for initial contact (IC), absorption, propulsion, and toe-off. Vertical and anteroposterior GRF were used with a 10N threshold to determine these phases. Cases were compared to identify similarities or patterns associated with injury history, shoe selection process, foot characteristics, habitual footwear, and kinematics and kinetics. RESULTS: Cases 3 and 4 with previous Achilles/shank injuries had a DFROM asymmetry $\geq$2cm with reduced DFROM in the affected limb. Case 4 sought care after injury and Case 3 did not. Case 3 was the only highly pronated foot type and using footwear not recommended for overpronation. Case 3 was plantarflexed at IC, lacked dorsiflexion at absorption, lacked foot progression into eversion, and had the highest vertical GRF compared to all other cases. Despite the asymmetry, Case 4 had close to normative DFROM and typical foot progression. CONCLUSIONS: Injury history may affect long-term DFROM if not rectified. Reduced DFROM coupled with overpronation and incorrect footwear may influence running biomechanics.

TP307: VALIDATION OF MARKERLESS MOTION CAPTURE FOR KNEE JOINT KINEMATICS: A COMPARATIVE PILOT STUDY

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This pilot study aims to validate a markerless motion capture system by comparing its ability to measure knee joint kinematics during clinical assessments with an established marker-based system. Accurate measurement of knee joint kinematics is crucial for analyzing gait patterns. The study utilized the Vicon Motion System and OpenCap, an open-source software for biomechanical modeling, to collect data simultaneously during a 10-meter walk test at a self-selected pace. The correlation between the measurements of both systems was high, with an (R^2) value of 0.9931, indicating a strong agreement between the two systems. Statistical analysis showed that the p-value was greater than 0.05, and the t-statistic of 0.36 fell within the range of -2.04 to 2.04, leading to a failure to reject the null hypothesis. On average, OpenCap measured 3.48° more knee flexion than Vicon when considering one gait cycle. The average bias for knee joint angles in this study was 3.48°, which is lower than the mean absolute error (MAE) reported in other literature for walking trials, which ranged from 2.3° to 6.6°. These results suggest that OpenCap can produce valid measurements for clinical analysis, supporting its use as a cost-effective tool for assessing movement patterns in clinical settings.

TP401: THE EFFECT OF POLICE OFFICER PROTECTIVE GEAR ON MOBILITY, STABILITY, AND POWER GENERATION

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BACKGROUND: Protective gear is a critical part of the police officer uniform. The 9kg+ gear is cumbersome due to its rigidity and bulk, creating physical performance deficits. Mobility, balance, and power generation are essential to completion of an officer's daily tasks. Few studies have assessed the effect of police protective gear on these important capabilities. Understanding the change in physical capabilities resulting from protective gear is critical to the safety and survival of the police officer. The purpose of this study was to evaluate the impact of protective gear on officer capabilities.
METHODS: Police officers from a medium-sized city volunteered for this study (male=68, female=4; ages 21-65). Officers completed an 11-point assessment evaluating power generation, balance, functional movement, and flexibility in two conditions: athletic attire (No Gear) and uniform + protective equipment (Gear). Paired t-tests were conducted to evaluate police officers' movement capabilities in each condition. Balance testing analysis indicates officers in gear have significantly decreased stability in path length and mean velocity, but comparisons of standard ellipse areas indicated officers are able to compensate for this instability.
RESULTS: Results indicate a significant decrease in performance in: vertical jump height (t_{71}= 13.51, p<0.001), power generation per kg (t_{71}=7.13, p<0.001), modified pushup (t_{71}= 3.17, p=0.002), overhead squat (t_{71}= 2.43, p=0.018), and sit-and-reach length (t_{71}= 12.41, p<0.001). Decreased physical capability in balance, mobility and power generation were apparent when comparing the "Gear" and "No-Gear" conditions.
CONCLUSIONS: Decreased on-duty performance can affect officer safety and success. These results indicate the need for continued evaluation and improvement of police officer safety equipment to ensure mobility and safety.

TP402: EVALUATING A STANDARDIZED POLICE ACADEMY'S PHYSICAL TRAINING ON FITNESS OUTCOMES

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BACKGROUND: Police academies are essential for developing law enforcement skills but often lack instructors formally trained in strength and conditioning for physical training (PT). PURPOSE: This study evaluated the effectiveness of a standardized statewide police academy PT program on occupational fitness variables. METHODS: 937 cadets from 10 centers completed a 12-week training program in a southern US state. Strength and conditioning specialists collaborated with academy instructors to design a standardized PT program. Paired samples t-tests assessed changes over time, and independent samples t-tests evaluated sex differences, with a significance threshold set at .05. RESULTS: Statistically significant improvements ($p<.05$) were found in all measures: BMI decreased by .30 kg/m², grip strength increased by 7.72 lbs, vertical jump by 1.11 in, push-ups by 6.20, plank time by 28.74s, 300-m shuttle time decreased by 3.93s, and agility T-drill time by .87s. Males showed a smaller BMI decrease (-.25 vs -.53 kg/m², $p<.001$), greater grip strength increase (+8.83 vs +1.81 lbs, $p=.012$), fewer push-ups (+5.9 vs +7.8, $p=.008$), and a smaller agility decrease (-.81 vs -1.23s, $p=.009$). No significant sex differences were noted for changes in vertical jump ($p=.063$), plank time ($p=.124$), and shuttle time ($p=.072$). Self-reported injury rates averaged under 2.5%, with the incidence of severe injuries dropping from 15 to 0 in later sessions. CONCLUSION: A standardized PT program effectively enhances occupational fitness and reduces injury risk among police cadets.

TP403: PERFORMANCE DIFFERENCES BETWEEN HIGH AND LOW ACHIEVERS ON THE AIR FORCE ROTC PERFORMANCE FITNESS ASSESSMENTS

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Background: Achieving a passing score on the Air Force physical fitness assessment (PFA) is mandatory for contracting into the Air Force Reserve Officers' Training Corps (AFROTC) as they prepare for future enlistment in the Air or Space Forces. While failing PFA scores lead to dismissal from the AFROTC program, higher passing PFA scores better equip AFROTC cadets for success post-enlistment and improves their odds of obtaining more competitive professional development opportunities. The aim of this study was to characterize the performance and body composition differences of AFROTC cadets across PFA categories. **Methods:** for this cross-sectional evaluation, a total of 43 University AFROTC cadets (M=24, F=19) arrived at the laboratory between 500-1100 h and completed 3 isometric mid-thigh pulls and a DXA scan to evaluate their lower body strength and body composition, respectively. On a separate day, cadets performed the PFA (timed sit-ups, push-ups, and 1.5 mile run) and were subsequently stratified into pass/fail (pass: ≥75 pts) and unsatisfactory (<75 pts), satisfactory (75-88.9 pts), and excellent (≥90 pts) groups in accordance with their scores. Differences in performance and body composition by PFA categories were evaluated using ANCOVAs adjusted for academic classification. **Results:** Cadets with passing PFA scores had significantly lower body fat percentage (BF%) and higher peak force (relative, average, 200 and 300ms) and total body, arm, and appendicular lean mass ([ALM] all $p\leq0.04$). Compared to excellent, cadets with unsatisfactory PFA scores had significantly higher BF% and lower peak force (relative, average, 200 and 300 ms), fat-free mass index, and total, arm, and ALM ($p\leq0.035$). BF% ($p=0.004$) and relative peak force ($p=0.018$) were lower for cadets with unsatisfactory PFA scores compared to cadets with satisfactory scores. No significant differences were observed between satisfactory and excellent. **Conclusions:** AFROTC cadets with higher performance on the PFA demonstrate lower BF%, greater lean mass estimates, and higher peak force production compared to lower performers. AFROTC physical training programs should have a targeted focus on lowering BF% and increasing upper body lean mass and lower body force production to better facilitate the cadets' advancement within PFA score categories.

TP404: EFFECTS OF AN UNDULATING TRAINING PROGRAM WITHIN THE FIRE SERVICE: A PILOT STUDY

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BACKGROUND: Firefighting is a physically demanding occupation and requires a high level of health and fitness for optimal performance. Limited research has investigated the effects of an undulating training (UT) program on fitness variables among career firefighters (FFs). This study utilized a peer fitness leader (PFL) approach to examine the effectiveness of an 8-week UT program on body composition, strength, power, and fire suppression task (FST) time. METHODS: This quasi-experimental study examined the effects of an 8-week UT program on body composition, strength, power, and FST time. A convenience sample of 49 full-time FFs from a southeastern United States fire department participated in the study. The program had three phases: strength/power, muscular endurance, and occupational specific tasks. Each week, FFs completed two, 45-minute workouts led by a trained PFL. Independent samples t-tests were used to examine pre- and post-differences in body composition (body mass index [BMI], body fat percentage, and muscle mass), strength (handgrip), power (countermovement jump [CMJ]), and FST time. RESULTS: Pre- and post-training data are available for 42 FFs. Handgrip strength significantly increased by 4.3 lbs (SD = 11.2, p= .02), and the FST time significantly decreased by 16.1 sec (SD = 31.6, p = .003). Results also indicated significant increases in BMI (0.4 kg/m2, SD = 0.45, p = .03) and body fat percentage (0.7%, SD = 2.1, p = .03). While there was an increase in muscle mass by 0.4 lbs (SD = 2.4, p = .28) and CMJ by 0.1 in (SD = 1.8, p = .85), increases were not statistically significant. CONCLUSIONS: This 8-week UT program significantly improved handgrip strength and FST time. These results provide insight into the effectiveness of a PFL-led UT program in improving strength and FST time within the fire service. Future implementation of a PFL-led UT program should emphasize body composition variables such as BMI and body fat percentage.

TP405: ANAEROBIC AND CARDIOVASCULAR RESPONSES TO SOLO AND TEAM LIVE FIREFIGHTER RESCUE

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BACKGROUND: The ability of a firefighter (FF) to perform live fire rescue operations in the field is an imperative skill; however, the physiological demands associated with solo or team live fire rescues (LR) have not been thoroughly explored. The purpose of this study is to compare physiological responses of FF recruits during solo or team LR. METHODS: 20 FF recruits (sex 18M, 2F; age 22.9 ± 5.5 yrs) performed a LR in two rotations, one solo LR and one team LR, the order of which was randomized into rotation 1 (Rot1) or 2 (Rot2), while carrying an extra 18-22 kilograms with full turnout gear and Self-Contained Breathing Apparatus. Heart rate (HR) was measured continuously with Zephyr® monitors, and lactate was measured via capillary finger prick at three time points: baseline, after Rot1, and after Rot2. Peak and average HR were calculated per rotation, summarized as a percentage of age-predicted maximum HR (e.g., %HRpeak and %HRavg, respectively). Data were analyzed with a repeated-measures ANOVA and paired samples t-test for within group analysis of HR and lactate concentration. RESULTS: A significant effect of condition ($p<0.05$) was found for lactate, with solo LR having a higher lactate (7.1 ± 2.2 mmol/L) than team LR (4.1 ± 1.8 mmol/L), with no effect of time or time × condition. There was a significant effect of time for %HRavg ($p<0.05$) and of condition for %HRpeak ($p<0.05$) and interaction of time × condition for both cardiovascular strain indices ($p<0.05$), specifically, %HRavg was significantly higher for Rot2 (87.1% ± 7.5%) than Rot1 (82.6% ± 6.7%), while %HRpeak was higher for team LR (10a 1.4% ± 6.3%) than solo LR (97.8% ± 4.5%). CONCLUSION: Solo FF LR demands more sustained anaerobic effort, as shown by elevated lactate levels, while group LR appears to produce sharper cardiovascular spikes, demonstrated by higher %HRpeak. These findings highlight the differing physiological demands of solo versus group LR, both eliciting high cardiovascular strain.

TP406: INCUMBENT FIREFIGHTERS EXHIBIT HIGHER LEVELS OF PHYSICAL PERFORMANCE COMPARED TO RECRUITS

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Physical fitness (PF) is crucial for firefighter performance and reduces the risk of cardiovascular disease and job-related musculoskeletal injury. No study has compared measures of PF between firefighter recruits and incumbents, using both field and laboratory-based measures. Recruits' fitness usually increases during the academy and declines throughout their career. Therefore, this study aimed to quantify baseline PF characteristics of firefighter recruits compared to incumbents. Firefighter recruits (N = 32, Female = 1, age = 24.9 ± 8.0y) participated in field-based testing, with 18 (Female = 1, age = 26.2 ± 9.2y) of them also completing laboratory-based testing at the start of the academy. Nine incumbents (age = 29.5 ± 7.8y, experience = 6.4 ± 6.3y) participated in both field- and lab-based fitness testing during the same period. Physical activity (PA) levels over the prior 3 months were reported. Assessments included field-based (waist-to-hip ratio [WTH], handgrip strength, maximum sit-ups, push-ups, and pull-ups, and 1.5-mile run) and laboratory-based (body composition, countermovement jumps with hands-on-hips [CMJ_{HOH}], isometric mid-thigh pull [IMTP], and maximal oxygen consumption [VO_2max]) tests. Independent sample t-tests were performed to determine group differences (α=0.05) and effect sizes were calculated. Incumbents exhibited higher levels of PA ($p = 0.004$, ES = 1.3). No group differences were found for WTH, handgrip strength, fat-free mass, or peak IMTP force ($p > 0.05$). However, incumbents performed more sit-ups ($p < 0.001$, ES = 1.7), push-ups ($p < 0.001$, ES = 1.5), and pull-ups ($p < 0.001$, ES = 1.6). Incumbents had faster 1.5 mile run times ($p = 0.015$, ES = -1.0), lower body fat % ($p = 0.018$, ES = -1.0), higher CMJ_{HOH} ($p < 0.001$, ES = 1.7), and higher VO_2max values ($p = 0.01$, ES = 1.13) than recruits. Across testing, incumbent firefighters demonstrated superior body composition, muscular endurance, power, and aerobic fitness, likely attributable to incumbents' job-specific demands and greater levels of training. Recruits may benefit from training programs focused on muscular power and cardiovascular fitness before joining the academy to maximize job-specific training and performance. This abstract was made possible in part by Grant Number T32-GM081740 from NIH-NIGMS, awarded to GFM.

TP407: COMPARISON OF ACCELEROMETER PLACEMENT ON PHYSICAL ACTIVITY AND SLEEP IN FEMALE ARMY ROTC CADETS

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BACKGROUND: Accelerometry is often utilized to assess physical activity and sleep under free-living conditions, with common sites of placement on the wrist or hip. However, it is unclear how comparable data from these sites are in female US Army Reserve Officers' Training Corps (ROTC) cadets, as no data currently exists in this population. Therefore, the purpose of the present study was to compare wrist- and hip-worn accelerometer placement on physical activity and sleep in female Army ROTC cadets. **METHODS:** Following an overnight fast, anthropometrics and body composition were measured. Participants were equipped with both wrist- and hip-worn ActiGraph wGT3X-BT triaxial accelerometers which were worn on their non-dominant side for seven continuous days. To examine physical activity, exercise energy expenditure (EEE) and time spent in moderate-to-vigorous physical activity (MVPA) were evaluated. Sleep was assessed by examining the total time in bed (TIB), total sleep time (TST), wake after sleep onset (WASO), awakenings, and sleep efficiency. Accelerometer data was processed and scored using ActiLife v6.14 software. Data were analyzed using paired samples t-tests. **RESULTS:** 10 female US Army ROTC cadets (22 ± 4 years, 166.0 ± 6.1 cm, 67.1 ± 9.1 kg, 26.1 ± 6.2 % body fat, 49.2 ± 4.8 kg fat-free mass) completed the study. Mean EEE was greater from the wrist compared to the hip-worn accelerometer (1477 ± 584 vs. 482 ± 110 kcal, respectively; $p < 0.001$). Similarly, MVPA was higher from the wrist-worn accelerometer compared to the hip (275 ± 91 vs. 57 ± 17 min, respectively; $p < 0.001$). TIB (398 ± 103 vs 459 ± 93 min; $p < 0.001$), TST (373 ± 100 vs 447 ± 91 min; $p < 0.001$), and sleep efficiency (93.3 ± 2.6 vs 97.3 ± 1.7 %; $p = 0.002$) were all lower while WASO was greater (25 ± 10 vs 12 ± 8 min; $p = 0.004$) with wrist compared to hip placement, respectively. **CONCLUSIONS:** These data indicate that the anatomical placement of triaxial accelerometers is an important consideration in female Army ROTC cadets as physical activity and sleep outputs from wrist- and hip-worn accelerometers are not interchangeable. **ACKNOWLEDGMENTS**: This research was funded by the USC Upstate Office of Sponsored Awards and Research Support.

TP408: A RETROSPECTIVE DESCRIPTIVE ANALYSIS OF MUSCULOSKELETAL INJURY INCIDENCE AND INCURRED FINANCIAL COST IN CAREER FIREFIGHTERS

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BACKGROUND: Firefighting is a physically demanding profession, leading to a high risk of injury. In 2022, the National Fire Protection Association (NFPA) reported over 65,000 line-of-duty injuries, with musculoskeletal injuries (MSIs) being the most common. This study describes the incurred cost, cause, location, and body region of MSIs among career firefighters. METHODS: Retrospective worker's compensation claims were collected from 4 career fire departments across the United States for the 2022 fiscal year. MSIs were evaluated based on incurred cost, sex, cause of injury, location of injury (on-call, training, and station), and body region. Normalized values were calculated for injury costs per person years (represented as firefighter years [FFyr]). RESULTS: A total of 637 injuries were reported, 422 (66.2%) of which were MSI. The total incurred cost was $6.34 million USD with $4.75 million USD ($2,946.92/FFyr) associated with MSIs. Two of the 4 departments reported MSIs in female firefighters for a total of 34 claims (8.1% of all MSIs), incurring costs of $272,179.71 (5.7% of total MSI cost). The most prevalent causes of MSIs included Lifting (69 reported, 16.4%), Slip, Trip, or Fall (44 reported, 10.4%), and Pushing or Pulling (39 reported, 9.2%). Of all reported MSIs, 225 (53.3%) occurred on call, 112 (26.5%) during training, and 32 (7.6%) at the station. The most prevalent body regions for on-call and training injuries included shoulder, low back, and knee. The most prevalent body regions for station injuries included low back, knee, and ankle. CONCLUSIONS: These results indicate that MSIs produce a substantial financial burden in direct costs. Furthermore, these findings provide insight for implementation of MSI prevention programs and can inform training protocols to reduce high-risk movement patterns. Limited injury etiology exists within the fire service; these data are crucial in understanding the common mechanisms of MSIs to reduce injury risk and financial cost, while improving the health and well-being of career firefighters.

TP501: FEEL THE BEAT, CONNECT THE ENERGY, UNDERSTAND THE CULTURE, HEAL THE HEART

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BACKGROUND: Cardiovascular disease (CVD) is the leading cause of death worldwide, with African Americans (AA) at higher risk due to systemic racism and related stressors, resulting in poorer health outcomes. This pilot study aimed to explore how West African dance (WAD) could improve cardiovascular health, physical fitness, and psychosocial well-being in AA women. METHODS: Thirteen AA women (age: 19.6±1yr) were randomly assigned to either an intervention group, which participated in WAD classes, or a comparison group, which attended educational sessions. Both groups had 11 visits: 8 regular visits and 3 testing sessions (pre, during, and post). Testing included heart rate (HR), systolic (SBP) and diastolic (DBP) blood pressure, physical fitness (plank, wall sit, and crunch test), perceived stress questionnaire, the interpersonal support evaluation list, and a visual analog scale (depression, calmness, autopilot). The intervention group participated in eight 90-min WAD sessions, learning warm-ups and dance steps from the Kuku rhythm. The comparison group engaged in eight 90-min educational sessions on West African culture, CVD, and health practices, followed by a self-care activity and group discussions. All testing occurred between 6-9pm. RESULTS: There were no group x time interactions for SBP, DBP and HR. There were significant time effects for SBP ($p = 0.06$) and DBP ($p = 0.04$), with SBP being greater (+8.1±2.3 mmhg and +6.3±2.5 mmhg) after the 4 weeks compared to both 2 week and baseline SBP, respectively. Similarly, DBP was 4.4±1.5 mmhg and 6.9±2.3 mmhg greater at 4 weeks than at 2 weeks and baseline. There were no significant group x time interactions or time effects for all the physical fitness and psychosocial well-being measures. CONCLUSION: Our preliminary findings suggest that longer interventions combining physical activity

and psychosocial support may be necessary to improve cardiovascular health, physical fitness, and well-being in the AA population.

TP502: FEASIBILITY AND EFFECTIVENESS OF A DANCE PROGRAM FOR PEOPLE WITH DOWN SYNDROME USING SELF-DETERMINATION THEORY

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BACKGROUND: Facilitators of physical activity (PA) in individuals with Down syndrome (DS) include freedom of choice, skill development, and social interaction. These factors align with autonomy, competence, and relatedness that, according to Self-determination Theory (SDT), promote motivated behavior. A dance program based on SDT may thus be feasible and effective in adults with DS. **PURPOSE:** To assess the feasibility and effectiveness of a dance program based on SDT in adults with DS. **METHODS:** Eight adults with DS (2 men; age 31 ± 12 years) participated in an 8-week dance program (two sessions/week; 60 min/session) that systematically promoted relatedness, competence, and autonomy. Two dance styles were used - 4 weeks of hip hop and 4 weeks of jazz. The intensity of the dance gradually increased based on each participant's percent heart rate reserve (weeks 1-2: 50-60%; weeks 3-5: 55-70%; weeks 6-8: 65-80%). Heart rate was continuously monitored with a Polar monitor. We derived feasibility data: resources, attendance, cost, time requirements. Before and after the program, we measured physical performance with the 6 Minute Walk Test (6MWT) and the Short Physical Performance Battery (SPPB) which included balance, gait speed, and chair stand tests. Autonomy, competence, relatedness, autonomy support, autonomous motivation, and friend support were also measured. We tested changes in pre- and post-intervention measures with Wilcoxon signed-rank tests and calculated effect sizes (ES). **RESULTS:** Mean attendance for the 16 sessions was 68.8 ± 21.9%. Attendance was ≥75% for 12 out of 16 sessions. Total cost of the program was $2,877. Total time spent was 71 hours. External regulation significantly decreased and had a large effect size (p = .035; ES: -0.53). Non-significant differences (p>0.05), but with medium effect sizes were observed in total SPPB (ES: -0.40), balance (ES: -0.46), chair stand (ES: -0.35), autonomy (ES: -0.41), autonomous motivation (ES: -0.37), and autonomy support scores (ES: -0.40). Non-significant changes with small effect sizes were found for gait speed, 6MWT, competence, and friend support scores (p>0.05; ES: -0.20 to -0.28). **CONCLUSIONS:** A dance program based on SDT is feasible in adults with DS and can decrease external regulation, indicating a shift towards more self-determined motivation.

TP503: THE EFFECT TO MUSIC VOLUME ON FINE MOTOR SKILLS IN COLLEGE AGED ADULTS

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Music and music tempo can affect fine motor skill task performance. Evidence has shown that fast tempo music has decreased fine motor skills while slow tempo increases precision of fine motor skills. Music volume may increase agility, motivation, arousal and mental effort. The purpose of this study was to determine if listening to music at different volumes affects accuracy of two fine motor tasks. Methods: College aged male and female participants provided informed consent and participated in this study. Participants visited the laboratory for a single visit where they completed two tasks (dart throwing and domino stacking) under three conditions (loud, soft and no music). The order of the trials was counterbalanced. Participants selected their own preferred single song between at a tempo of 105-120 BPM. The song was played through an external speaker and played at a volume of ~85db (loud) or ~60db (soft) during the task. Dart throwing was performed using a started 18-inch sisal fiber dartboard with a 1-20 clock pattern placed at 2.37m from the participant and a height of 1.73m. Darts were standard steel tipped weighing ~.65oz. Participants attempted 15 throws under each condition and throws were scored by distance from the center of the dart board. Domino stacking required participant to use 25 dominoes to form a tower during a three-minute period under each condition. Stacking was scored by the number of dominoes placed. A repeated measures ANOVA was used to compare fine motor skill performance when listening to soft, loud and no music. No significant differences were found in dart throwing (p=0.30) or domino stacking (p=0.65) performance under any music condition. These data suggest that music does not influence fine motor skills in a college aged population.

TP505: EFFECT OF YOGA ON HEART RATE VARIABILITY IN COLLEGE ATHLETES

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BACKGROUND: Heart rate variability (HRV) is the variation in time between heartbeats, showing autonomic function. Stress has been proven to cause muscle tension, increased fatigue, and impair both timing and coordination predisposing to injury. Yoga has been found to reduce the Sympathetic Nervous System and increase the Parasympathetic Nervous System, resulting in improved recovery. The purpose of this study was to determine if performing yoga three days a week would decrease perceived stress and improve HRV.
METHODS: Eight collegiate athletes were randomly assigned into either a yoga group or a control group. The yoga group completed a 15 minute yoga session, twice a week for six weeks. The control group continued normal training for six weeks. HRV was collected using Polar straps and the Elite HRV app at baseline, three weeks, and six weeks.
RESULTS: No significant differences between groups were found at baseline. Regardless of group, there was a significant decrease in HRV from week three to week six (74.1 to 71.6, p = 0.046). From baseline to the midpoint, the yoga group had a decreased HRV, while the control group's increased (74.8 to 71.5, p = 0.044 and 72.0 to 76.8, p = 0.010; respectively). From baseline to post-intervention, the yoga group had a decreased HRV, while the control group's had no significant difference (74.8 to 69.3, p = 0.006 and 72.0 to 74.0, p = 0.186; respectively). **CONCLUSIONS:** Our study found that adding yoga on top of normal training worsened HRV response. This may be due to the type of yoga that was completed. Future research should compare types of yoga to see what their effect on HRV is.

TP506: EFFECT OF PLAYING ATHLETE MUSIC PREFERENCE ON EXERCISE PERFORMANCE

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BACKGROUND: Music is a commonplace tool to shift the environment of athletes and help them better enjoy their exercise sessions. Previous research has shown that music can alter athlete's perceptions and physiologic responses to exercise. Despite this, it remains unclear whether athlete's music preference matters, rather than just factors such as tempo, noise level, or when compared to no music. The purpose of this study was to determine whether music preference affects muscular endurance in athletes performing a resistance training workout. **METHODS:** Six collegiate athletes were recruited for this study. Participants completed two identical resistance training sessions with exercises done to failure one week apart. In each session, they either listened to preferred or non-preferred music. Preferred music was determined by asking participants to make their own playlists. Total rep counts were recorded to determine whether music choice affected the athlete's performance. A paired samples t-test was used to determine differences between the two trials. **RESULTS:** Athletes listening to their preferred music completed more reps before failure than when listening to nonpreferred music (18.4 ± 3.5 vs 14.5 ± 4.5, p = 0.004). **CONCLUSION:** Music change to an athletes preferred music and tempo significantly altered their performance. This suggests a role in individuality of music preference when determining which music is best for an athlete to listen to during exercise. Strength and conditioning coaches should consider athlete preference when making weight room playlists.

TP507: EXAMINING THE EFFECTS OF MUSIC ON MULTIPLE MEASURES OF EXERCISE PERFORMANCE

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BACKGROUND: The use of music to motivate exercise performance is common in sport and exercise. Most research has investigated the influence of music on cardiorespiratory exercises. The influence of music on anaerobic agility exercises, power movements, and muscular endurance have been far less investigated. The influence of music is also of interest for individuals needing to control external environments when performing max performance testing. Thus, the purpose of this study was to investigate if high tempo background music affected performance on upper and lower extremity max effort tests. METHODS: 17 recreational active individuals between 18-25 years old completed the study. Two data collections occurred one week

apart on the same day of the week and time of day. One was conducted with no music and one included high-tempo, mixed-genre background music based on Brunel Music Rating Inventory 2 suggestions, with all songs having at least 120bpm. Investigators did not mention the music, the study purpose was not disclosed to participants, and the session condition order was counterbalanced. Each session included three max effort trials of countermovement vertical jump, 20-yard shuttle drill, grip strength per hand, and 15-second maximum push-up test. A visual analog mood scale (VAMS) to rate how happy, excited, and tired they were was completed prior to and following each session. Paired samples t-tests determined differences in max jump height (in), fastest shuttle time (s), max strength (kg), and average push-ups completed either modified or standard between music and non-music sessions. Repeated measures ANOVAs were used to assess main effects for time and condition for each VAMS. Significance was set a priori at $p \leq .05$. RESULTS: No significant differences were observed between conditions for any performance measures ($p > .05$). There was a significant increase in happy VAMS ($p = .018$) and excited VAMS ($p = .002$) from pre to post testing for both conditions. CONCLUSION: The results suggest that high-tempo background music may not affect performance on certain upper and lower extremity max exercise tests. The lack of influence could be beneficial when the control of background music during testing is variable or not possible. This is further supported with the observed increase in mood post testing for both conditions.

TP508: EXPLORING PHYSICAL FITNESS FOR MUSICIANS

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Background: Musicians are susceptible muscular fatigue, resulting from prolonged body tension to maintain standing or sitting posture when playing an instrument or singing. This can lead to injury resulting in lost practice/performance time. This pilot study surveyed professional musicians on their exercise habits and perceptions, and injury prevalence.
Methods: A group of musicians was surveyed regarding their current exercise habits and perceived benefits in practice and performance. Respondents completed a non-identifying survey, allowing for quantitative and qualitative responses describing exercise habits, perception of exercise for musicians, performance, and injury history.
Results: 67 adults completed the survey, all of whom identified themselves as professional musicians (57), music instructors (6), and graduate or undergraduate music majors or minors (4). Respondents identified themselves as 37 singers, 22 instrumentalists and 8 miscellaneous music-related careers. 82% felt physical fitness was important. 68% walk as part of their overall fitness routine. Running and Cycling were also common activities, at 26% and 22%, respectively. 22% of respondents indicated they currently do no strength training at all. Of those who do participate in some type of strength training, 40% participate in some type of traditional or body weight training, or Olympic weightlifting. 58% (39) of respondents indicated that they'd experienced one or more performance-related injuries or have had a non-performance-related injury that resulted in lost practice/perform time, ranging from 1 week to more than six months. 31% of those 39 respondents indicated that they'd suffered one or more neck, back, and/or shoulder-related injuries. Instrumentalists reported arm, wrist and finger injuries, and vocalist and brass respondents indicated that they'd suffered muscle tension dysphonia and embouchure injuries.**Conclusions:** The majority of respondents participated in some mode of physical fitness. However, due to the muscular endurance to maintain postural integrity and use of instrument specific movement patterns, more emphasis on muscular endurance-based weight training combined with mobility exercise, may be of benefit.

Poster Presentation Sessions

P101: OFF-DUTY SLEEP PATTERNS AMONG STRUCTURAL FIREFIGHTERS

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BACKGROUND: The World Health Organization recommends that adults accumulate 7-9 hours of sleep to promote and restore health outcomes. The majority of research in the fire service indicates that firefighters do not obtain adequate amounts of sleep on-duty. However, there is limited research focused on off-duty sleep patterns. Describing off-duty sleep patterns may provide insight regarding the utilization of appropriate countermeasures. Therefore, the purpose of this study was to describe firefighters' off-duty sleep patterns and identify sleep barriers. METHODS: A cohort of firefighters (N=119; Male: 91%, Age: 37 [13]yr; Experience: 12[14] yr) within a career fire department utilizing a 24 hr on-duty, 48 hr off-duty schedule were recruited to complete an online survey inquiring about off-duty daytime and nighttime sleep patterns. Basic statistics, including proportional responses and median [interquartile range] values, were used to describe outcome variables. Military time (Hour: Min) was used to describe time units. Firefighters reporting a sleep disorder were excluded from the analysis. RESULTS: 50% of firefighters reported less than 7 hours of sleep on the most recent off-duty night, with a median of 7.0 [2.0] hours of sleep. 73% of firefighters indicated that there were obstacles to obtaining adequate sleep off-duty, highlighted by the need to care for young children (48%). Firefighters woke for work at 05:10 [04:40-05:30] for a 07:00 shift start time. 63% indicated that delaying the shift start time would not facilitate more accumulated sleep prior to starting the shift, primarily because of morning childcare responsibilities, their partner preparing for work, commuting against traffic patterns, and being accustomed to the current shift start time. 32% of firefighters took a daytime nap on the most recent off-duty day with a 60[70] min duration. Of these firefighters, there was no difference in the pattern of daytime sleep duration across consecutive off-duty days ($p \geq 0.311$). 29% of firefighters indicated that nighttime sleep duration was similar across off-duty days, whereas 32% reported increased sleep duration. CONCLUSIONS: These findings indicate that many firefighters are not obtaining adequate amounts of sleep and identified several critical barriers to increasing off-duty sleep duration.

P102: THE EFFECTS OF A CARBOHYDRATE AND SODIUM SUPPLEMENT ON BRAZILAIN JIU-JITSU PERFORMANCE

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BACKGROUND: Brazilian Jiu Jitsu (BJJ) is a grappling-based combat sport, where the objective is to submit your opponent. Current research shows that the sport's short duration, high intensity bouts, lead to a high glycolytic and perspiration rate. The literature body lacks nutrition research and needs to elucidate guidance for BJJ players. Current sports performance literature shows a consensus of the ergogenic effects of carbohydrate (CHO) and sodium (Na) supplementation. This study aims to explore the potential ergogenic effects of a CHO+Na supplement in BJJ players. METHODS: We aim to recruit male participants (n=20) who are active BJJ players. An a-priori power analysis was completed using G*Power to determine minimum sample size required. Results indicated the aforementioned sample size to achieve 80% power to detect a medium effect at a significance level of $\alpha=0.05$. We will use a randomized placebo-controlled repeated measures design, block randomizing participants into three conditions (Low Dose CHO+Na, High Dose CHO+Na, Placebo). Participants will engage in simulated competition training rounds designed to increase intensity similar to competition. During the testing periods participants will be outfitted with a heart rate (HR) monitor (Polar H10; Polar Electro, Kempele, Finland). Participants will be asked to complete a series of inventories relating to rating of perceived exertion (RPE), thirst, and fatigue at multiple timepoints during the testing day (pre-, during, immediately post). Participants will weigh in pre- and post-training to monitor sweat loss. Sweat sodium concentration (SSC) will be collected and analyzed via sweat collection patches (Nix Hydration Biosensor) and all fluid consumed will be controlled. Participants will have blood glucose and lactate concentrations measured pre- and post-testing via capillary blood test. Data will be analyzed using repeated measures analysis of variance (ANOVA) to determine significant differences, if any. ANTICIPATED RESULTS: We hypothesize that the consumption of a CHO+Na supplement will increase blood glucose, lactate, HR, SSC, and sweat loss, with a decrease in RPE, fatigue, and thirst ratings.

P103: A SYSTEMATIC REVIEW OF BRAZILIAN JIU-JITSU RESEARCH: ADDRESSING THE GAP IN SPORT SPECIFIC NUTRITION

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BACKGROUND: Brazilian Jiu-Jitsu (BJJ) is a grappling based combat sport with a unique mix of vigorous and moderate activity. BJJ has high anaerobic demand with a need for sustained performance. OBJECTIVES: This review aims to analyze the current body of literature regarding BJJ and identify sport-specific nutritional requirements. METHODS: A review of the relevant literature was completed, following the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) design. Two reviewers (ZD and CM) decided on eligibility, in the case of disagreement a third-party reviewer (PH) decided. Search terms used were "Brazilian Jiu-Jitsu, Jiu-Jitsu, BJJ, and Submission Grappling." After initial identification, articles were screened for compliance. Exclusion criteria were: non-human model, non-Random Control Trial (RCT)/experimental design, non-BJJ players, and non-peer reviewed. After review for primary exclusion, both reviewers did a full text review of the articles and decided on inclusion. DATA SOURCES: All articles were obtained from a comprehensive search of two databases, PubMed and SportDiscus. Searches were performed between 2/24 and 3/24. RESULTS: After an initial search, 194 articles were identifiedfor primary review. 66 were excluded. 49 (25.1% of the total)were excluded due to non-RCT/experimental design. 15 (7.7% of the total) were excluded due to non-BJJ populations, and 2(1% of the total) were excluded due to being non-peer reviewed.Of the remaining 128, only 11 or 8.6% focused on sport-specific nutrition or supplementation. The supplements studied were caffeine, carbohydrates, beetroot-gel, sodium bicarbonate, arginine, and capsaicin. Of the 11, six (54.5%) used non-combat measures, two (18.2%) used a mix of both non-combat and combat measures, and only one (9%) used strictly combat measures. The remaining two (18.2%) examined dietary patterns of BJJ players. CONCLUSION: Through a complete qualitative systematic review following PRISMA guidelines, our group found a large discontinuity in the literature regarding nutrition and supplementation for combat or competition-based BJJ performance. The lack of studies examining nutrition using combat measures warrants further research into optimal performance for BJJ players.

P104: ORDERED EATING AND ITS EFFECTS ON BLOOD GLUCOSE AND SUBSTRATE UTILIZATION WITH STEADY-STATE EXERCISE

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PURPOSE: The order of macronutrient consumption in a meal sequence has been shown to impact postprandial (PP) glucose in acute interventions—similar to altering glycemic index of a meal. Additionally, glycemic index of pre-exercise meals affects substrate utilization during steady-state exercise bouts. The present study evaluated the impact of altering the order of a meal's macronutrient consumption prior to steady-state exercise. METHODS: Participants (n=18; 8 male, 10 female) were fasted for at least 8 hours and randomized to either a rice-first (RF) or rice-last (RL) condition for one visit and the opposite for a second visit. Participants were offered a meal of 150 g rice, 150 g broccoli, and 100 g chicken where chicken and broccoli were consumed together. Participants consumed meal components during 2 back-to-back 7.5-min phases. Post-consumption, they rested for 60 min before beginning a 30-min running bout at 70% age-predicted max heart rate. After exercise, participants rested for 30 min. Blood glucose (BG) was measured regularly, and respiratory exchange data was taken throughout the PP phase excluding the post-exercise portion. RESULTS: Age, height, mass, and percent body fat were 37.1±10.3 y; 170.3±10.7 cm; 73.0±15.9 kg; and 22.6±7.2%, respectively. There was a condition * time interaction for BG, with higher levels for RF than RL 30 min after eating (133±20 vs. 106±21; p<.001). BG decreased more from the start to end of exercise in RF (-21±22 mg/dL), t=-2.3, p=.035, than in RL (-5±24 mg/dL). Among n=15 with gas exchange data, there was a significant condition effect on carbohydrate oxidation during PP rest, F((1,14)=5.5, p=.034), a significant time effect, F(9,126=17.1, p=< .001, and a significant condition * time interaction, F((9,126)=3.4, p=.024). During exercise, there was a significant condition effect on carbohydrate oxidation, F(1,14)=5.0, p=.043, and a significant time effect, F(5,70)=17.9, p<.001. CONCLUSION: The present study replicated the results of prior research in that meal sequence impacts PP BG. Further, we demonstrated that a RL meal order reduces carbohydrate oxidation and increases fat oxidation at rest and during moderate-intensity exercise carried out one hour after eating.

P105: MOMENT TO MOMENTARY CHANGE IN RER COUPLED TO CHANGE IN POSTURE

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BACKGROUND: In lab for instruction to show a change in O2 use from sitting to walking, we noticed that across multiple trials RER ($VCO2 \bullet VO2^{-1}$) *decreased* as the participants moved from sitting to walking in the first 2.5 minutes (m). This is opposite of conventional wisdom (CW), teaching, and research in exercise science. The decrease, we hypothesized, could be due to either the enhanced metabolism of walking or the change in posture. The purpose of this study was to isolate the effect of posture change. METHODS: A sample of 10 subjects (3F, 7M, 23.7±4 y) rested in a seated position on a standard message table for 25 m to establish steady state. After being fitted for heart rate (bpm, Polar ®) and gas collection/analyses using Parvomedics TrueOne 2400 ® met cart, participants did one of 6 possible posture patterns of laying supine (Su) to sitting (Si) to standing (St), counterbalanced in order across participants - 7 m in each posture. From this, we captured and analyzed 28 unique posture changes - 14 moving upright (UP) and 14 moving down (DOWN). RESULTS: UP (Su to Si, Su to St, or Su to St) enhanced RER and DOWN (St to Si, St to Su, or St to Su) reduced RER compared to the prior position. Focused contrasts at time points 60 seconds (s), 90 s, 120 s, and 150 s were statistically significantly different, $p < .009$ between UP and DOWN. Peak RER difference was witnessed at 90 s (UP RER = 0.930, DOWN RER = 0.763). CONCLUSIONS: Posture change reliably alters RER such that moving UP enhances RER compared to DOWN from time 60 s to 150 s. If there is a true decrease in RER as anecdotally witnessed in our lab, then it must be due to exertion - not posture change. Our next study will chart the changes in RER as one moves from a rested seated position to walking at a mild pace.

P106: THE INFLUENCE OF 16-WEEK MINIMAL EXERCISE ROUTINE ON METABOLISM IN TYPE-2 DIABETICS

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Background: Diabetes is a growing concern both nationally and globally. There are many exercise interventions that seek to treat this condition, but present burdensome time commitment requirements and most exercise programs lack appeal and result in poor compliance. Therefore, the purpose of this study was to determine the effectiveness of a 16-week intervention of a minimal dose high-intensity bodyweight circuit (HIBC) program on markers of metabolic function in persons with type 2 diabetes (T2DM). Methods: 17 Participants between the ages of 40-65 diagnosed with T2DM were recruited for this study. Prior to the intervention, participants underwent assessments of glycosylated hemoglobin (HbA1c) and fasting plasma glucose (FG), oral glucose tolerance test area under the curve (AUC) and lipids. Metabolic markers were collected via finger stick. Participants completed 16-weeks of bodyweight circuit training (10 bodyweight squats, 5 modified pull-ups, 5 modified push-ups, 10 abdominal crunches). Participants completed as many cycles as possible in each session. Session duration progressed from 5-10 minutes, and session frequency progressed from 3-4 sessions per week, as tolerated. All assessments were repeated after 16 weeks of training. Results: A total of 7 participants completed the study: Female (n = 2) (54 +/- 5.6yr) Male (n=5) (53 +/- 1.5 yr). A paired samples t-test showed an increase in glucose AUC: (p = 0.027), a trend towards decreased HbA1c: (p = .09) and a trend towards increased FBG: (p = .088), while no changes were indicated in tTotal cholesterol (p = .229), HDL: (p = .264), LDL: (p = .232), triglycerides: (p = .210), or TC/HDL ratio: (p = .244). Conclusion: The HIBC demonstrated trending reductions in A1c following the intervention, while not appearing to be effective in improving the other markers of metabolic function in participants. Interestingly, FBG and AUC showed negative affects pre and post, but may be the result of acute variations in glucose regulation, which have been observed in our lab before. HIBC may be a beneficial intervention for those seeking to reduce A1c.

P107: PHYSICAL ACTIVITY AND SEDENTARY BEHAVIOR PATTERNS AMONG OLDER ADULTS WITH REGULAR PICKLEBALL PARTICIPATION: A PILOT STUDY

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Background: Adequate physical activity (PA) and minimizing sedentary behavior (SB) are vital for healthy aging. Pickleball (PB) is a fast-growing sport in the U.S. that is a promising activity for older adults. This study investigated the impact of regular PB participation on PA and SB profiles in older adults. **Methods:** Thirteen males (age 68.07 ± 6.22 years) and fifteen females (age 71.09 ± 7.99 years) who partook in regular PB participated in this study. GT3x+ accelerometers were used to collect PA and SB data. Daily counts per minute (CPM), light, moderate, vigorous PA (LPA, MPA, VPA), moderate-to-vigorous PA (MVPA), and steps were collected as variables for PA indicators. Total sedentary time, numbers and times of at least 10 and 30 minutes of sedentary bouts were analyzed for SB outcomes. Two-way [2 (male vs. female) x 2 (PB day vs. non-PB day)] ANCOVAs controlled for age were used to examine differences in outcome variables between factors. Pairwise comparisons were adopted to interpret simple main effects. Significant levels were set at α = 0.5. **Results:** Daily CPM was found significantly higher on PB days in males and females (867.99±61.31 vs. 498.19±58 and 897.50±56.98 vs. 683.19±54.48, respectively, $p < .001$). No significant differences in LPA among sexes and PB/non-PB days were observed. Significantly lower total sedentary time was found on PB days in males and females (204.44±38.95 vs. 526.28±22.06 and 106.73±36.19 vs. 434.09±20.51, respectively, $p < .001$), while males had significantly higher sedentary time on non-PB days than females (526.28±22.06 vs 434.09 ± 20.51, $p < .05$). **Conclusion:** PB may effectively increase daily PA levels and reduce sedentary time in older adults. **I**ncorporating PB may be beneficial for older adults to maintain a consistently active lifestyle.

P108: INVESTIGATING THE ROLE OF WALKABILITY IN SELF-REPORTED CANCER DIAGNOSIS AMONG U.S. ADULTS 18 AND OLDER

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Purpose: Cancer is the second leading cause of death in the United States, disproportionately affecting underserved communities. Socio-environmental factors, such as neighborhood walkability and socioeconomic status, contribute to disparities in cancer outcomes, particularly among underserved populations. Neighborhood characteristics like safety, access to resources, and walkability play a role in shaping health outcomes. This study aimed to investigate the role of walkability in self-reported cancer diagnoses among adults 18 years and older in the United States, emphasizing the critical role of the built environment in cancer risk. **Methods**: Data from the 2020 National Health Interview Survey and its Cancer Control Supplement was used to assess neighborhood walkability factors linked to cancer diagnoses. The dependent variable was self-reported cancer diagnosis, while independent variables measured neighborhood walkability, including access to transit, recreational spaces, and sidewalks. Control variables included sociodemographic factors and region of residence. Bivariate analysis and multivariable logistic regression were conducted to estimate odds ratios for walkability factors associated with self-reported cancer diagnoses using SAS 9.4. **Results**: Of 1,286 respondents, 1,140 (89%) reported a history of cancer diagnosis. The majority of those who had a self-diagnosis of cancer were female (96%), Hispanic (29%), lived in the Southern U.S. (68%), did not have access to transit (72%), fun places to walk to (59%), or sidewalks (59%). After adjusting for confounders, no significant associations were found between walkability factors and self-reported cancer diagnosis. **Conclusion**: Although the current results do not align with established literature showing an association between walkability and health outcomes, further research could help explore additional factors related to the built environment that may influence modifiable cancer risk factors and outcomes. Ultimately, this could inform the identification of actionable community-level interventions to reduce cancer burden and disparities.

P109: ASSESSING PHYSICAL ACTIVITY LEVELS IN ADVANCED PROSTATE CANCER SURVIVORS: COMPARING NON-GRAVITATIONAL AND GRAVITATIONAL CUT-POINTS

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BACKGROUND: The literature on physical activity (PA) in advanced prostate cancer (PC) is mixed and methodologically heterogeneous, with much of it using non-gravitational cut points (e.g., average counts per minute; cpm). However, these cut points are influenced by study-specific factors such as sampling rate and epoch length, reducing comparability across studies. Therefore, using gravitational cut-points, unaffected by these limitations, is necessary. The aim of the study is to compare non-gravitational and gravitational units when assessing PA levels in advanced PC survivors. **METHODS**: Advanced PC survivors (N=24, mean age=73.3±7.7 years) wore an ActiGraph GT3X+on their non-dominant wrist for five days. Data were processed using Freedson (1998) (ActiLife; non-gravitational units; cpm), and Hildebrand (2014) cut points (GGIR; gravitational units; mg) and compared using Wilcoxon signed-rank (W) and interclass correlation coefficients (ICC) analysis. **RESULTS:** There were differences across the non-gravitational and gravitational cut points methods for all activity levels: inactivity (MD = −117min, p <0.001), light PA (MD = 421min, p < 0.001), moderate PA (MD = 8.47min, p = 0.003) and vigorous PA (MD = −0.617min, p<0.001). Agreement was poor for inactivity (ICC = 0.193, 95% CI [-0.026, 0.404]), light PA (ICC = 0.013, 95% CI [-0.012, 0.055]), and vigorous PA (ICC = 0.116, 95% CI [-0.136, 0.354]), but high for moderate PA (ICC = 0.845, 95% CI [0.728, 0.910]). **CONCLUSIONS:** The two methods showed high agreement for moderate PA based on ICC, but discrepancies and poor agreement were found for other intensities. Gravitational cut points appear advantageous, as they are unaffected by sampling rate and epoch length, enhancing comparability across studies. Future research in PC survivors may choose to focus on non-cut-point metrics such as Euclidean Norm Minus One (ENMO) and Intensity Gradient (IG), as these are not populations specific.

P110: PERCEIVED EXERTION AND MET-DEFINED INTENSITY DURING TREADMILL EXERCISE IN COLLEGE-AGE ADULTS

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Title: PERCEIVED EXERTION AND MET-DEFINED INTENSITY DURING TREADMILL EXERCISE IN COLLEGE-AGE ADULTS
Institution: University of North Carolina at Charlotte **BACKGROUND:** The Borg scale (6-20) captures individuals' rating of perceived exertion (RPE) during exercise, while the oxygen cost (intensity) of exercise is measured using indirect calorimetry as multiples of metabolic equivalents (METs: 1 MET = 3.5ml/kg/min). This study explores the relationship between RPE and METs during walking/running in college-age adults 18-20 years of age. **METHODS:** Seventy-two participants (mean age = 19.0, SD 0.8 years; mean BMI = 23.92, SD 4.71; 51.38% female) performed incremental treadmill exercise (0.5mph - 6.0mph), with oxygen uptake (VO_2) measured by indirect calorimetry. MET values were calculated per 5-minute bout. Borg RPE was solicited during the final 30 seconds of each bout. A linear mixed effects model with a spline component and both random intercepts and slopes for participants was used to estimate the association between RPE and MET, and a 95% confidence interval was computed. **RESULTS:** Descriptive statistics show a mean RPE of 10.26 (SD 2.84) and mean MET of 5.69 (SD 3.02), with participants completing a mean of 9.33 bouts (SD 2.30), contributing to a total of 672 bouts across all 72 participants. There was a significant nonlinear relationship between RPE and METs (p<0.0001). MET values increased with higher RPE. For example, at RPE=6, the expected MET was 1.86 (95% CI: 1.39, 2.34), and at RPE=17, it was 13.90 (95% CI:12.60, 15.20). **CONCLUSIONS:** The Borg RPE scale is associated with oxygen cost across walking/running in college-age adults. While this study provides a 95% confidence interval for the mean MET levels associated with specific RPE values, further research is needed to confirm these findings in other populations. **Grant or funding information:** NIH NICHD - R01HD105768

P111: ASSOCIATION OF BODY FAT AND BMI WITH PERCEIVED EXERTION DURING EXERCISE IN 18-20-YEAR-OLDS

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BACKGROUND: Anthropometric factors, such as body fat percentage (BF%) and body mass index (BMI), may be associated with exercise performance and perceived effort, potentially affecting individualized exercise prescriptions. BF% is a measure of body fat relative to lean mass, while BMI (kg/m2) does not distinguish between body fat and lean mass. Rating of perceived exertion (RPE) represents an individual's self-perceived experience of intensity during exercise. This study aimed to investigate associations between BF% and BMI with RPE during aerobic stepping in 18-20-year-olds. METHODS: Seventy-two participants (mean age 19.0, SD 0.81 years; 51.4% female) underwent BF% (Tanita scale) and BMI measurements (standard height and weight protocols). Participants completed a 5-minute aerobic stepping bout guided by a metronome set at 88 beats/min. RPE was assessed using the 6-20 Borg Scale during the final 30 seconds of exercise. Multiple regression analysis was conducted to evaluate the relationship between BF% and BMI with RPE. RESULTS: Mean±SD values for BF%, BMI, and RPE during exercise were 14.3%±7.8%, 24.0±4.7 kg/m2, and 9.9±2.2 for males, and 26.6%±7.6%, 23.9±4.8, and 11.3±2.7 for females, respectively. A significant positive association was observed between BF% and RPE (β=0.118, p=0.007), indicating that higher BF% was associated with increased perceived exertion. BMI did not show a statistically significant relationship with RPE (β=-0.058, p=0.503). Overall, the model explained approximately 14.5% of the variance in RPE (R^2= 0.145). CONCLUSION: BF% had a stronger positive association with perceived exertion compared to BMI. Incorporating BF% into prescription of aerobic exercise intensity may aid in developing more personalized training programs. Future research should explore this relationship further in other populations and in relation to more direct measures of intensity, including oxygen cost of exercise. Grant or Funding Information: NIH NICHD-R01HD105768

P112: CONSERVATION OF PHYSICAL FUNCTION FOR ADULTS WITH ARTHRITIS THROUGH INCREASED SELF-EFFICACY AND WEIGHT-LOSS MAINTENANCE

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Background: Diet and exercise-related weight loss effectively reduces pain and increases both function and self-efficacy in adults with knee osteoarthritis (OA). Although structured weight loss programs have yielded these positive outcomes, the maintenance of weight loss and improvements in physical function long-term have proven to be a challenge. Participants often regain weight without the structure of a regular intervention; not having the self-efficacy to independently implement successful weight loss practices. Therefore, the purpose of this pilot study was to implement a weight loss maintenance intervention (WLM) in participants after the conclusion of the Weight-loss and Exercise for Communities with Arthritis in North Carolina (WE-CAN) study to increase self-efficacy, and consequently maintain physical function and reductions in pain. Methods: Participants who successfully lost at least 5% of their body weight after 18 months in the WE-CAN study were re-randomized into a WLM intervention group or a health education group. Those in WLM received group and individual behavioral sessions grounded in social cognitive theory for maintaining weight loss on their own. The health education control group had 2 in-person group sessions supplemented by newsletters on health and nutrition. Body weight, WOMAC pain and function, six-minute walk distance (6MWD), and self-efficacy were assessed at baseline, 6 months (post-intervention), and 12 and 18 months (no intervention follow-up). Anticipated Results and Implications: It is hypothesized that individuals who receive WLM intervention will report enhanced self-efficacy and maintain weight loss, and as a result sustain both performance-based and self-reported physical function over the 12-month follow-up period as compared to the control group. The promotion of personal agency on both perceived and physiological function would aid in symptom management and act as an effective treatment in adults with OA.

P113: COMPARISON OF PHYSICAL ACTIVITY LEVELS BETWEEN HISPANIC AND NON-HISPANIC CHILDREN WITH AND WITHOUT ADHD

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Background: Hispanic children and those with Attention-Deficit Hyperactivity Disorder (ADHD) often engaged in lees physical activity (PA) than their counterparts. However, limited research has explored the combined effect of Hispanic ethnicity and ADHD on PA levels. This study aims to compare the likelihood of adhering to aerobic PA guidelines among Hispanic and non-Hispanic children, with and without ADHD.**Methods**: This cross-sectional secondary data analysis used data from the 2016-2022 U.S. National Survey of Children's Health. Participants self-reported their ethnicity and ADHD diagnosis. Adherence to PA guidelines was defined as engaging in moderate PA for at least 60 minutes daily for seven days. Binary logistic regression assessed the likelihood of meeting PA guidelines, accounting for Hispanic ethnicity, ADHD diagnosis, and their interaction, while adjusting for demographic factors.**Results:** A total of 176,448 participants were included in the analysis. Among the participants, 76.11% were non-Hispanic children without ADHD, 11.12% were non-Hispanic children with ADHD, 11.42% were Hispanic children without ADHD, and 1.36% were Hispanic children with ADHD. Only 20.80% of the total sample met PA guidelines. The unadjusted logistic regression revealed that children with ADHD (OR=0.85, p<.05; aOR=0.84, p<.05) and Hispanic children (OR=0.77, p<.05; aOR=0.80, p<.05) had a decreased likelihood of meeting the guidelines. A statistically significant interaction between ADHD and Hispanic ethnicity was identified in the unadjusted logistic regression ($p < .05$), but not in the adjusted logistic regression, accounting for demographic factors ($p = .08$).**Conclusion:** Hispanic children and those with ADHD are less likely to meet aerobic PA guidelines. Targeted interventions are needed to address the unique challenges faced by these groups.

P114: INFLUENCE OF DIVERGENT RESISTANCE TRAINING ON ABSOLUTE AND RELATIVE MOTOR UNIT BEHAVIOR AND INPUT EXCITATION

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Purpose: To compare the effects of 16 sessions of combined strength and hypertrophy lowerbody resistance training (SH) to strength focused only training (S) on maximal strength of the knee extensors, muscle cross-sectional area (mCSA) of the vastus lateralis (VL), and motor unit (MU) behavior. Methods: 25 untrained males (age = 24 ± 6 yrs) were randomized into SH (n =12) or S. Participants performed maximal voluntary isometric contractions (MVCs) and 70% MVCs of the knee extensors before (PRE) and after 6 weeks of training at the same absolute pre-training submaximal torque (POSTABS) and relative to post-training MVCs (POSTREL). Surface electromyography (sEMG) was recorded from the VL. VL mCSA was measured via ultrasonography. sEMG signals for the 70% MVCs were decomposed for analysis of MU: recruitment thresholds (RTs), action potential amplitudes (MUAPAMPS), and mean firing rates (MFRs). Y-intercepts (y-ints) and slopes were calculated for the MUAPAMP and MFR vs. RT relationships. Steady torque EMGRMS was normalized (N-EMGRMS) to testing MVCs. A 2-way mixed factorial repeated measures (MFRM) ANOVA (group [SH, S] x time [PRE, POST]) was used for MVC. An independent samples t-test examined mCSA change scores. 2-way MFRMANOVAs (group x time [PRE, POSTABS, POSTREL]) were used for y-ints and slopes from the MUAPAMP and MFR vs. RT relationships, and N-EMGRMS. Results: MVC increased at POST when collapsed across groups ($p < 0.05$). For mCSA, the change scores were greater for SH than S ($p < 0.05$). For SH, slopes from the MUAPAMP vs. RT relationship increased from PRE to POSTABS and POSTREL ($p < 0.05$). For S, the y-ints and slopes from the MFR vs. RT relationships increased and became more negative from PRE to POSTREL ($p < 0.05$), respectively. Moreover, the y-ints and slopes were greater for S than SH at POSTREL ($p < 0.05$). N-EMGRMS for POSTABS was lower than PRE ($p < 0.05$) when collapsed across groups. Conclusion: The similar increase in maximal strength for both groups may have resulted in lower input excitation necessary forPOSTABS 70% MVC.

However, the greater increase in mCSA for SH, may have resulted in recruiting MUs with potentially larger muscle fibers and greater force twitches to match POSTABS and POSTREL torque, whereas, S relied on increased firing rates of the lower threshold MUs relative to RT to match targeted POSTREL 70% torque.

P115: ADIPOSITY DOES NOT INFLUENCE MOTOR UNIT BEHAVIOR DURING SUSTAINED CONTRACTIONS IN SEDENTARY MALES

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BACKGROUND: Increased adiposity resulting in poorer muscle composition may influence motor unit (MU) behavior. The purpose is to examine MU behavior during fatiguing contractions between normal fat (NF) and overfat (OF) males. **METHODS:** Twenty-seven sedentary males were placed in NF (n = 14, age = 21.9 ± 4 y) or OF (age = 25.9 ± 6 y) groups. OF were classified as body fat % (BF%) >24%. Dual-energy X-ray absorptiometry (DXA) measured BF%, leg lean mass (LM), and leg Fat%. Maximal voluntary isometric contractions (MVCs) were performed Pre and Post isometric trapezoidal contractions of the knee extensors at 50% MVC via dynamometer. The plateau was held for 20s. Contractions (rep) were repeated until failure. Surface electromyographic (EMG_{RMS}) signals were recorded from the vastus lateralis (VL) and decomposed for the First and Last completed rep. EMG_{RMS} was normalized (N-EMG_{RMS}) to Pre MVC EMG_{RMS}. Recruitment thresholds (RT), MU action potential amplitudes ($MUAP_{AMP}$), mean firing rates (MFRs), and AP duration (DUR) were calculated for each MU. Linear regression was used to calculate the slopes and y-intercepts (y-int) of the $MUAP_{AMP}$ and MFR vs RT relationships. Independent *t*-tests were used for body composition and # of reps. Repeated measures ANOVAs (2 x 2) were used for MVC and MU variables. **RESULTS:** OF had greater body mass ($p = 0.004$), BF% ($p < 0.001$), leg LM ($p = 0.003$), and leg Fat% ($p < 0.001$) than NF. There was no group difference in # of reps ($p > 0.05$). No ANOVA had an interaction ($p > 0.05$). MVC had a time (Pre > Post; $p < 0.001$) and group (OF > NF; $p = 0.049$) effect. N-EMG_{RMS} had a time (First < Last; $p < 0.001$) but no group effect ($p > 0.05$). MFR vs RT slopes had a time (First < Last; $p = 0.019$) but no group effect ($p > 0.05$). MFR vs RT y-int had no time ($p > 0.05$) nor group ($p > 0.05$) effects. There were no time effects for $MUAP_{AMP}$ vs RT slopes ($p > 0.05$) nor y-int ($p > 0.05$). The larger leg Fat% for OF likely acted as a filter resulting in $MUAP_{AMP}$ vs RT group effects for slope (NF > OF; $p < 0.001$) and y-int (NF < OF; $p = 0.012$) since AP DUR was greater for OF than NF ($p = 0.008$) with no time effect ($p > 0.05$). **CONCLUSION:** Despite adiposity differences, OF and NF had similar neuromuscular responses to fatiguing contractions. To maintain force output, both groups increased the relative excitation to the VL from First to Last leading to greater firing rates of the higher threshold MUs.

P116: COMPARISON OF TWO GAIT SIMULATORS

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BACKGROUND: The study aimed to investigate the efficacy of a constructed force-plate in measuring kinetic data from two cross-training exercise equipment (elliptical and arcuate) with moving platforms. METHODS: Nineteen healthy volunteers (12 women and 7 men, 24± 26.28 y, 172.33±10.54 cm, 69.47±11.94 kg) were randomly selected to exercise on two different days to pedal at 80 rpm per minute of the two machines during EMG and force plate data collection. The force plate was a sandwich design that measured the vertical load, with one forward mounted load cell, measuring horizontal loads. The load cell output and other data were fed into an amplifier and then digitalized. Data were collected on each participant's right leg, after a familiarization session. One force plate was mounted to one step for each machine, RESULTS: The results indicated no significant differences in.the two machines, irrespective of gender (p>0.05). Significant differences in EMG and the force plate data were discovered between the two simulators(p>0.05). However, knee angle, quadricep and velocity forces were not significant, however, and returned mixed results. CONCLUSIONS: The findings suggested researchers may now possibly have the ability to assess joint torques associated with machines where embedded force platforms, in the past, were ineffective measurement tools for these types of measurement.

P117: THE EFFECTS OF FATIGUE ON POSTURAL CONTROL IN HEALTHY POPULATIONS

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BACKGROUND: The sensorimotor system is how the brain processes visual information to adjust a person's position to maintain postural control. It is known that fatigue leads to an increase in fall risk and other motor dysfunction; however, visuomotor changes that occur are unclear. The purpose of this study is to determine the effects of fatigue on postural control of healthy individuals. METHODS: Twenty healthy participants between the ages of 18 to 50 will be recruited. Having any previous history of concussions or major lower-extremity injuries are exclusion criterion because it could interfere with postural control. After signing the informed consent, the participants will be outfitted with a Pedar in-sole and an EEG system. The pre-test will involve three rounds of standing for 30 seconds with their eyes open and 30 seconds with their eyes closed. Following, the participant will be asked to wear an HTC VIVE virtual reality (VR) headset and do three rounds of 30 seconds in the VR still room, 30 seconds in the VR moving room, and 30 seconds in recovery after the moving room. They will then undergo a volitional fatigue protocol, where fatigue is considered reached when the participant reaches a rate of perceived exertion (RPE) of 13 or 76% of their target heart rate. Then, the pre-test protocol will be repeated and evaluated for changes. Customized MATLAB scripts will be used to process the CoP and EEG data and a repeated measures ANOVA will be used to compare pre and post-indicators of fatigue. ANTICIPATED RESULTS: It is predicted that fatigue will decrease an individual's postural control and increase neural activity in brain regions that control balance. It is expected that these effects will be amplified when vision is perturbed.

P119: THE EFFECT OF CORRECTIVE EXERCISES ON BILATERAL KINETIC AND KINEMATIC ASSYMETRIES IN COMPETITIVE COLLEGIATE RUNNERS

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BACKGROUND: Bilateral kinetic and kinematic asymmetries have been shown to have a positive correlation with injury occurrence in some runners (Mo et al., 2020). Limited research has been conducted on the effects of corrective exercise intervention to address abnormal running mechanics (Mokha et al., 2020; Vannatta et al., 2021), and no studies to date have observed the effect of corrective exercises on both the kinematic and kinetic aspects of running mechanics in collegiate runners. The purpose of this study is to determine the effect of corrective exercise intervention on kinetic and kinematic bilateral asymmetries in collegiate cross-country runners. METHODS: The researchers plan to recruit members of Liberty University's NCAA Division 1 Cross-Country team to participate in the study. Descriptive data including age, height, weight and body composition will be obtained upon participant arrival to the Liberty University Motion Analysis Laboratory. Athletes will then run at a self-selected warm up pace for 5 min on an AMTI instrumented treadmill, followed by two 30-second running trials at the following paces: 12.9 km · hr -1 and 19.3 km · hr -1 . During the final 10 seconds of each running trial, 3D GRF (1000 Hz) and 2D video data (100 Hz) will be captured. Vicon Nexus software will be utilized to assess mean peak GRF values for each foot contact in the x, y, and z axis. Kinovea software will be used to assess the kinematic variables for bilateral lower extremities: rearfoot angle during initial contact and midstance, toe-out angle during midstance, knee abduction angle during midstance, and foot rotation angle during mid-swing phase. Based on data analysis, each participant whose kinetic and kinematic measurements occurred outside of normal values, will receive an individualized 8-week corrective exercise program (CEP) to be performed daily. After 8 weeks, participants will return to the laboratory and undergo the same procedures conducted pre-intervention. Participants with < 90 % compliance with their assigned CEP will be excluded from the study. ANTICIPATED RESULTS: It is hypothesized that 8-week individualized CEPs will result in improved running mechanics in competitive collegiate runners, including a reduction in bilateral asymmetries for the variables assessed.

P120: GAIT PARAMETER VARIABILITY DURING OBSTACLE AVOIDANCE

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BACKGROUND: Variations in the thigh-to-shank length ratio can affect the center of mass location and mass moments of inertia, potentially influencing gait variability. Individuals with greater discrepancies in thigh and shank lengths may exhibit higher variability in gait parameters, especially when navigating obstacles. This study aimed to compare gait variability between individuals with smaller than 2 cm) and larger 2 cm differences in thigh-to-shank length during normal gait and obstacle navigation. **METHODS:** Twenty-six participants (age: 22.5, sd 3.1 years) completed 20 continuous, self-paced walking trials across an instrumented walkway, both with and without a stationary obstacle. Dependent variables included stride length, step time, and single support percentage, analyzed using a linear mixed-effects model. Participants were divided into two groups based on thigh-to-shank length differences: Group 1 (less than 2 cm difference) and Group 2 (greater 2 cm difference). **RESULTS:** The presence of a stationary obstacle significantly increased variability in stride length ($p < 0.001$), step time ($p < 0.001$), and single support percentage ($p < 0.001$), as reflected by higher coefficient of variation (%CV) values. However, no significant differences in variability were found between the two groups based on thigh-to-shank length discrepancies (stride length: $p = 0.860$, step time: $p = 0.891$, single support percentage: $p = 0.741$). **CONCLUSIONS:** Navigating a stationary obstacle significantly increases gait variability regarding stride length, step time, and single support percentage. However, thigh-to-shank length differences (≤ 2 cm vs. > 2 cm) do not significantly impact this variability. Further research is required to investigate whether more significant discrepancies in limb length might influence gait control strategies during obstacle navigation.

P121: EVALUATING THE PRACTICAL APPLICATION AND THE RELIABILITY OF PRESSURE SENSOR-EMBEDDED SOCKS FOR ATHLETIC PERFORMANCE MONITORING

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Background: The emergence of pressure sensor-embedded socks presents a potentially field-based method for monitoring vertical G-forces (vGFs), and performance metrics during dynamic activities like countermovement jumps (CMJs). The purpose of this study was to examine the reliability and validity of sensor-embedded socks compared to traditional force plates to calculate jump height (JH), reactive strength index (RSI), and modified RSI (mRSI), as well as mathematically convert the pressure data from the socks to vGFs. **Methods:** Twenty active individuals (age=21.4±1.5 yrs; weight=74.0±20.3 kg) performed CMJs while wearing pressure sensor-embedded socks and standing on Kistler force plates. Data were sampled simultaneously from the socks and force plates at 50 Hz and 1000 Hz, respectively. Reliability of JH and RSI was evaluated using intraclass correlation coefficients (ICCs) and coefficients of variation (CVs), while validity was examined using Bland-Altman plots, dependent t-tests, and Pearson correlations. Vertical G-force calculations to convert the pressure sensor data to vGFs were performed using the formula F = P x A (F = force, P = pressure in Pascals, and A = sensor area). **Results:** Force plates exhibited high reliability for JH (ICC = 0.951, CV = 7.89%), RSI (ICC = 0.575, CV = 13.41%), and mRSI (ICC = 0.843, CV = 13.23%). The socks demonstrated lower reliability for JH (ICC = 0.448, CV = 68.85%), RSI (ICC = 0.165, CV = 31.74%), and mRSI (ICC = 0.607, CV = 35.65%). Bland-Altman plots and dependent t-tests showed agreement between socks and plates ($p \geq 0.121$), with moderate to high correlations between the socks and force plates for all metrics ($r \geq 0.600$, $p \leq 0.005$). Using the formula F = P x A, we were able to convert the pressure-sensor data into vGFs. **Conclusion:** Pressurized sensor-embedded socks may provide an alternative to force plates for field-based assessments of athletic performance. However, their lower sampling rates and questionable reliability, particularly for JH and RSI, suggest that further improvements in sensor technology and data processing are needed. Based on the calculations in the present study, it also appears feasible that data from pressure-sensor embedded socks may be able to be mathematically converted into vGFs, providing a potential field-based assessments of ground reaction forces.

P122: DOES DISTANCE RUNNING HIP EXTENSION STYLE IMPACT KNEE KINEMATICS?

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BACKGROUND: In distance running, the timing of max hip extension varies considerably among runners. Some runners achieve max hip extension at toe-off while others continue to extend the hip 5 degrees or more. It is important to determine if this hip extension action impacts knee kinematics. **PURPOSE**: Compare runners who achieve peak hip extension at toe-off to runners who achieve peak hip extension after toe-off and determine if there are significant differences in knee kinematics. **METHODS**: The participants were 26 Division I cross-country runners (15 males, 19.5±1.2yrs; 11 females, 19.7±1.4yrs; 40+ miles per week). Ten of the runners achieved peak hip extension prior to or at toe-off (Early). Their kinematics were compared to 10 runners who achieved peak hip extension 6+ frames after toe-off (Late). For the data collection, participants ran 3 minutes on the laboratory treadmill at an 8-minute/mile pace (data collected at 3-minutes). The motion-capture data was collected at 200Hz using 6 Vicon Bonita motion-capture cameras and 3DGAIT software. Ten strides were used to generate average plots (normalized to 101 data points) for the hip and knee. The variables of interest for the group comparison included the angle and timing of peak knee extension 1) near toe-off and 2) near stride foot contact. Independent t-tests were used to test for significant differences between the groups ($p=0.05$). **RESULTS**: At toe-off, the Late group (168.0°±3.5°) had significantly more ($p=0.001$) knee extension than the Early group (152.7°±7=12.2°). However, there was no significant difference ($p=0.48$) in the peak knee angle between Early (167.2°±7.3°) and Late (169.2°±4.4°). For the timing of peak knee extension, there was a significant difference ($p<0.001$) between Early (-14.5±6.2 frames) and Late (-1.5±3.0 frames). **CONCLUSION**: The two groups achieved similar peak knee angles. However, the timing of peak knee extension was drastically different. The group that extended the hip late (after toe-off) also extended the knee late. It is important to determine if these running styles are relevant to performance and/or injuries.

P123: ALTERED CORTICAL ACTIVATION DURING OCULOMOTOR CONTROL FOLLOWING COVID-19 INFECTION

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BACKGROUND: With increasing evidence of central nervous system involvement in COVID-19 infection, this study sought to explore the effects of COVID-19 infection on oculomotor control and accompanying cortical activation. We hypothesized significant differences in event-related spectral power would be seen between those who have experienced a COVID-19 infection and whose symptoms resolved within 4 weeks (ACUTE), those who had COVID-19 and at least one symptom persisted longer than 4 weeks (LONG), and those with no history of COVID-19 infection (CONTROL). METHODS: To assess oculomotor function, participants completed six oculomotor control tasks, including a circular smooth pursuit (CSP) task, in a custom-built virtual reality (VR) environment using an HTC VIVE headset with built-in TOBII Pro infrared eye tracking. Cortical activation was assessed simultaneously via a 32-channel dry electrode g.NAUTILUS electroencephalography (EEG) cap. EEG data was processed and analyzed using EEGLAB. RESULTS: Results identified significant differences in mean event-related changes in spectral power between the CONTROL (n = 13) and LONG (n = 14) groups, as well as the CONTROL and ACUTE (n = 16) groups in the alpha ($p < 0.01$; $p < 0.01$), mu ($p < 0.01$; $p < 0.05$), and theta ($p < 0.001$; $p < 0.001$) frequency bands during performance of the CSP eye tracking task. Generally, the CONTROL group exhibited decreases in power among these bands and the LONG and ACUTE groups exhibited increases. No significant differences were seen between the ACUTE and LONG groups during the CSP task. CONCLUSIONS: Results indicate that individuals who experience COVID-19 infection may have altered oculomotor control processing and require greater effort to perform the same task as compared to those who have not experienced COVID-19 infection. This may be indicative of sensorimotor impairment. Additionally, these results do not discriminate between acute and long COVID.

P124: OPTIMIZING SURGICAL APPROACHES: A STUDY OF FIXATION TECHNIQUES FOR HAND FRACTURES

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BACKGROUND: Proximal phalanx and metacarpal fractures are common traumatic injuries that severely compromise hand function, resulting in diminished grip strength and dexterity. This impairment affects both athletes and non-athletes, hindering daily activities and athletic performance. These fractures are typically managed surgically using fixation techniques such as Kirschner wire (K-wire) fixation, plate osteosynthesis, and lag screw fixation. Despite their widespread use, there is limited consensus on the optimal surgical approach. The objective of this study is to analyze and compare the clinical effectiveness of K-wire fixation, plate osteosynthesis, and lag screw fixation in managing proximal phalanx and metacarpal fractures, with a particular emphasis on the impact of plate fixation on key postoperative outcomes, including fracture union rates, functional recovery, and complication incidence. METHODS: A retrospective systematic review will assess surgical outcomes for proximal phalanx and metacarpal fractures treated with K-wire, plate fixation, and lag screws. Relevant studies will be identified through a structured search of electronic databases using predefined criteria. Additionally, we will conduct a retrospective study evaluating the functional outcomes of patients who underwent surgery for these fractures between January 2021 and December 2023. ANTICIPATED RESULTS: We hypothesize that plate osteosynthesis will yield superior outcomes in terms of fracture stability, earlier functional recovery, and lower malunion rates compared to K-wire and lag screw fixation. This study aims to provide an evidence-based comparison to guide the selection of optimal fixation techniques for hand fractures.

P125: SKELETAL MUSCLE CANCER IS THE RAREST OF CANCERS BASED ON ORGAN MASS

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BACKGROUND: Many reports indicate that skeletal muscle cancer is relatively uncommon. However, no study has addressed the relative incidence of primary or secondary skeletal muscle cancer with that of other cancers, particularly when considering organ mass. METHODS: Data regarding organ-specific cancer incidence rates and mean organ mass were obtained from the literature or from established web sites reporting cancer rates, as appropriate. The cancer incidence rate per 1000,000 individuals for each organ-specific cancer was divided by the mean organ mass in grams. RESULTS: Skeletal muscle cancer was by far the least common of all cancers based on organ mass. The next least common cancers by organ mass were heart, bone, brain, and skin at 24, 53, 548, and 847 times more common than that of skeletal muscle. Breast cancer, which is the most common cancer, exhibited an incidence per organ mass that was nearly 20,000 times more common than skeletal muscle cancer. Moreover, bladder, thyroid, ovary, and prostate cancers, although less common than breast cancer, exhibited incidence per organ mass rates that were 1.6, 5.8, 11.0, and 27.6 times more common, respectively, than that of breast cancer. CONCLUSIONS: Skeletal muscle comprises a relatively large proportion of body mass (40-50%), yet skeletal muscle cancer is extremely rare. We propose that this is due to the anatomical organization and microenvironment of skeletal muscle both at rest and during contractile activity. Generative AI statement: Artificial intelligence (AI) tools were used in the collection and analysis of data, writing of the abstract/presentation, and production of images or graphical elements of this abstract/presentation.

P126: SKELETAL MUSCLE MASS ESTIMATION EQUATIONS: A PRACTICAL APPROACH FOR ASSESSING MUSCLE AND STRENGTH RELATIONSHIPS.

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BACKGROUND: There are various methods to measure skeletal muscle mass (SMM), but practitioners may sometimes face resource constraints, making alternative measurement approaches necessary. Thus, the purpose of this study was to evaluate the relationships between different SMM measurements and maximal strength to determine the efficacy of using skeletal muscle estimation equations (SME) as a cost-effective alternative. METHODS: Twenty-two male subjects (21.5±1.8 yrs; 175.5±5.4 cm; 84.5±16.6 kg) participated in a BodPod analysis to assess fat-free mass (FFM), and an assessment of ten sites (bilateral biceps, forearms, quadriceps, calves, neck, and waist) to compute summed muscle circumferences (SMC). SMM was estimated using an SME. Maximal strength was assessed through 1-repetition maximums (1RM) for back squat (BS), bench press (BP), deadlift (DL), and total (TOT). Isometric hand grip strength (HGS) was measured as an additional indirect assessment of strength. Pearson correlation and Hopkins effect size were used to evaluate relationships between SMM measurements and maximal strength. Alpha level was set at $p \leq 0.05$. RESULTS: SME showed strong relationships with FFM ($r=0.922$), SMC ($r=0.937$), and 1RM BS ($r=0.595$), BP ($r=0.469$), DL ($r=0.614$), and TOT ($r=0.597$). HGS demonstrated strong relationships across all 1RM strength measurements ($r=0.557$-0.693) and SME ($r=0.519$). FFM and SMC similarly correlated strongly with all 1RM outcomes ($r=0.529$-0.689) and HGS ($r=0.534$-0.567). All correlations were significant $p<0.001$, indicating strong associations across all measurements. CONCLUSIONS: SME offers an accurate estimate of SMM compared to both indirect FFM and direct SMC measurements. Furthermore, when robust SMM assessments are unavailable or frequent evaluations are not feasible, pairing 1RMs and HGS with SME provides a comprehensive understanding of true SMM.

P127: TREATMENT OF THUMB BASAL JOINT ARTHRITIS

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BACKGROUND: Osteoarthritis is a common condition which increases as individuals age. Symptomatic arthritis significantly affects hand strength and function, increasing the difficulty in performing daily activities. CMC arthroplasty with conchal cartilage interposition grafting is a new surgical technique. It involves widening of the CMC joint space using an electric bur followed by placement of a conchal cartilage graft within the space to serve as a cushion. Theoretically this replaces the cartilage in the joint and reduces pain. Utilizing the patient's cartilage prevents the necessity for immunosuppressive medication which may be necessary if a cadaver cartilage is used. METHODS: A retrospective study was performed to assess functional outcomes of 174 patients who underwent the CMC arthroplasty with conchal cartilage interposition graft procedure. We used the SRS Health EMR Software to conduct a review on patient data dating from 2010-2021. Preoperatively and postoperatively, patients were assessed through factors of pain severity, and range of motion. Risk factors, job occupations, gender and age were also taken into account. RESULTS: Post-operatively, patients were noted to have significant reduction in pain at the base of the thumb with increased range of motion and obtaining a Kapandji score of nine frequently. Complications following conchal cartilage graft harvest from the ear were also minimal and didn't require repeat procedures. CONCLUSIONS: Overall outcomes of this surgical technique were further assessed through optimal functional outcome measurements derived during occupational therapy post-op. This surgical treatment appears to be a satisfactory solution for the treatment of basal joint osteoarthritis.

P128: ASSOCIATION BETWEEN INCREASED BODY WEIGHT AND CENTRAL ARTERIAL STIFFNESS IN YOUTH: A CROSS-SECTIONAL STUDY

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Background: To investigate the association between increased body weight and central arterial stiffness in children and adolescents.**Methods:** 52 participants (26 children, 26 adolescents, 28 females, 24 males) were divided in four groups based on age (7-12 and 13-17 y.o.) and body mass index (BMI<85th and BMI≥85th percentile, kg/m^2): normal weight children (NWCh), overweight children (OWCh), normal weight adolescents (NWAd), overweight adolescents (OWAd). Participants attended one laboratory visit where anthropometrics, aortic blood pressure and carotid-femoral pulse wave velocity (cfPWV) were assessed. Maturational status (MS) was calculated using the Mirwald R.L. et al. (2002) equation. Mean differences between dependent variables were compared using a one-way ANOVA by group with Sidak *post hoc*. Associations between BMI, waist circumference (WC) and aortic systolic pressure (ASP), and cfPWV were assessed using a stepwise multivariable linear regression analysis adjusted for age, MS, and sex.**Results:** cfPWV was higher in

AdOW compared to ChNW (5.4±0.8 *vs*. 4.3±0.4 m/s; $p<0.01$) and in AdOW compared to AdNW (5.4±0.8 *vs*. 4.6±0.5 m/s; $p<0.01$). Compared to ChNW, AdOW showed higher ASP (105.7±11.7 *vs*. 91.8±6.4 mmHg; $p<0.01$) and aortic pulse pressure (34.9±6.2 *vs*. 29.2±4.9 mmHg, $p=0.038$). The six-variable regression model accounted for 60% of the variance of cfPWV ($p<0.01$). Participants more likely had a higher cfPWV with a higher BMI ($p<0.01$), WC ($p<0.01$), ASP ($p<0.01$), and MS ($p=0.01$).**Conclusions:** Overweight is positively and significantly associated with higher cfPWV in adolescents but not in children, and BMI, WC, ASP, and MS are significant predictors of cfPWV in 7-17 years old children.

P129: EXPLORING HEART RATE VARIABILITY RESPONSES TO MEDITATION IN DIFFERENT MENSTRUAL CYCLE PHASES

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BACKGROUND: Meditation is frequently recommended for stress management, and some research suggests it may increase Heart Rate Variability (HRV), a key indicator of cardiac autonomic stress. While there is evidence that HRV may fluctuate throughout the menstrual cycle, consensus is lacking. Little research has explored how meditation impacts HRV during specific menstrual cycle phases. The purpose of the study was to examine acute HRV responses to a guided-visualization meditation during the early follicular and mid-luteal phases of the menstrual cycle. METHODS: Nine eumenorrheic females (age = 22 ± 5 years, height = 164 ± 10 cm, %BF = 32 ± 8) participated in two experimental trials to examine the acute effects of guided-visualization meditation on HRV during the early follicular (Days 1-6) and mid-luteal phases (Ovulation + 5-7 days). Participants completed the Modified Spielberger State-Trait Anxiety Inventory (STAI) pre- and post- meditation. A repeated measures ANOVA was used to analyze the effects of meditation and menstrual cycle phase on HRV and STAI items. RESULTS: Menstrual cycle phase did not significantly impact HRV, as measured by lnRMSSD (p = 0.227), lnHF (p = 0.395) or lnLF (p = 0.149). Further, HRV was not altered by meditation (lnRMSSD, p = 0.441, lnHF, p = 0.511, lnLF, p = 0.218). STAI responses indicated participants felt calmer (p = 0.002), less tense (p = 0.043), and more relaxed (p = 0.017) following meditation. No differences in STAI items were observed between menstrual cycle phases (p > 0.05). CONCLUSIONS: Meditation did not significantly influence HRV; however, it led to improvements in subjective feelings of calmness, relaxation, and reduced tension. HRV and the effect of meditation on HRV were not influenced by the menstrual cycle phase. Although the autonomic response to meditation remained unchanged, meditation may still offer important mental and emotional benefits for stress management.

P130: ACUTE AND CHRONIC EXERCISE-MEDIATED EFFECTS ON MEASURES OF PROLIFERATION AND VIABILITY IN BREAST CANCER CELLS

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BACKGROUND: Although prognosis and survivorship for breast cancer (BC) are improving through more effective screening and treatments, BC survivors (BCS) are now living longer with treatment-related side effects. Exercise is a safe, effective, non-pharmacological means of reducing these side effects, with improved physical function and quality of life amongst the many benefits. However, the direct effects of exercise on BC development and progression have remained relatively unexplored. In vitro studies have demonstrated both acute and chronic exercise interventions independently reduce BC cell growth. However, it is unclear to what degree each exercise type may contribute towards BC cell growth control. Here, we propose a unique model whereby both acute and training-induced exercise are introduced within the same study design to address this knowledge gap. Therefore, the aim of this study is to determine the relative contribution of acute and chronic exercise training on BC cell growth kinetics between BCS and women with no history of cancer (CON). METHODS: 13 female BCS and 13 age-matched CON performed 45 minutes of intermittent cycling at 60% peak power output. Blood samples were obtained at baseline, immediately post-exercise (0h), and 1-hour post-exercise (1h). Participants then completed a 16-week community-based exercise intervention comprised of progressive aerobic and resistance training before repeating the acute intermittent cycling protocol. Participant sera obtained before and after the training intervention during each of the acute exercise time points will be used to culture and treat BC cell lines (10% sera; MCF-7 and MDAMB231). Cell growth will be assessed by the MTS growth assay and cell apoptosis will be detected by Cell Death Detection ELISAplus. Linear mixed models will be used to assess differences in proliferation and apoptosis with changes investigated between groups (BCS v. CON) and exercise type (Acute v Chronic). ANTICIPATED RESULTS: It is hypothesized that acute exercise will stimulate a greater response in cell growth kinetics compared to exercise training. Furthermore, we anticipate naïve BCS sera will induce poorer cell growth kinetics relative to CON; however, BCS cell growth kinetics will be recovered and similar to CON post-intervention.

P131: EXPERIENCES OF A FLIPPED CLASSROOM APPROACH FROM UNDERGRADUATE, KINESIOLOGY STUDENTS: A QUALITATIVE ANALYSIS

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Introduction: The flipped classroom model reverses the traditional teacher-student dynamic by shifting lectures to out-of-class activities and dedicating class time to hands-on, student-centered learning. This approach aims to create a more interactive and engaging learning environment. While the flipped classroom has been explored in various disciplines, few studies have examined its impact in kinesiology fields. Method: A flipped classroom model was implemented in a kinesiology course, Medical Aspects of Sport, over a traditional semester. Lectures were delivered as podcasts for students to engage with outside of class, while in-class sessions focused on interactive activities such as role-playing, peer-led exercise demonstrations, debates, and game-show-style reviews. After 14 weeks, open-ended, qualitative surveys were completed by consenting students. Results: Sixteen students (mean age = 21.3 years; 81% non-Hispanic white, 56% female) completed the qualitative survey, with an average class attendance rate of 87.7%. Most students (75%) responded positively to the flipped classroom format, appreciating the active, hands-on learning during class. The flexibility of podcasts—allowing students to listen at their own pace, revisit material, and multitask—was a major advantage to 75% of the sample. However, some students preferred traditional lectures and admitted to inconsistent podcast engagement. Areas for improvement included increasing accountability for podcast completion and incorporating more instructor-led moments during class. Conclusion: Overall, students responded positively to the flipped classroom approach, which promoted an engaging and flexible learning environment. The use of podcasts for lecture content was well-received, although additional strategies for ensuring podcast engagement and balancing student-led and instructor-led activities may enhance the experience further.

P132: MAPPING HEALTH INEQUITIES: INVESTIGATING HEALTH OUTCOMES IN THE COLUMBIA COLLEGE NEIGHBORHOOD

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BACKGROUND: Most U.S. adults do not meet physical activity (PA) guidelines, and South Carolinians exhibit higher rates of physical inactivity compared to northern/western states. The prevalence of obesity and other chronic conditions is higher among racial minorities, with African Americans (AA) being prone to higher weight gain, poor weight management, and underassessment of health concerns. Given that Columbia College is located in a predominantly AA neighborhood, this study aimed to compare various health and PA outcomes between two neighboring areas in Columbia, SC. METHODS: Six census tract areas surrounding Columbia College (Columbia College census), and five neighboring census tracts (Forest Acres) were grouped and compared against each other for health disparity trends. The most recently published Behavioral Risk Factor Surveillance System (BRFSS) and American Community Survey (ACS) data (2021) was obtained from the U.S. Census Bureau and CDC databases on adults ≥18 years. Using comparative analysis, the following variables were compared between the Columbia College and Forest Acres censuses: (1) obesity, (2) physical inactivity, (3) hypertension, (4) disability, (5) general health status, and (6) diabetes. RESULTS: Findings revealed that ~90% of the Columbia College population identified as AA, compared to only ~25% of the Forest Acres population. Health outcomes showed that the Columbia College census had a ~20% higher prevalence of poor general health status, physical inactivity, and disability, along with a ~15% greater prevalence of obesity and hypertension, and a

~10% greater prevalence of diabetes compared to the Forest Acres census. CONCLUSION: This study highlights the significant disparities and inequities between neighborhoods in Columbia, SC with different racial populations. In predominantly AA communities there was a higher prevalence of physical inactivity and negative health outcomes. Therefore, these findings emphasize the need to address disparities among AA communities. It is critical to explore and better understand PA and healthcare resources/opportunities and consider targeted public health interventions to improve health literacy, access to healthcare, and opportunities to engage in PA in Columbia SC, particularly Columbia College and surrounding areas.

P133: COMPARING ACL RECONSTRUCTION POSTOPERATIVE OUTCOMES IN PATIENTS WITH MEDICAID VS PRIVATE INSURANCE: IS THERE A DIFFERENCE?

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Introduction: There has been growing evidence that insurance status is a major indicator of postoperative outcomes, which has been extensively reported in orthopedic procedures such as shoulder and knee arthroplasty. This study compared outcomes of patients undergoing anterior cruciate ligament (ACL) reconstruction with Medicaid insurance to those patients with private commercial insurance. We hypothesized that patients with Medicaid insurance coverage would have worse patient-reported outcomes and complication rates in comparison to a matched cohort of patients with private insurance. **Methods:** Our departmental registry was queried for all patients who underwent primary arthroscopically assisted ACL reconstruction by 10 surgeons in the practice between January 2018 to June 2022 who were at least 2 years out from their surgery. Eligible patients in the matched cohort model were contacted via telephone for consent to participate in this study and questioned about their pain level, return to sport, physical therapy compliance, and any incidence of retear rates or additional procedures. **Results:** A total of 189 ACL reconstructions were screened during the study period. Comparison of the clinical outcomes within the insurance cohorts revealed that there were no significant differences in Lysholm knee scores, pain scores, revision rate, and return to sport. The only significant difference observed was that Medicaid patients had a greater physical therapy compliance rate. Multivariate linear regression analysis revealed that males had the highest odds ratio associated with higher Lysholm scores. **Discussion/Conclusion:** While Medicaid patients did have a greater physical therapy attendance, this did not improve their postoperative outcomes, which may suggest that Medicaid status may impact physical therapy effectiveness and can potentially be a confounding variable related to other health disparities. Since the multivariate linear regression analysis did not show any associated factors with poorer postoperative outcomes, this may imply that some demographic factors or insurance status may not be contraindications to ACL reconstruction. Despite the lack of significance, males have a greater likelihood of achieving acceptable Lysholm knee value based on the multivariate analysis.

P134: DO FRUIT AND VEGETABLE EXPOSURE AND PREFERENCES DIFFER BY FOOD INSECURITY STATUS?

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Background: Fruit and vegetable(FV) consumption is important for the prevention of chronic disease. U.S. preschool age(2-5 years) children consume inadequate FV, with lower consumption among those living in households experiencing food insecurity(FI; the inability to obtain enough food for a healthy lifestyle). Children from families experiencing FI may lack exposure to FV as their families cannot afford foods their child may reject. It can take many exposures before a child likes a new food, thus those from families experiencing FI may like fewer FV. We evaluated whether preschoolers' FV exposure and preferences differ by FI status. **Methods:** Parents(n=25) completed an online survey (Spring 2024) on their preschool aged child(Xage=3.6years; 48%White, 20%Hispanic, 20%Black, 12%other; 52%living in a household experiencing FI). Surveys included the USDA 18-item Household Food Security Survey(HFSS) and a food preferences checklist. Families who responded yes to 3+ HFSS items were categorized as experiencing FI; 0-2 categorized as food secure(FS). Parents indicated if their child had tried and liked 25 fruits and 34 vegetables; summary scores were calculated. We evaluated differences by FI status using independent samples t-tests. **Results:** Parents indicated similar fruit exposure regardless of FI status [FI:21.4(3.4); FS:20.9(2.9); p>0.05] However, on average children from families experiencing FI were exposed to 3 fewer vegetables than those in FS households [FI:24.5(6.3); FS:28.1(3.9); p=.10; Cohen's d=0.7]. Additionally, parents reported lower availability of fresh vegetables [FI:3.5(0.9); FS:4(0.8); p<0.01; Cohen's d=1.1], frozen/canned vegetables [FI:3.2(0.7); FS:4.2(0.8); p<0.01; Cohen's d=1.2] and frozen/canned fruit [FI:2.9(0.5); FS:3.9(0.9); p<0.01; Cohen's d=1.4] among those considered FI, compared to their FS counterparts. Despite these differences, children liked a similar number of fruits [FI:15.1(5.9); FS:14.6(3.0); p>0.05] and vegetables [FI:11.6(7.7); FS:12.8(5.8); p>0.05] regardless of FI status. **Discussion:** Preliminary findings indicate that preschoolers in households experiencing FI have lower access to FV, despite similar exposure and taste preferences to children in FS households. Increasing FV access may lessen disparities in FV consumption.

P135: THE ASSOCIATION OF WALKING CADENCE WITH SLEEP QUALITY IN ADULTS 18 - 65

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The 2018 Physical Activity (PA) Guidelines state that increased PA is linked to better sleep quality and reduced sedentary time. Step cadence, an emerging metric for assessing PA, is now widely available via consumer wearable devices. However, research concurrently examining PA, sedentary time and sleep quality, particularly using step cadence, is limited. **PURPOSE:** This study explores the relationship between sleep quality, PA, and sedentary time, measured by accelerometry, in adults aged 18 - 65. **METHODS:** A total of 123 participants [78 women, 45 men; mean age 22 ± 8 years, BMI = 25 ± 5)] wore an Actigraph accelerometer for 4 - 7 days. The device was worn on the right hip during waking hours and on their non-dominant wrist during sleep. Participants maintained a sleep log to record in-bed and out-of-bed times. Pearson correlations examined relationships between sleep quality, PA and sedentary time. Independent t-tests compared values between "poor sleepers" [total sleep time (TST) <6 hours or sleep efficiency (SE)] and "normal sleepers". **RESULTS:** Average daily minutes of 0 cadence were associated with sleep SE (r = -0.3, P <0.01), TST (r = -0.4, P <0.01), minutes awake after sleep onset (WASO) (r = 0.2, P >0.05), and sleep fragmentation (SF) (r = 0.2, P <0.05). Incidental movement (1-19 cadence) was associated with WASO (r = -0.3, P <0.01), number of awakenings (r = -0.3, P <0.01) and SF (r = -0.3, P <0.01). Sporadic movement (20-39 cadence) showed similar relationships to incidental movement plus SE (r = 0.3, P <0.01). Poor sleepers by TST criteria had more 0 cadence minutes (571 ± 14 vs. 527 ± 76, P = 0.006), and fewer 1-19 (278 ± 60 vs. 305 ± 66, P = 0.02) and 20-39 (39 ± 13 vs. 46 ± 19, P = 0.02) cadence minutes compared to normal sleepers by SE criteria. CONCLUSION: Results suggest that step cadence, reflecting physical activity and sedentary time, is associated with sleep quality. Higher sedentary time is linked to poorer sleep, while low-intensity physical activity is associated with better sleep quality. Higher-intensity, more purposeful physical activity showed no relationship and was not necessary to improve sleep quality in this sample, when sedentary time was reduced through lighter intensity physical activity.

P136: EFFECTS OF EIM-OC PROGRAM ON SELF EFFICACY

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BACKGROUND: Exercise is Medicine On Campus (EIM-OC) calls upon universities and colleges to promote physical activity as a vital sign of health and connect health care providers with fitness specialists via a referral system for exercise prescription. The purpose of this study was to determine the impact of an EIM-OC intervention on physical activity (PA) behaviors and self-efficacy (SE) at a midsized regional university in Southwest Florida. METHODS: Participants are referred to the EIM-OC intervention by University Recreation and Wellness, Student Health Services, other university departments and self-referral QR codes. Participation is free and includes a PA consultation, assessments, training session, and mentor. Data collection included resting measures, PA participation, cardiorespiratory fitness, body mass index, strength, endurance, flexibility, and a modified Barriers to Self-Efficacy Scale (BARSE). Post assessment data were collected 8-12 weeks after initial testing. Population descriptive statistics and frequencies were summarized and Chi-Square analysis for PA participation and Related-Samples Wilcoxon Signed Rank test for SE values were analyzed with a p-value set at ≤0.05. RESULTS: Since 2019, ninety-one participants

completed the initial consultation, twenty-four completed both pre and post assessments with SE scores obtained for thirteen. 8.7% of participants met PA recommendations of moderate physical activity for 150 min/week before their initial assessment, increasing to 82.6% post intervention, but the chi-square analysis was not significant. The mean SE score increased from 51 out of 100 to 59.2 out of 100. The median differences between pre and post SE score was significant at a p-value of 0.046, rejecting the null hypothesis. CONCLUSION: Overall, this EIM-OC intervention had a positive impact on PA participation and participant SE. Sample size and the use of a modified BARSE tool were the primary limitations of this study.

P138: EFFECT OF HIGH-INTENSITY FUNCTIONAL TRAINING WITH A RESPIRATORY MUSCLE TRAINING DEVICE ON CARDIOAUTONOMIC FUNCTION

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High-intensity functional training (HIFT) can improve resting heart rate (RHR), blood pressure (BP), and heart rate variability (HRV). Respiratory muscle training (RMT) increases breathing resistance and cardiovascular strain, potentially augmenting the effects of HIFT. Therefore, we aimed to determine whether HIFT combined with RMT improves measures of cardioautonomic function. Seventeen recreationally active adults (age = 22.5 ± 5.3y; BMI = 24.2 ± 6.3kg/m^2) were randomized into two training groups with (RMT; M = 6, F = 3) and without (CON; M = 5, F = 3) an RMT device. Training consisted of three 30-minute HIFT sessions per week for six weeks. Each session consisted of four rounds of six HIFT exercises using a 30:30-second work-to-rest ratio, with 2.5 minutes of rest between rounds. RHR, BP (SBP & DBP), and HRV (RMSSD, MnNN, and SDNN; Team Pro, Polar Electro Inc., Kempele, Finland) were measured after five minutes of seated rest in a dimly lit room pre- and post-training intervention. Repeated measures ANOVAs and ANCOVAs using baseline fitness (VO_2max) as the covariate were used to assess effects of the intervention for all variables (α = 0.05). Effect sizes (Cohen's *d*) were also calculated. ANOVAs revealed time main effects for RHR (P = 0.003, ES = -0.43), SBP (P = 0.001, ES = -0.72), and MnNN (P = 0.04, ES = 0.65), with no effect on DBP (P > 0.05, ES = -0.25) or RMSSD (P > 0.05, ES = 0.94). The RMT group had higher SDNN versus CON overall (P = 0.002, ES = 1.55). Once adjusted to baseline fitness, time main effects were no longer significant for RHR (P > 0.05, ES = -0.40), SBP (P > 0.05, ES = -0.16), or MnNN (P > 0.05, ES = 0.40), but the group effect for SDNN remained (P = 0.002, ES = 1.55). Consistent with previous findings, HIFT improved cardioautonomic function with no additional benefit of the RMT device. Once adjusted to baseline fitness, improvements in RHR, SBP, and MnNN were no longer significant, suggesting these training effects are impacted by baseline fitness. Future studies should determine the effects of RMT with aerobic exercise on cardioautonomic function.
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P139: ACUTE EFFECTS OF SERIAL AND INTEGRATED CONCURRENT EXERCISE ON CIRCULATING MICRORNAS -126 AND -222

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PURPOSE: The purpose of this study was to compare changes in circulating microRNAs -126 (c-miR-126) and -222 (c-miR-222) following acute serial concurrent exercise (SCE) and integrated concurrent exercise (ICE) sessions among young, sedentary adults. METHODS: Ten males and 9 females completed the study procedures. For SCE, participants performed resistance exercise (RE) followed by aerobic exercise (AE), without mixing the two. For ICE, participants performed a brief bout of AE before each set of RE. Blood was collected before, immediately after (IP), and 1 h (1HR) after each exercise session. RESULTS: Expression of c-miR-126 significantly increased from baseline at IP (1.6-fold SCE, 2.1-fold ICE; p = .037) and 1HR (1.8-fold SCE, 1.7-fold ICE; p = .034) following both sessions, with no difference between the two sessions. Expression of c-miR-222 significantly increased from baseline at IP (1.7-fold SCE, 1.9-fold ICE; p = .024) and 1HR (2.0-fold SCE, 1.6-fold ICE; p = .038) following both sessions, with no difference between the two sessions. There were no differences in peak heart rate or average heart rate between the two workout sessions. CONCLUSION: SCE and ICE patterns appear equally effective at acutely increasing c-miR-126 and -222.

P140: OBSERVING COUNTERMOVEMENT JUMP STRATEGY CHANGES ACROSS A COLLEGIATE SOCCER PRESEASON USING SINGLE-SUBJECT ANALYSIS

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BACKGROUND: To properly understand changes in countermovement jump (CMJ) performance, one should assess if there was a change in the movement strategy used during the task. Commonly group analysis is used to assess these changes, however, these analyses do not accurately portray what is occurring within each participant. Single-subject analysis (SSA) can provide a deeper insight into individual athlete's fatigue state, which inturn can facilitate a change in movement strategy to obtain the same outcome. The purpose of this study was to use SSA to assess collegiate women soccer players changes in CMJ movement strategy over the course of a preseason. METHODS: Twenty-one collegiate women soccer players were assessed on CMJ performance at the start and end of the preseason. The preseason period was approximately 2 weeks. At both time points, participants completed three CMJs on a portable force plate, Variables of interest included: jump height (JH), time to takeoff (TTT), reactive strength index modified (RSIm), and countermovement depth (CMD). Using the pretest data, coefficient of variation (CV) was determined and then it was added and subtracted from the mean of the three trials to determine each participant's window of biological variation. Change was determined if the individual's post-test mean fell outside the predetermined window. RESULTS: 10 participants saw changes in CMD (5 increases and 5 decreases). 12 participants had changes in TTT (4 increases and 8 decreases). 15 particpants had changes in RSImod (6 increases and 9 decreases). Lastly, 17 participants had changes in JH (5 increases and 12 decreases). CONCLUSIONS: The use of a SSA was shown to provide meaningful data about changes that occurred across a women's soccer preseason. The SSA was able to highlight that not every individual trended similarly with both increases and decreases across all variables Although athletes engaged in similar training sessions, fatigue is experienced at more of an individual, which has typically been masked in group analysis. SSA gives researchers the ability to examine each participant individually, to better understand responses to training and fatigue state.

P141: A SEX COMPARISON OF ACUTE PHYSIOLOGICAL RESPONSES TO ROPE CLIMBING HIGH INTENSITY INTERVAL TRAINING

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INTRODUCTION: No data currently exists regarding the acute physiological responses to rope climbing high intensity interval training (RC-HIIT). As such, the aim of the present study was to compare the acute physiological responses to a single bout of RC-HIIT between sexes and assess the enjoyment of RC-HIIT as a training modality. **METHODS**: Following an overnight fast, anthropometrics and body composition were measured. Resting heart rate (HR), blood pressure (BP), blood lactate (BLa), respiratory exchange ratio (RER), and VO_2 were assessed prior to completing a standardized warm up. Participants then completed an exercise protocol consisting of 10 rounds of 30 sec maximal effort rope climbs interspersed with 60 sec of rest. Gas analysis and HR were recorded continuously during the protocol and rate of perceived exertion (RPE) was recorded following each work interval. BLa was measured two min after completion of the final work interval. At the conclusion of the protocol, participants were asked to complete the Physical Activity Enjoyment Scale (PACES), with possible scores ranging from 16-128. **RESULTS**: 22 recreationally active participants (11M/11F, 24 ± 7 yrs) completed the study. Height (177.3 ± 5.3 vs 165.7 ± 5.2cm), weight (77.3 ± 11.7 vs 62.5 ± 6.9kg), and fat-free mass (69.5 ± 8.9 vs 49.6 ± 5.7kg) were greater

and body fat percent (14.4 ± 4.1 vs 20.5 ± 5.2%) was lower in males compared to females ($p<0.01$). Average exercise VO_2 (20.3 ± 3.2 vs 17.3 ± 2.4 mL/kg/min), peak VO_2 (29.4 ± 5.1 vs 25.0 ± 3.3 mL/kg/min), and post-exercise BLa (11.7 ± 2.8 vs 7.9 ± 2.0 mmol/L) were greater in males than females ($p<0.05$), respectively. No differences between sexes were observed for any other variables during exercise. Additionally, PACES scores (102 ± 16) indicated RC-HIIT was an enjoyable training modality in both sexes.
CONCLUSIONS: In the present study, RC-HIIT induced similar physiological responses in both males and females and was viewed as an enjoyable modality of training.

P142: THE EFFECTS OF ARMY'S TWO-MILE RUN TEST ON INTERLIMB ASYMMETRY IN ROTC CADETS

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BACKGROUND: Interlimb asymmetry refers to the differences between right and left limbs in composition, functionality, and performance. Previous literature suggests that asymmetry scores increase following an intense exercise bout and that greater asymmetry scores are associated with increased injury risk and decreased physical performance. In military populations, musculoskeletal injuries (MSKI) have a direct impact on healthcare expenses and lost time. However, few efforts have been directed at evaluating asymmetries in military populations. Therefore, the purpose of was study was to investigate the effects of a two-mile run test on interlimb asymmetry in ROTC cadets. METHODS: A total of 61 healthy ROTC cadets completed the study. This study encompassed one laboratory visit and two experimental visits at an Olympic-sized track. The laboratory visit included baseline jump testing procedures, anthropometric measurements, and a DEXA scan. The two experimental visits included jump-testing procedures to evaluate interlimb asymmetries before and after a 2-mile walk (control visit) and a 2-mile run (military testing visit). The jump-testing procedures included performing countermovement jumps (CMJ) and single-leg CMJ (SLCMJ) on portable force platforms. Separate two-way repeated measures ANOVA's were performed with alpha set at 0.05. RESULTS: Interlimb asymmetry from both bilateral and unilateral assessments did not change significantly (all p's > 0.05) across walk or run conditions (CMJ Peak Propulsive Force Δ: 2.0N vs. 2.3N for run and walk, respectively). Leg lean mass asymmetry was correlated with asymmetries in average and peak propulsive and braking forces as well as mid-thigh girth asymmetries (r^2 range = 0.12 to 0.31). CONCLUSIONS: Functional jumping interlimb asymmetries did not appear to change in response to the Army's two-mile run test. The results reported here could have been influenced by the fatiguing protocol utilized. To date, the research literature has not addressed the etiology of overuse injuries in the military. Future studies should aim to evaluate the influence of interlimb asymmetries in the development of overuse injuries in military populations.

P143: RELIABILITY OF METABOLIC THRESHOLDS AND THE ASSOCIATED RATINGS OF PERCEIVED EXERTION

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BACKGROUND: Ratings of perceived exertion (RPE) are commonly used to prescribe and monitor exercise intensities appropriate to elicit cardiorespiratory adaptations. The gas exchange threshold (GET) and respiratory compensation point (RCP) provide information about the relative metabolic intensity of exercise. Determining the RPE associated with these thresholds may improve individual exercise prescriptions. This study examined the test-retest reliability of the GET and RCP as well as the RPE at the GET (GET_{RPE}) and RCP (RCP_{RPE}) from two graded exercise tests (GXT). **METHODS:** Nine men (mean±SD, age=24±4 years, weight = 80.0±9.26 kg, VO_{2peak}=45.7±8.0 mL·kg^{-1}·min^{-1}) completed two cycle ergometry GXTs to determine the GET and RCP. Each GXT started at 80 W with 30 W increases every 2-min until a pedal cadence of 70 rev·min^{-1} could not be maintained. RPE was recorded after each 2-min stage. The GET and RCP were determined from visual inspection as the point of departure from linearity of the VCO_2 versus VO_2 and V_E vs VCO_2 relationships, respectively. Linear regression of the VO_2 versus RPE relationship was used to determine the GET_{RPE} and RCP_{RPE}. Analyses included paired samples t-tests ($p\leq0.05$), intraclass correlation coefficients ($ICC_{2,1}$), standard errors of measurement (SEM), coefficients of variation (CoV), and minimal differences (MD). **RESULTS:** There were no significant differences between test 1 (T1) and test 2 (T2) for the RPE_{GET} (T1=13±2, T2=13±2, p=0.33), RPE_{RCP} (T1=16±1, T2=17±1, p=0.12), GET (T1=30.1±8.6 mL·kg^{-1}·min^{-1}, T2=28.3±7.1 mL·kg^{-1}·min^{-1}, p=0.07), or RCP (T1=38.0±8.6 mL·kg^{-1}·min^{-1}, T2=38.7±7.1 mL·kg^{-1}·min^{-1}, p=0.48). The RPE_{RCP} (ICC=0.504, SEM=0.8, MD=2.2, CoV=5.0%) exhibited "poor" reliability. However, "excellent" reliability was demonstrated for the RPE_{GET}, (ICC=0.820, SEM=0.8, MD=2.1, CoV=6.1%), GET (ICC=0.935, SEM=1.8 mL·kg^{-1}·min^{-1}, MD=5.0 mL·kg^{-1}·min^{-1}, CoV=6.2%), and RCP (ICC=0.939, SEM=2.0 mL·kg^{-1}·min^{-1}, MD=5.5 mL·kg^{-1}·min^{-1}, CoV=5.2%). **CONCLUSIONS:** The RPE_{GET} and RPE_{RCP} reflect the perceptual intensities associated with the unique physiological responses at the GET and RCP, respectively, and may be used to assign training intensities. However, the RPE_{RCP} may not be as sensitive to indicate changes in the RCP across time, given its relatively poor reliability.

P144: EFFECTS OF TWO-MINUTES VERSUS FOUR-MINUTES ACTIVE RECOVERY ON A "BOOSTER" VO2MAX TREADMILL TEST

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Maximal aerobic capacity (ie. VO2max) represents an individual's cardiovascular fitness level. Prior studies have assessed various VO2max protocols with several studies suggesting that a booster max, with a two-minute (2min) active recovery period, improves final VO2max values in many subjects. However, a four-minute (4min) active recovery period for booster max testing has not been evaluated. This study's purpose was to assess the impact of 2min vs. 4min active recovery on VO2max values. In a counter-balanced order, 41 aerobically trained males completed one of two treadmill VO2max GXT (Max1) trials, a 2min- or 4min active recovery, and a second max exertion (Max2). Seventy-two hours later, subjects completed a 2nd GXT with the alternate recovery time used during the first trial. Max1 and Max2 values for 2min and 4min were compared using a Paired-Samples t-test with significant differences at $p < 0.05$. For 2min, Max1 (53.35 + 8.55 ml/kg/min) and Max2 (53.58 + 8.99 ml/kg/min) were significantly different ($p < 0.001$). Max2 for 2min was significantly different ($p < 0.001$) than Max2 for 4min (54.7 + 8.84 ml/kg/min). Max1 (52.56 + 8.71 ml/kg/min) and Max2 for 4min were significantly different ($p < 0.001$). Max1 for 2min and Max1 for 4min were significantly different ($p < 0.001$). Mean results suggest Max 2 for both 2min and 4min active recovery were significantly different, and 4min did yield significantly higher values from Max1 to Max2. Additionally, individual data shows that 63.4% of subjects improved (+ 2.22 ml/kg/min) from 2 min active recovery, while 75.6% of subjects improved (+ 2.94 ml/kg/min) after a 4 min active recovery. Future research should examine potential changes in VO2max with differing 2 min vs 4 min active recovery booster max protocols using aerobically trained females as well as different types of male and female aerobic athletes.

P145: INTER-RATER RELIABILITY OF THE MODIFIED FUNCTIONAL BALANCE TEST WITH COGNITIVE LOAD IN FIREFIGHTERS

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BACKGROUND: Musculoskeletal injuries induced by slip/trip/fall mechanisms are among the most common firefighter injuries. The modified functional balance test (mFBT) is used to evaluate dynamic balance while simultaneously being challenged to listen and recall critical operational information - simulating an occupational task. However, there is a lack of research on the interrater reliability of this assessment, limiting its use in field and research settings. Therefore, the purpose of this study was to determine the interrater reliability of the mFBT during a cognitive challenge in firefighters. METHODS: 18 male career firefighters (Age: 38.9±7.8 yr; Body mass: 102.1±17.4 kg; Fat: 24.6±6.9%) completed 2 familiarization sessions prior to testing. Then, firefighters performed 3 mFBT trials in personal protective equipment while listening to radio communications and were

asked to recall this information following the test. Specifically, the firefighter walked on a 3.7 m plank while stepping over and bending under obstacles of standardized heights as fast as possible. Summation of completion time and major (2 s penalty) and minor (1 s penalty) technical errors yielded a Performance Index (PI). Two observers independently scored the mFBT completion time and PI via video recordings taken from 2 electronic devices. Intraclass correlation coefficients (ICC[95% CI]) and difference scores (absolute and relative comparisons) were used to evaluate interrater reliability and agreement, respectively. RESULTS: The interrater reliability for the mFBT time was "almost perfect" (ICC=0.997 [0.993-0.999]) and displayed strong agreement (Diff=0.06±0.29 s; 100.3±2.0%). Likewise, the interrater reliability for the PI was almost perfect (ICC=0.993 [0.981-0.998]) and reflected strong agreement (Diff=0.19±0.46 s; 101.2±3.2%). The interrater reliability and percent agreement across participants and trials was ICC=0.956[0.885-0.983] and 68.5% agreement for minor errors and ICC=0.977[0.940-0.991] and 98.1% agreement for major errors, respectively. CONCLUSIONS: These findings indicate that using the mFBT with a cognitive load produces almost perfect interrater reliability for time and PI outcomes, but moderate agreement of minor errors when using video analysis.

P146: THE IMPACT OF THE MENSTRUAL CYCLE ON CARDIORESPIRATORY OUTCOMES DURING HIGH INTENSITY INTERVAL EXERCISE

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BACKGROUND: Hormone fluctuations across the low (LHP) and high-hormone (HHP) phases of the menstrual cycle (MC) may influence exercise performance. This analysis aimed to evaluate the impact of MC phase on cardiorespiratory outcomes (heart rate [HR], volume of oxygen [VO_2], and respiratory exchange ratio [RER]) during high-intensity interval training (HIIT). **METHODS:** Thirty-five recreationally active females (Mean ± SD; age: 24.3 ± 6.1 yrs, VO_{2peak}: 1.91 ± 0.58 L/min) completed training in a random order beginning in the LHP or HHP. Heart rate HR (bpm), VO_2 (L/min), and RER (a.u.) were evaluated during an acute bout of HIIT (10×60s/60s) in females. A mixed-effects model assessed the effect of fixed variables (exercise bouts, MC phase, and MC phase×bout) on HR, VO_2, and RER. Mixed-factorial ANOVAs evaluated the influence of fixed-effect and random-effect variables on outcomes. Paired t-tests were conducted for differences between MC groups. **RESULTS:** MC phase did not have a significant effect on HR (p=0.09), VO_2 (p=0.67), and RER (p=0.44), nor did MC phase's interaction with exercise bouts on HR (p=0.13), VO_2 (p=0.84), and RER (p=0.79). The progression of exercise bouts had a significant effect on VO_2 (p<0.01) and HR (p<0.01), increasing by 0.02 L/min and 1.76 bpm per bout, respectively. When accounting for random trends between MC phases and bouts for each individual, the ability to accurately model relationships for each participant improved significantly. (p<0.001). Paired t-tests suggest no significant mean difference between MC groups for HR (0.40 bpm), VO_2 (0.01 L/min), RER (-0.01 a.u.). **CONCLUSION:** The present findings show that MC phase does not appear to impact cardiorespiratory variables during HIIT- suggesting that females can and should perform exercise at high intensities in both MC phases. However, the significant improvement in the model with the inclusion of random effects for each participant indicates unique individual responses across MC phases. While MC phase may not influence overall cardiorespiratory outcomes, understanding individual variations can help optimize exercise strategies for better performance.

P147: DOES PURPOSEFUL DOG TRAINING RELATE TO HUMAN-DOG PHYSICAL ACTIVITY, FITNESS AND DOG COGNITION?

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Background: A dog companion has benefits for physical activity for the human and dog. People purposefully train their dogs which may improve dog cognition. It is unknown if human or dog fitness is impacted by training. We hypothesize that higher training volumes will correlate with better human and dog physical activity, fitness and dog cognition.
Methods: We recruited dogs and their human companions for testing. 13 humans (age: 42±18 years;1M/12F) were tested for fitness (6 minute walk, chair stand, handgrip test) and asked a questionnaire about physical activity with their dog and the Dog Executive Function Scale (DEFS). Training volume calculation included formal training and sport involvement. Dogs (N=19; age: 4±3years; 10M/9F) were also tested for fitness (percent fat, back up, squat progression test) and cognition (object choice, unsolvable task). We analyzed data using Pearson product moment correlation and general linear model analysis (human fitness, physical activity=Training volume+b)(Dog fitness, cognitive, DEFS=Training volume+b).
Results: We found that training volume correlated with reported vigorous exercise (total kcal/wk; R=-0.54, p=0.03) and the DEFS score (R=0.56, p=0.02). Training volume also had a significant main effect on DEFS (F=6; p=0.03) and Vigorous exercise (F=6, p=0.03). DEFS score was also related to the unsolvable task time looking at owner (% time; R=0.51, p=0.03). Walking with dog (min/wk) was correlated with the 6 min walk test distance (meters; R=0.48, p=0.04), the chair stand test (reps; R=0.47, p=0.04) and the dog back up test (feet; R=0.49, p=0.03).
Conclusions: We found that training volume related to higher reported vigorous activity (human and dog) and higher executive function for the dog. However, training volume did not correlate with dog or human fitness. Walking with the dog was related to the 6 min walk test and the human chair stand test and the dog back up test, suggesting that walking with the dog can impact human and dog fitness.

P148: EFFECTS OF BACKWARD RUNNING ON VO2MAX AND HAMSTRING STRENGTH OF FEMALE SOCCER PLAYERS

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BACKGROUND: Backward running and walking protocol implementation has been shown to cause significant improvements in VO2 max values and forward running economy in athletes. It has also been shown to cause significant improvements in strengthening of musculature supporting the knee and improving hamstring muscle flexibility. Using backward running training to specifically test both VO2max and hamstring strength has not been examined specifically in female soccer players. Therefore, the purpose of this study is to observe the impact in backward vs. typical forward training implementation on VO2max and hamstring strength values in female soccer players. METHODS: Eleven to thirty female college soccer players will be recruited for this study. Anthropometric data will be collected from subjects and their body composition analyzed using an Inbody 770 Body Composition Analyzer. Female soccer players of high fitness levels will complete a six-week backward or forward running protocol, consisting of two sessions per week with at least 48 hours in between each session. Participants will be randomly evenly assigned to a forward running or a backward running group and each perform the same warm up, running session, and training with the same coach. Testing will take place at week 0 (pre) and week 7 (post) and will consist of a VO2 max test on a treadmill utilizing a metabolic measurement system as well as a hamstring strength test utilizing an Isokinetic Dynamometer. Repeated measures ANOVA will be used to analyze VO2max and hamstring strength values within backward and forward running groups. One-way ANOVA will be used to analyze between-group measures. All statistical analyses will have an alpha level of 0.05 and 95% confidence intervals. ANTICIPATED RESULTS: We tend to believe that there will be greater significant improvements in VO2 max and hamstring strength values for the backward running group compared to the forward running group.

P149: ASSESSING NEUROMUSCULAR FATIGUE IN COUNTERMOVEMENT JUMP PERFORMANCE ACROSS A COLLEGIATE WOMEN'S SOCCER PRESEASON

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BACKGROUND: The countermovement jump (CMJ) sensitivity to detecting change when fatigue is present, makes it a valuable tool for assessing neuromuscular fatigue. Neuromuscular fatigue has been shown to play a part in altering jump performance across periods of training and competition in soccer athletes. The purpose of this study was to assess for neuromuscular fatigue in collegiate women soccer players over a preseason using a CMJ. METHODS: Twenty-one collegiate women soccer players were assessed on CMJ performance at the start and end of the preseason. The preseason lasted approximately 2 weeks leading into the first competition. During both pre- and post-testing, participants completed three CMJs on a portable force plate. Variables of interest included: reactive strength index modified (RSImod), jump height (JH), time-to-takeoff (TTT),

propulsive duration, propulsive force, and propulsive impulse. Changes in jump performance was assessed using a paired sample t-test to compare pretest and posttest values. An a priori alpha level of 0.05 was also used to assess for changes. RESULTS: No statistically significant differences were seen from pre to post testing across all variables of interest. However small to moderate effect sizes were seen in RSImod (Pre: 0.32 ± 0.08 vs. Post: 0.30. ± 0.07, p = 0.07, d = 0.42) and TTT (Pre: 0.852 ± 0.13 ms vs. Post: 0.900 ± 0.15 ms, p = 0.127, d=-0.35). DISCUSSION: This study shows that during a soccer preseason, the participants were able to maintain CMJ performance. The reduction in RSImod appears to be a result of an increase in TTT. RSImod is a ratio of JH and TTT, thus no changes seen in JH and a small increase in TTT would create a reduced RSImod. Interestingly, participants appeared to maintain a movement strategy over the course of the preseason as no changes were seen in propulsive force and duration. Thus, future investigations should examine if individual fatigue responses are masked when using group analysis such as the one employed during this investigation.

P150: EXAMINING WORKLOAD ACROSS SPEED BANDS DURING PRESEASON AND COMPETITIVE SEASON GAMES IN COLLEGIATE SOCCER PLAYERS

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BACKGROUND: The advancement of wearable technology allows for collection of measurements during soccer activity, including external workload (EWL) and speed bands (SBs). Athlete's EWL and SBs can provide proper insight on the demands of competitive play and can further influence training program design. PURPOSE: This study examined SBs and EWL differences during games, in both preseason (PS) and competitive season (CS) (PS:2 weeks, CS:10 weeks) in collegiate male soccer players. SBs were determined by sensor developers and are categorized between four zones ranging between 0.98-10 m/s. EWL was determined by total distance traveled during competitive games in meters (m). METHODS: Eighteen (age: 19.6±1.2 years, height: 180.7±8.3cm, mass: 75.6±7.4kg) Division I collegiate male soccer players were monitored using a wearable accelerometer supporting Global Positioning Systems (GPS). The 10Hz Titan +1 (2"x1.5"x0.25") sensor (Houston, Texas, United States) was held between the scapulae of each participant via vest and was used to track games across the preseason and competitive season. Sensors were distributed by the coaches fifteen minutes prior to the start of a game to allow for proper synchronization. Sensors were collected immediately after the completion of each session. To guarantee proper athlete monitoring, participants were excluded from the study if the total number of sessions recorded was less than 75% (n=2). A series of paired sample t-tests with an alpha level of $p<0.05$ were used to compare differences in EWL and SBs between preseason and competitive periods. RESULTS: Paired samples t-tests revealed significant differences between PS (6483.0±3317.8m) and CS (8407.3±4086.7m) game EWL ($p<.05$). These tests also revealed significant differences between PS and CS game SB's respectively ($p<.05$). CONCLUSION: Significant differences between PS and CS game EWL signify there is an increase in distance covered per game in the CS compared to PS. Significant differences between the SBs signify athletes are spending more time at greater speeds during the CS games compared to PS. This study provides athletic personnel with reports that can aid in creating training programs reflective of the demands during the competitive season.

P151: EFFECT OF ACCENTUATED ECCENTRIC LOADING TEMPO ON POST ACTIVATION PERFORMANCE ENHANCEMENT DURING A BACK SQUAT

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BACKGROUND: Accentuated eccentric loading (AEL) has gained popularity due to its potential to enhance eccentric force production compared to traditional resistance training. However, most research has used loads ranging between 120-80% 1-repetition maximum (1RM). To our knowledge, no research has investigated the effect of AEL while using a light load (40% 1RM) during the concentric portion of the movement. Therefore, the purpose of this study is to examine the effect of tempo during an AEL back squat with a light concentric load on lower body power output. METHODS: Nine male participants in a randomized cross-over design study separated by seven days. The participants completed a 5x3 back squat protocol with 100% 1RM on the eccentric portion and 40% 1RM during the concentric portion of the movement with a 1 second eccentric (FT) or 3 second eccentric tempo (ST). After each set, the participant passively rested for three minutes and then performed two countermovement jumps arms akimbo. Jumps were performed on force plates and were analyzed using a customized Excel spreadsheet to extract jump height (JH), peak power output (PPO), concentric and eccentric impulse, reactive strength index-modified (RSImod), and time to takeoff. Repeated-measures ANOVA were performed to determine differences between tempo and across sets. Cohen's d effect sizes were calculated to determine magnitude of differences. Alpha level was set a $p < 0.05$. RESULTS: Results indicated that JH (0.43 ± 0.07m vs. 0.41± 0.07m) and PPO (4875 ± 763 W vs. 4577 ± 744 W) decreased during the FT condition ($p < 0.05$) but did not during the ST condition. CONCLUSIONS: It appears that FT leads to a decrement in lower body power output via a decrease in eccentric impulse. This may be from limited tension that is generated by the muscle during the FT. Practitioners should investigate different tempos to see if lower body power is enhanced to a greater extent when doing a light concentric load during AEL protocols.

P152: FITNESS MEASURES AS PREDICTORS OF PERFORMANCE ON A LAW ENFORCEMENT OCCUPATIONAL PHYSICAL ABILITY TEST: A PILOT STUDY

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BACKGROUND: Limited research exists describing how fitness influences performance in law enforcement officers (LEOs). LEOs have limited time available for physical training, necessitating a time efficient way to evaluate fitness. This study evaluated a novel occupationally-relevant physical ability test (PAT) for LEOs, as well as identified fitness predictors of PAT completion time. METHODS: Career LEOs (n = 46) rotated through a series of fitness tests designed to mimic job tasks, including: (1) a modified Illinois Agility Test (IATT) with a cognitive task and plank time (PT); (2) summed grip strength test (GST), followed by a 500-meter row and range shooting; and (3) a submaximal PAT (e.g., climbing stairs, navigating hurdles, dummy drag), including an isometric mid-thigh pull (IMTP) and countermovement jump (CMJ). Descriptive statistics were calculated as means SD. Correlations were used to identify relationships between PAT time and each fitness variable (i.e., IATT, PT, GST, IMTP, CMJ). A multiple linear regression was conducted to determine predictors of PAT time. An alpha value of 0.05 determined statistical significance. RESULTS: The group mean for each fitness variable is as follows: PAT time (140.45 33.29 sec), PT (80.81 44.56 sec), GST (93.03 29.90 kg), IATT (23.69 5.91 sec), CMJ (15.86 5.53 in), IMTP (297.45 101.82 lbs). PT, GST, CMJ, and IMTP, all demonstrated trivial-to-small, nonsignificant relationships with PAT, whereas IATT exhibited a moderate correlation ($r = 0.69$, $p < 0.0001$). The regression identified IATT and PT as the strongest predictors of PAT time. CONCLUSION: This study highlights the importance of agility and trunk endurance among LEOs, suggesting that both should be targeted to improve job-specific performance. Additionally, IATT and PT may be utilized as formative evaluations when targeting PAT performance. Despite limited relationships with PAT time, the testing battery allowed a time efficient way to measure several biomotor abilities among this population. Further research is needed to explore other fitness variables and their potential impact on law enforcement occupational tasks.

P153: THE EFFECT OF DEPTH OF COLD-WATER IMMERSION ON POST-EXERCISE SORENESS

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BACKGROUND: Muscle soreness can reduce activity and effectiveness of training. Cold-water immersion has become a common recovery practice. Little research examines depth of cold-water immersion on exercise induced soreness particularly if the sore limb should be submerged to elicit potential recovery responses. The purpose of this study was to determine the effect of depth of cold-water immersion on post-exercise muscle soreness. METHODS: This between groups study design randomly assigned male participants to waist deep or shoulder deep cold-water immersion. Each participant performed a standard eccentric bicep curl protocol followed by a randomly assigned level of cold-water immersion. At baseline and 24 hours after immersion,

participants were assessed for active range of motion (AROM), perceived soreness with palpation on a 10 pt scale, and bicep circumference. AROM was assessed by goniometer. Perceived soreness was assessed by algometer at a pressure of 40 N using the Visual Analogue Scale (VAS) ranging from 1 (no soreness) to 10 (worst soreness). Circumference was assessed with a constant tension tape measure every other cm for the length of the bicep. After baseline, participants completed a standard eccentric protocol of bicep curls. Immediately after exercise, participants submerged into the ice bath for 5 minutes at 15 degrees C at waist deep or shoulder deep immersion. Twenty-four hrs after immersion, assessments were repeated. RESULTS: Twenty-four hours post-exercise and immersion, AROM declined 4% for shoulder depth and 2% for waist depth ($p>0.05$) compared to baseline. Perceived soreness was 22% less for shoulder immersion and waist level declined 14% ($p>0.05$). Arm circumference increased 1.7% and waist level immersion decreased 4% ($p>0.05$). CONCLUSION: While not significant between shoulder and waist immersion, measures of soreness and swelling exhibit different trajectories 24 hours post-exercise that warrant further investigation.

P154: THE EFFECT OF LOWER LIMB BLOOD FLOW RESTRICTION EXERCISE PRIOR TO COUNTERMOVEMENT JUMP

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BACKGROUND: Blood flow restriction (BFR) can be an effective technique to enhance peak power and velocity when combined with resistance training. The purpose of this study is to identify the effect of lower limb BFR during a single bout of back squat on the peak performance of a countermovement jump. METHODS: Men and women (18-25 years old) resistance training at least three days a week for the last 3 months were recruited. Participants completed a health history and informed consent. The University IRB approved the study. The study consisted of a repeated measures design of three trials. For trial one, participants completed a warm-up prior to determining the weight that elicits 0.6 to 0.7 m/s during the concentric phase of the back squat on the Smith Machine. Concentric velocity was assessed using a linear position transducer (Gymaware). After a rest period, participants were familiarized with commercially available standard BFR cuffs placed on the proximal thighs while performing 2 reps of back squat. Forty-eight hours after the initial visit, participants returned to complete the BFR or control condition using the load determined in trial 1. Participants performed three countermovement jumps (CMJ) on force plates (Hawkin Dynamics) measuring peak jump height and velocity. Participants performed 3 repetitions of the back squat with either the BFR strap engaged or without any other intervention. After the 3 reps, participants waited 4 minutes and performed 3 reps of the CMJ on force plates. At least 48 hours later, participants returned for the third visit to complete the BFR or control condition. RESULTS: Participants did not significantly change in CMJ height (ΔBFR: -0.01 ± 0.001 m $p>0.05$); ΔCON: 0.0 ± 0 m, $p>0.05$). There was a trend to improve peak velocity during the jump after BFR (ΔBFR: -0.04 ± 0.01 m/sec $p = 0.08$); ΔCON: 0.0 ± 0 m/sec, $p>0.05$). CONCLUSION: Adding BFR during exercise prior to countermovement jumps does not significantly affect peak jump height or velocity.

P155: HOW SOCIAL MEDIA AFFECTS ATHLETIC AND MENTAL PERFORMANCE

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BACKGROUND: The use of social media has been a very controversial topic for people of all ages. It has been said to lower self-esteem and be a factor in anxiety and depression. The purpose of this study is to determine whether social media has a negative effect on physical performance or causes a decline in self-confidence. Previous studies have shown that social media use before going to sleep may correlate with a decline in athletic performance the following day. Further, prolonged social media use before resistance training has been shown to negatively affect the overall performance of the athlete. **METHODS:** Twenty collegiate athletes, 10 male and 10 female, will be recruited for participation in this study. Each participant will be randomized to either look at social media or refrain from social media for at least 30 minutes prior to meeting in the gym. Then, participants will perform 3 sets of hex bar deadlift until failure with a three-minute rest period in between. Lastly, they will take Self-Compassion Scale Short Form (SCF-SF) to measure self-compassion. The study will use a randomized crossover design with the same measures being repeated either with or without social media use prior. Results will be analyzed using repeated measures ANOVA. **ANTICIPATED RESULTS:** It is hypothesized that social media will have a negative effect on the participant's physical and mental performance. The scores on the SCF-SF are expected to decrease with the social media being implemented. It is also anticipated that females will be more heavily impacted by the social media than males due to more critical social norms/expectations.

P156: WHAT HAPPENS TO VELOCITY DURING FLYWHEEL EXERCISE AT DIFFERENT LOADS?

William Munson, Kevin Carroll. *East Tennessee State University, Johnson City, TN.*

WHAT HAPPENS TO VELOCITY DURING FLYWHEEL EXERCISE AT DIFFERENT LOADS? WD Munson[1], KM Carroll[1]·. [1]Department of Sport, Exercise, Recreation and Kinesiology, East Tennessee State University, Johnson City, TN

PURPOSE: The purpose of this study was to examine the differences in movement velocity between 6 progressive inertial loads in a flywheel (FW) training device. METHODS: Data were analyzed from a previously conducted study where 11 participants performed 1 set of 13 squats of 6 progressive inertial loads: Load 1 = 0.010 kg·m^2, Load 2 = 0.035 kg·m^2, Load 3 = 0.050 kg·m^2, Load 4 = 0.060 kg·m^2, Load 5 = 0.075 kg·m^2, Load 6 = kg·m^2. The first 3 repetitions and last 3 repetitions mean concentric velocities (MCV) were averaged together for each load and each participant. A paired samples *t*-test was used to compare first and last repetitions across the different loads. A Cohen's *d* effect size was also calculated between variables. The alpha level was set as $p < 0.05$ and effect sizes were evaluated using Hopkins scale of interpreting effect magnitudes. RESULTS: The *t*-test yielded no statistical significance ($p > 0.05$) between the first and last 3 MCV for all of the different loading schemes. Effect size statistics indicated that 3 loads increased MCV over the completion of the set ($d = 0.15$ - 0.64) and 3 loads decreased the MCV over the completion of the set ($d = 0.029$ - 0.408). These effect magnitudes ranged from trivial to moderate. DISCUSSION: Previous research has shown movement velocity as an effective means for monitoring free weight resistance training. Our investigation suggests that movement velocity may behave differently in FW than what has been reported in free weight training. However, it is yet to be observed under which conditions MCV may significantly decrease within a set of FW exercise. Future investigations should examine a variety of loading and repetition schemes during a FW exercise.

P157: EXAMINING EXERCISE SELF- EFFICACY AND FUNCTIONAL MOBILITY IN URBAN LAW ENFORCEMENT OFFICERS

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BACKGROUND: Law enforcement officers perform various physically demanding tasks, but much of their daily activities are sedentary or light intensity. Quality movement patterns are vital for fitness, reducing the risk of injuries and contributing to motivation for physical activity. **PURPOSE:** This study examined the relationship between exercise self-efficacy (ESES) and functional mobility (FMS) among law enforcement officers. **METHODS:** 55 officers participated, with exercise self-efficacy measured using the ESES scale and movement patterns assessed with the Functional Movement Screening (FMS). Correlational analysis and linear regression were used to explore the relationships between FMS and ESES, years of service (YoS) and FMS, and YoS and ESES. One-Way ANOVA analyses were used to determine differences between job groups and both FMS and ESES. **RESULTS:** Participants included 34 males and 21 females, average age 38.8 years, with 10.8 average years of service (YoS). Job roles: 57.4% field officers, 21.3% administrative/command staff, and 21.3% civilian/non-sworn. A statistically significant positive relationship was found between ESES and FMS ($r = .441$, $p = 0.002$), with FMS explaining 19.4% of ESES variability. A significant negative relationship existed between YoS and FMS ($r = -0.382$, $p = 0.009$), explaining 14.5% of FMS variability. No significant correlation was found between YoS and ESES. One-Way ANOVA revealed significant FMS score differences among job groups, with sworn officers scoring higher than civilian non-sworn ($p = 0.03$). No significant differences were found between Admin/Command Staff and other groups. ESES scores across job groups were not significantly different. **CONCLUSIONS:** Higher ESES correlates with increased FMS, but FMS

diminishes with years of service. The findings highlight the need for continued support in movement training and fostering physical activity confidence, especially for experienced officers.**Generative AI Statement:** Generative AI was used for editorial assistance in refining and condensing the content of this abstract.

P158: INFLUENCE OF MAXIMAL MENTAL EFFORT DURING STRENGTH TRAINING ON PHYSICAL FUNCTION ADAPTATIONS IN OLDER WOMEN

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BACKGROUND: Neural decrements contribute to age-related declines in physical function. Cognitive strategies targeting neural adaptations, such as maximal mental effort (ME), may work synergistically with simultaneous strength training. However, this remains largely unexplored for practical, dynamic strength training in older adults. The purpose of this study was to determine the effects of elastic band training combined with ME on physical function adaptations in older women. METHODS: As part of an ongoing study, 31 healthy older women (70.5±4.2 yrs) were randomly assigned to an elastic band training (EBT; n=9), elastic band training with ME (EBT+ME; n=12), or control (CON; n=10) group. EBT and EBT+ME performed moderate intensity, whole-body elastic band training 3 days per week for 6 weeks, but EBT+ME was instructed to "imagine maximally contracting their muscle" during the concentric phase of each repetition. Before and after the intervention, subjects completed a 4-m walk test to obtain preferred (PWS) and maximal (MWS) walking speed. Subjects were instructed to walk "at their usual pace," for PWS and "as fast as safely possible" for MWS, respectively. Subjects also performed a 30-s chair rise task by completing as many chairs rises as possible in 30 seconds. Time to complete the first 5 rises (CR5) and total rises completed (CR30) were recorded. Two-way repeated measures ANOVAs were used to analyze changes between groups. RESULTS: Only EBT+ME increased MWS (p=0.001; g=0.90), while PWS increased similarly between groups (p=0.07; ES=0.13). CR5 and CR30 were unchanged (p>0.05; ES=0.07-0.18). CONCLUSIONS: These findings indicate that ME during moderate intensity elastic band training improved MWS beyond training alone, but not other physical function outcomes. Utilizing ME during practical, resistance exercise may augment some adaptations in older adults, but additional research is needed.

P160: RELIABILITY OF ADP AND BIA BODY COMPOSITION WITH WATER AND CREATINE INGESTION IN COLLEGE-AGED FEMALES

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BACKGROUND: Air Displacement Plethysmography (ADP) and Bioelectrical Impedance Analysis (BIA) determine body composition (BC). ADP uses Boyle's law which differs from BIA utilizing electrical current flow. With ADP being relatively new, reliability to detect rapid changes has been questioned. The purpose of the study was to observe the differences in ADP and BIA in detecting changes in BC following two hydration manipulation methods: 1) water intake and 2) creatine supplementation that were previously only studied in men. METHODS: Fourteen physically active female participants (age 20.97+0.98y) completed both parts of the study. After an 8-hour fast, ADP and BIA tests were conducted. Participants then drank 500 mL increments of water totaling 2,000 mL with an ADP (BodPod 2020 COSMED) and BIA (HBF-514C, OMRON) test following each increment. Following this, participants were instructed to creatine load for 7 days (20 g/day) with creatine (BodyTech). Fat Mass (FM), Fat-Free Mass, weight, and BC (%) were recorded on a data sheet. Ran a MANOVA with repeated measures to investigate time effects and paired samples t-test to compare between BIA and ADP. RESULTS: There were significant differences between each water BIA test ($p<0.05$) showing an increase in FM%. There were no significant differences found between FM% of the last test of BIA water and creatine BIA ($p>0.05$) as well as ADP creatine and BIA creatine ($p>0.05$). Significant differences were found between FM% of ADP test 1&3 ($p<0.05$) and overall weight after water and creatine was consumed ($p>0.05$). CONCLUSION: Water consumption did affect ADP and BIA measurements of body composition but there were no significant findings supporting BIA being more affected than ADP or vice versa. Similar outcomes will arise following rapid water intake and prolonged creatine supplementation in relation to overall weight. Water consumption and water retention can influence body composition analysis performed by ADP and BIA.

P161: THE EFFECTS OF A 6-WEEK SPRINT TRAINING PROTOCOL ON SPRINT PERFORMANCE IN DIVISION I COLLEGIATE MALE SOCCER ATHLETES

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Background: This study evaluated a 6-week sprint training protocol (STP) on Division I male soccer players' sprint performance. Sprint training is critical for developing maximal speed in soccer, yet is often overshadowed by aerobic conditioning. While sprinting accounts for only 1-11% of match distance, it is vital in key moments. Previous research has focused on resisted or assisted sprints, but this study involved unresisted sprints without technical practice to enhance performance while athletes maintained their regular training routines.Methods: Participants included twelve male soccer athletes aged 18-24, who completed a 6-week sprint protocol, totaling 12 sessions. Each session involved warm-up sprints, followed by acceleration and maximum velocity trials, measured using the Dashr|Blue timing system. Twelve athletes participated in two 10-yard sprints from a static start to assess acceleration, followed by two 10-yard sprints with a 20-yard build-up to measure maximum velocity. The protocol was conducted twice weekly, with testing in weeks 1, 4, and 6. Data were analyzed via repeated measures ANOVA. Results: There were significant improvements in maximal velocity and acceleration from week 1 to week 4, but a statistically significant performance regression in week 6 from week 4, remaining above baseline. Regression occurred after one week of no sprint training. Significant improvements were noted in 10-yard acceleration ($p < .001$), with week 1 average times of 1.78 ± 0.07 seconds improving to 1.50 ± 0.05 seconds by week 4. Maximal velocity showed similar trends, decreasing from 1.11± 0.05 seconds in week 1 to 1.00 ± 0.03 seconds in week 4 ($p < .001$). Conclusion: Unassisted sprint training may enhance acceleration and maximal velocity in collegiate soccer players even while participating in practice and weightlifting simultaneously. Significant improvements may be made with only 2 sprints focused on acceleration and 2 sprints at maximal velocity each week. However, performance gains diminish without weekly training. These findings are relevant to collegiate soccer programs because it demonstrates that sprint training does not have to be extensive or time consuming to increase performance. It is recommended that coachesinclude sprint training at least once weekly to maintain improvements.

P201: FIGHT OR FLIGHT: VIRTUAL REALITY BOXING VS TRADITIONAL CARDIO FOR MOOD REGULATION

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Background: Traditional exercise is widely recognized as an effective method to reduce stress and improve psychological states. However, a significant percentage of the population remains inactive. Common barriers include time constraints, inconvenience, and social factors. Therefore, exploring novel exercise modes that can overcome these challenges while providing similar psychological benefits is crucial. **Purpose**: To assess changes in mood following a single bout of moderate-intensity continuous exercise (MICE) and virtual reality boxing (VRB). **Methods:** Participants [*N*= 20, 12 males; age (*M* ± *SD*); 26.1 ± 7.2 yrs; BMI (*M* ± *SD*); 26.4 ± 5.8] completed the Profile of Mood States (POMS) before (pre), immediately after (post), and 20-min following (post-20) MICE and VRB on separate days. Both exercise conditions were 30-min; 5-min warm up, 20-min active exercise, and 5-min cool-down. **Results:** Most notably, there was a significant time main effect for all psychological variables. Specifically, Depression [Cohen's d= .87], Confusion [Cohen's d= .84], and Total-Mood Disturbance [TMD; Cohen's d= 1.19] decreased while Esteem-Related Affect [ERA; Cohen's d= .93] and Vigour [Cohen's d= 1.96] increased from pre- to post exercise. Further, Tension [Cohen's d= .95], Depression [Cohen's d= .81], Confusion [Cohen's d= .80], and TMD [Cohen's d= .76] were significantly reduced, and ERA [Cohen's d= .41] was significantly increased from pre- to post-20. Anger was significantly reduced from pre- to post-20 VRB only. **Conclusion:** After engaging in VRB and MICE, participants reported significant psychological benefits with no adverse events. While VRB had the added benefit of reducing Anger, both exercise modes produced similar, beneficial effects on mood regulation. Consequently, VRB

should be considered as a viable alternative to traditional exercise to enhance mood states.

P202: EXPLORING EFFECTS OF RETROSPECTIVE REPORTING WITHIN ECOLOGICAL MOMENTARY ASSESSMENT RESEARCH IN PHYSICAL ACTIVITY

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BACKGROUND: Ecological momentary assessment (EMA), which allows capture of time-series data, is gaining popularity to understand the complexities of physical activity (PA) behavior. Specifically, event-contingent EMA (i.e., respondent initiates data collection at target points) is necessary to assess integral aspects of each PA experience (e.g., pre-activity states / motives; post-activity recall of pleasure / exertion). However, collecting momentary data is prone to human-error in engagement under real-world circumstances (e.g., delayed reporting), which may challenge data usability or lead to misleading results. Therefore, the purpose of the proposed study is to explore the potential impact of non-momentary EMA data on associations between relevant pre- and post-PA variables. **METHODS:** The current project is a secondary analysis of a parent study wherein participants (n=22) initiated EMAs in response to purposeful PA sessions for 10-wk (≥10min; 604 sessions reported). If one or both momentary surveys were forgotten, an option to complete a retrospective report was included; 50% of PA sessions were recorded retrospectively. Following initial examinations of heterogeneity in direction of effects for within-person associations, repeated measures correlation procedures will be applied to estimate common within-person associations for paired measures. These procedures will be applied with and without the inclusion of retrospective data. **ANTICIPATED RESULTS:** It is anticipated that, by demonstrating the potential for differing interpretations of results due to retrospective reporting, this exploratory work may guide the design of subsequent event-contingent EMA research targeting PA.

P203: COMPARISON OF OPTIMISM AND HEART RATE VARIABILITY

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BACKGROUND: Athlete optimism has been linked to workout adherence along with injury prevention and recovery. Improved heart rate variability (HRV) represents better managed stress, which has been associated with decreased injury risk and better athletic performance. Research has yet to elucidate whether any link between optimism and HRV exists, but such link could be potentially explanatory for why optimism is linked with injury prevention. The purpose of this study was to determine if any correlation between athlete's optimism and HRV exists. **METHODS:** 30 male and female active collegiate athletes were recruited for this study. All data was collected within a single visit. Optimism was recorded via the optimism survey. Heart rate variability data was collected using a polar heart rate strap. Bivariate correlation analysis was used to determine if any significant correlations exist.**RESULTS:** Both heart rate and optimism were correlated with HRV (r = -.660, p = >0.001 and r= .404, p= 0.027; respectively). **CONCLUSIONS:** Optimism and HRV appear to be correlated in collegiate athletes. This could indicate that optimism is a factor in determining athletes' stress levels. By improving optimism, we may be able to increase athletic performance and prevent injury.

P204: ASSESSING THE IMPACT OF HIGH THEACRINE DOSES ON HEMODYNAMIC MEASURES, COGNITIVE PERFORMANCE, AND PHYSIOLOGICAL STRESS

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BACKGROUND: Theacrine (TCR) is a natural supplement that exhibits stimulant properties. Preliminary evidence shows improved feelings of energy with no increase in heart rate (HR), systolic blood pressure (SBP), and diastolic blood pressure (DBP) after consumption. This study investigated the effect of different doses of TCR relative to body weight on hemodynamic variables and subjective feelings of energy. METHODS: 19 normotensive men and women (20.7 ± 2.1 years; BMI: 26.0 ± 4.2 kg/m2) who were habitual caffeine consumers completed this randomized, double-blind, crossover design study. Participants completed a baseline visit followed by four experimental visits with at least a 7-day washout between visits. Participants were randomly assigned one of four treatments during each experimental visit: Placebo (PLA), 3 mg/kg TCR, 6 mg/kg TCR, or 9 mg/kg TCR. Brachial HR, SBP, and DBP were assessed. Feelings of energy, alertness, and mood were assessed via a visual analog scale. Measurements were completed pre-treatment, then 60, 90, 120, 150, and 180 minutes post-treatment. RESULTS: Repeated measures ANOVA revealed no significant condition x time effects for HR, SBP, and DBP. There was a significant condition effect for DBP ($p = 0.003$) with the 3 mg/kg TCR (1.8 ± 3.8 mmHg), 6 mg/kg TCR (2.8 ± 3.8 mmHg), and 9 mg/kg TCR (3.9 ± 4.3 mmHg), all increasing DBP compared to the PLA ($p < 0.001$). There was also a significant time effect for HR ($p < 0.001$) and DBP ($p < 0.001$). After TCR consumption, HR was significantly lower at 60 minutes (-8.3 ± 3.5 bpm; $p < 0.001$) and 90 minutes (-9.6 ± 3.2 bpm; $p = 0.048$) post-treatment and remained lower over the rest of the time points compared to pre-treatment. DBP increased across all time points, from 66.3 ± 7.4 mmHg pre-treatment to a peak of 70.8 ± 6.6 mmHg at 180 minutes post-treatment. There were significant condition x time effects for energy ($p < 0.001$) and focus ($p = 0.025$), with these feelings increasing post-treatment of PLA. CONCLUSIONS: TCR supplementation at increasing doses relative to body weight did not impact SBP and HR while moderately increasing DBP. The effects of TCR supplementation on subjective feelings of energy and focus are unclear as these measures increased only after PLA and remained stable after TCR consumption.

P205: LONGITUDINAL CHANGES IN INFLAMMATORY BIOMARKERS ACROSS ADOLESCENCE

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BACKGROUND: Previous cross-sectional studies suggest that increased BMI is associated with higher levels of low-grade systemic inflammation. Adolescence is a period of rapid growth and development, including pivotal changes in lifestyle behaviors that influence body composition and thus, the potential to alter biomarkers of inflammation. Yet research exploring longitudinal changes in inflammatory biomarkers among adolescents is limited and it is not clear if the balance between pro- and anti-inflammatory biomarkers is altered during this time. The purpose of this study was to examine changes in inflammatory biomarkers across adolescence while considering changes in BMI. METHODS: As part of a larger longitudinal study, adolescents had measures of BMI (N=273) and inflammatory biomarkers (IL-6, IFN-gamma, IL-10, IL6:IL10; N = 244-259) taken at 2-4 times across adolescence (age range: 15-19+years). Random intercepts mixed effects models assessed within-person changes in biomarkers over time, with BMI as a time-varying covariate to control for changes in growth. All outcome variables were transformed (log + 1), to improve normality of model residuals. Given the longitudinal nature of the study, participants were dropped from the model if they had fewer than 2 observations of a specified outcome, and each N is presented in model results. RESULTS: Mean BMI was 23.82±6.1 kg/m^2 at baseline and increased across adolescence (N=273, F=53.48, $p<0.01$). Model results demonstrated a significant change from baseline (age 15-16) for all biomarkers. IFN-gamma (N=259, F=16.73), IL-6 (N=250, F=5.57), and IL-10 (N=246, F=9.73), increased across adolescence (all p values<0.01), while the ratio of IL-6:IL-10 decreased (N=244, F=3.91, $p<0.01$). BMI did not influence these changes (all p values>0.05). CONCLUSION: Despite the increase in all biomarkers from baseline, the decrease in the IL-6:IL-10 ratio is indicative of a shift towards a more anti-inflammatory profile. Contrary to most cross-sectional evidence, BMI did not influence biomarker changes in this sample of adolescents.

P206: ASSOCIATIONS BETWEEN SKELETAL MUSCLE MASS, LEAN BODY MASS, AND SALIVA OSMOLALITY

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BACKGROUND: The purpose of this investigation was to explore and evaluate the relationships between skeletal muscle mass (SMM), lean body mass (LBM), and hydration status measured via saliva osmolality (SOSM). Based on prior research showing that people with large amounts of SMM and LBM have elevated urine specific gravity and osmolality, it was hypothesized that SMM and LBM would be positively associated with SOSM. METHODS: SOSM was measured using the MX3

Hydration Testing System, a portable, handheld, non-invasive osmometer. Seventy-two adults (42 men, 30 women; 29.3±10.6 yr, 170.8±8.8 cm, 78.8±15.0 kg, 28.7±8.1% body fat percentage) presented two saliva samples approximately 3 to 5 minutes apart. Fluid intake was avoided for at least 5 minutes prior to sample collections. Linear regression (unadjusted and adjusted for age, sex, and past four-hour fluid intake) and Pearson correlations were used to examine the relationships between variables. RESULTS: Correlation co-efficients and unstandardized betas (B) from regression showed positive but non-significant, small associations between SMM and SOSM [r(72) = .17, B = .44, p = .144] as well as between LBM and SOSM [r(72) = .16, B = .23, p = .172]. The adjusted regression analyses including covariates showed insignificant associations between SMM and SOSM (B = .99, p = .129) and LBM and SOSM (B = .45, p = .154). CONCLUSION: Despite growing evidence that SMM and LBM have an impact on hydration status as measured by urine variables, SMM and LBM seem to be less strongly associated with SOSM. This may be related to smaller amounts of muscle metabolites (e.g., creatinine, uric acid, urea) found in saliva.

P207: EVALUATION OF NUTRITION KNOWLEDGE AND DISORDERED EATING PATTERNS IN DIVISION III FOOTBALL PLAYERS

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BACKGROUND: Division III football players engage in rigorous training programs; yet, most teams often lack access to a registered dietitian and/or sport nutritionist to guide their nutritional choices. Although evidence is readily available for Division I players, research on Division III remains scarce, despite the distinct differences in demands and available resources. The purpose of this study was to explore disordered eating patterns and nutrition knowledge among Division III football players. METHODS: Fifty-two Division III Football athletes participated in the initial surveys (n = 52, age = 20 +/- 1, %BF = 22 +/- 10). The first laboratory visit evaluated body composition via dual-energy X-ray absorptiometry (DXA), and the athletes completed a General Nutrition Knowledge (GNK) questionnaire and the Eating Attitudes Test (EAT-26) to assess nutrition knowledge and disordered eating habits. Athletes were then instructed to complete a 10-week macronutrient tracking intervention (PRO = 1.2-1.4 g/kg/day, CHO = 5-7 g/kg/day, FAT = 20-35% of total calorie intake) that required daily logging of their intake. Disordered eating habits were assessed after the intervention using the EAT-26 survey (n = 33, age = 19 +/- 1, %BF = 23 +/- 9). RESULTS: Paired samples t-test indicated EAT-26 scores did not significantly change post-intervention (p = 0.397). At the initial visit, less than 2% of athletes (n = 52) presented with a score above 20 (mean = 6.4 +/- 5.4, range = 0-30). Among the three subscales, the highest values were observed in the dieting subscale (mean = 4.0 +/- 3.5, range = 0-12). The mean score on the General Nutrition Knowledge Questionnaire was 51% +/- 12%. The lowest scores were observed in the sections on dietary recommendations (50.8 +/- 13.7) and diet, disease and weight management (50.3 +/- 15). CONCLUSIONS: The findings indicate that disordered eating habits, as measured by the EAT-26, were not prevalent among Division III football athletes. However, the results highlight a substantial gap in their nutrition knowledge, suggesting a critical need for improvement. To better support these athletes, future research should explore the effectiveness of targeted nutrition education programs, particularly for players who lack access to a registered dietitian or sports nutritionist.

P208: ACUTE EFFECTS OF BEETROOT JUICE AND PINE BARK EXTRACT CO-INGESTION ON HIGH INTENSITY AEROBIC PERFORMANCE

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BACKGROUND: Nutritional ergogenic aids are commonplace when it comes to improving athletic performance. Supplementation with natural products that have high amounts of dietary nitrates, such as beetroot juice (BRJ), cause various physiological effects that lead to improved performance through mechanisms of vasodilation and improved mitochondrial efficiency. Additionally, flavonoids and antioxidants have been found to benefit performance by counteracting free radicals that cause oxidative stress. Specifically, French maritime pine bark (PB) has been shown to increase overall health as well as endurance performance. For athletes looking to improve time to exhaustion and performance, BRJ and PB have independently shown to be beneficial. However, the effects on high intensity aerobic performance during acute co-ingestion of BRJ and PB are limited. METHODS: 15 healthy, trained athletes between the ages of 18-45 will be recruited for this randomized, double-blind, placebo-controlled study. The subjects will have a total of five lab visits, including an initial maximal graded exercise test, and four time trials to exhaustion on a cycle ergometer at a constant load of 100% power at VO2max (pVO2max). Each time trial will be separated by a minimum of 48 hours to allow for proper metabolization and excretion of the supplements, including 400mg of nitrate, and 200mg of PB. Prior to each visit, subjects will refrain from vigorous exercise for 24 hours, and will be fasted for a minimum of 4 hours. Three hours before each time trial, subjects will be randomly assigned to consume one of the following: placebo, BRJ, placebo+PB, or BRJ+PB. Immediately prior to the time trial, subjects will warm up for 10 minutes, including 30% of pVO2max for 5 minutes, followed by 70% of pVO2max for 1 minute, and 4 minutes at 30% pVO2max. Thereafter, subjects will be placed at 100% pVO2max, and time to exhaustion will be recorded. Additionally, metabolic data will be obtained during each visit using a MGC Diagnostic metabolic cart. This data will be used to determine the efficiency of exercise at the set load. ANTICIPATED RESULTS: It is hypothesized that acute co-ingestion of BRJ+PB will have the greatest effect on increasing time to exhaustion and exercise efficiency.

P209: PERFORMANCE-ENHANCING DRUGS ON SOCIAL MEDIA: EVALUATING THE QUALITY OF INFORMATION ON TIKTOK

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BACKGROUND: TikTok is one of the fastest growing and largest social-media platforms, making it a powerful tool for sharing information. Growing social-media presence of performance enhancing drugs (PEDs) coupled with ease of access often leads people to turn towards TikTok as a source of health information on PEDs, but these short format videos may be of questionable accuracy and content. The purpose of this study was to evaluate the reliability and quality of TikTok videos for several common PEDs. METHODS: Common performance-enhancing drugs search terms including "Anavar", "Dianabol", "Clen" (clenbuterol), "Tren" (trenbolone), and "HGH" (human growth hormone) were queried through the TikTok app. The top 50 videos for each search term were evaluated based on the Global Quality Score (GQS), Journal of American Medicine Association (JAMA) criteria, and modified DISCERN score. Video characteristics such as type of content/content creator and mention of side effects were also recorded. Descriptive statistics and comparison among source and category types were performed. RESULTS: A total of two hundred fifty videos were included in the study and when combined were viewed nearly one hundred sixty million times. The mean GQS, JAMA, and mod-DISCERN scores were 1.75 ± 1.08, 1.03 ± 0.16, and 0.69 ± 0.97 respectively, indicating poor quality content. 42% of the videos mentioned potential side effects of PEDs. The videos had a median length time of 32 seconds and the vast majority of the content creators were non-medical (99.6%) compared to medical (0.4%). CONCLUSIONS: There is a growing public interest in PEDs; however, online information from TikTok regarding PEDs is often poor quality. With the growing influence of social media, poor understanding of potential side effects or consequences of PED misuse may be detrimental to patient safety.

P210: SEASONAL VARIATION OF PHYSICAL AND SEDENTARY ACTIVITY IN FEMALE COLLEGIATE ATHLETES

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BACKGROUND: Physical activity (PA) is generally accepted to improve cardiovascular health. One measure of PA is how many steps are taken per day, with 8,000-10,000 steps/day being the goal and less than 5000 steps/day being considered sedentary. Sedentary behavior (SB) can increase the likelihood of risks and have negative impacts on overall health. The purpose of this study was to examine differences in daily average steps and measured sedentary time in NJCAA female student-athletes during the competitive season and off-season. METHODS: Ten NJCAA female student-athletes at a two-year university participated in this study during the competitive season and off-season. The student-athletes wore a GT3X ActiGraph accelerometer for seven days. Steps and measured SB were averaged to give a daily value. Paired t-tests were used to determine if differences existed between the competitive season and off-season. The level of

significance was set at p<0.05. RESULTS: There was a significant difference in the average steps between the competitive season (8085.63 ± 2142.09), and off-season (6371.96 ± 1867.16), p = 0.011. No significant difference was found in measured SB between the competitive season and the off-season (535.11 ± 89.4 min/day vs. 504.59 ± 114.14 min/day) p = 0.360. CONCLUSIONS: Although average daily steps were lower in off-season compared to competitive season, both averages were above the sedentary cut-off value. There was very little difference in measured SB between the two seasons. Previous studies support these findings by demonstrating that individuals who are considered active can also have high amounts of SB. Due to the preliminary nature of this multi-year investigation, the primary limitation of this study is the relatively small sample size. This should serve as a reminder for athletes to remain physically active to reap the health benefits during the off-season. Supported by the Research and Productive Scholarship Grant

P211: EFFECT OF SCHOOL-BASED ACTIVITY ON QUALITY OF LIFE IN CHILDREN WITH DISABILITIES

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BACKGROUND: Regular physical activity (PA) has been shown to improve cognitive performance and behavior, reduce overweight/obesity rates, and reduce the risk of developing chronic diseases. While the benefits of PA are well known, children with disabilities tend to be less active than their typically developing counterparts. This sedentary behavior increases the risk of chronic disease development, becoming overweight/obese, and decreases cognitive and motor function in children with disabilities, thus reducing quality of life (QoL). Given the amount of time children spend in school, incorporating PA during the school day could be beneficial to improve cognitive and motor performance, as well as emotional and social health. Therefore, the purpose of this study was to investigate the effects of school-based PA on QoL in children with disabilities. METHODS: Three special education classrooms participated in a 6-week school-based PA program implemented by the classroom teachers. Fourteen participants (13M/1F mean age 9.08 years) performed 2 30-minute physical activity sessions 3 times per week for six weeks. QoL was measured before and after the 6-week PA program using the age appropriate PEDSQL™ for each participant. A series of paired T-tests were performed to determine if there were improvements in the self-reported overall QoL and each domain separately, with a significance level of alpha=0.05. RESULTS: Results indicate that there was no statistically significant change in QoL (or domains) following the 6-week PA program. One classroom reported a decrease in QoL following the PA program. However, the other two classrooms reported a slight increase in QoL following the PA program. CONCLUSION: Our results indicate that a 6-week program may not be sufficient to elicit improvements in QoL in children with disabilities. Additional investigation into the minimum duration of school-based PA programs is warranted.

P212: IMPACT OF SLEEP ON BODY COMPOSITION IN ADOLESCENTS: MEDIATING ROLE OF DIET AND PHYSICAL ACTIVITY

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BACKGROUND: Sleep is one of the most important qualities of everyday life. Most college students don't get the recommended amount of sleep; the average college student gets less than 7 hours of sleep each night. Better sleep quality has also been shown to improve eating habits and physical activity levels; whereas inadequate sleep can lead to lower levels of physical activity and poor eating behaviors. Poor sleep can also increase the risk of developing cardiovascular disease by increasing inflammation, promoting obesity, and causing hormonal changes. Previous research has identified a positive association between sleep and obesity in young adults. The purpose of this study is to investigate the impact of sleep on body composition and examine the mediating roles of diet and physical activity in high school seniors transitioning into college. METHODS: This longitudinal study will recruit high school seniors (n=75, 50% females) aged 17-18 years old. Baseline assessments will occur during their senior year of high school and follow up in their second semester of college. Sleep regularity, efficiency, and duration will be measured using an actigraph GT9X Link accelerometer. Sleep satisfaction will be assessed through the Pittsburgh Sleep Quality Index (PSQI). Body composition will be analyzed using a Dual X-ray Absorptiometry (DXA). Sedentary behavior and physical activity ratio will be assessed via activPAL. Dietary habits will be assessed using the Automated Self-Administered 24-hour Dietary Assessment tool (ASA-24). Relationships between sleep, diet, physical activity and body composition will be evaluated using multiple linear regression and mediation analyses.ANTICIPATED RESULTS: We anticipate that poor sleep habits will negatively affect changes in body composition. Physical activity and diet will play a significant role in mediating the relationship between sleep habits and body composition. Participants with better dietary habits and higher levels of physical activity despite poor sleep habits will experience fewer negative changes in body composition. FUNDING: Funding for this project will be provided by the National Heart, Lung, And Blood Institute of the National Institutes of Health under Award Number R15HL159650.

P213: AFTERSCHOOL RX: USING A COMMUNITY-BASED PRESCRIPTION TO IMPROVE MOVEMENT BEHAVIORS AMONG CHILDREN WITH ELEVATED CARDIOMETABOLIC RISK

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Background: This pilot study tested the preliminary effect of providing prescriptions for free, community-based afterschool programs (ASPs) to improve children's movement behaviors (physical activity [PA] and sleep), to ultimately reduce cardiovascular risk. **Methods**: Twelve children (10.5±1.2 years; 58% female; 50% White) with elevated cardiovascular risk factors (overweight/obesity; elevated blood pressure) were provided 17-weeks of free ASP (local YMCA) in Spring 2024. Children wore an Axivity AX3 on their non-dominant wrist for 14 days before and during the ASPs to measure PA and sleep. Accelerometry was processed using GGIR (v3.1.4) with the Hildebrand cut-points. Mixed effects models compared children's movement behaviors on weekdays at both time points. Sex, age, and accelerometer non-wear time were included as covariates. **Results**: At baseline, children had an average nocturnal sleep duration of 403.1±81.8min, spent 469.9±154.3min physically inactive, spent 405.3±229.6min in light PA (LPA), and spent 51.6±35.2min in moderate-to-vigorous PA (MVPA). Mixed effects models suggested that on days the ASPs were offered, children had significantly more MVPA (B=8.7; 95CI=1.1, 16.2) compared to baseline. By contrast, children had significantly less LPA (B=-135.5; 95CI=-173.8, -97.3) and spent significantly more time physically inactive (B=117.6; 95CI=69.8, 165.3). There was no significant change in children's nocturnal sleep duration. **Conclusion**: This pilot study found mixed preliminary results in the efficacy of ASP prescriptions on at-risk children's movement behaviors; therefore, future studies need to include larger sample sizes to give confidence to our findings. Additionally, future studies need to examine how this combination of improved and worsened movement behaviors impacts cardiovascular risk among children. Furthermore, future research may consider evaluating the time segmentation of when these behaviors are occurring within the day.

P214: CROSS-VALIDATION OF CADENCE AS A PREDICTOR FOR THE WALK-TO-RUN TRANSITION IN HEALTHY ADULTS

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Background: The walk-to-run transition (WRT) is the natural yet sudden shift from walking to running. A prior study reported that cadence was a stronger predictor of the WRT than other commonly used indicators such as gait speed of ~2.1 m/s and a Froude number (a dimensionless value that accounts for leg length) of 0.5 (unitless). Specifically, cadence values of 135 and 140 steps/min demonstrated excellent classification accuracy (>90%) for WRT prediction in healthy adults. Notably, the authors called for cross-validation in a separate sample to confirm their findings. Purpose: To determine the sensitivity, specificity, and accuracy of cadence-based thresholds (135 and 140 steps/min) for predicting the WRT in a secondary, independent sample. Methods: Participants (N = 44, aged 22±3.5 years, 68% women) completed four*3-min treadmill bouts at 0.89, 1.34, 1.78 and 2.24 m/s (2, 3, 4, and 5 mph). Cadence was calculated by dividing the total number of steps (via hand count and video) by bout duration. Each treadmill bout was classified as "walking" or "running" based on gait mode (i.e., absence or presence of flight phase). Receiver operator characteristic (ROC) curve analysis and

confusion matrices were used to compute classification accuracy metrics (sensitivity, specificity, and accuracy) for the previously identified cadence thresholds in the current dataset. Youden's Index (sensitivity + specificity - 1) was used to identify the optimal cadence for WRT thresholds in this sample. Results: Cadence thresholds of 135 and 140 steps/min shared equal sensitivity (100%). However, specificity and accuracy were higher for the cadence threshold of 140 steps/min (95.5% and 96.6%, respectively) in comparison to 135 steps/min (92.4% and 94.3.6% respectively). Additionally, an optimal cadence for WRT prediction was 139 steps/min, yielding identical sensitivity, specificity, and accuracy (100, 95.5, and 96.6%, respectively) as the 140 steps/min threshold. Conclusions: These findings support the validity of 135 and 140 steps/min thresholds for predicting WRT, with the 140 steps/min threshold performing better overall in the current dataset. Future studies could explore how run-to-walk thresholds correspond with these cadence-based WRT thresholds.

P215: THE IMPACT OF OUTDOOR WALKING ON PERCEIVED STRESS LEVELS IN COLLEGE STUDENTS.

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BACKGROUND: College students frequently encounter high levels of stress, highlighting the need for effective stress management methods beyond traditional medication and therapy. Outdoor walking has been suggested as an accessible intervention for managing stress, but its effects on perceived stress in college students are not well understood.**PURPOSE:** This study aimed to examine the impact of a four-week outdoor walking program on the perceived stress levels of college students.**METHODS:** Seventeen participants (8 females, 9 males) were randomly assigned to either an experimental group (n=9) or a control group (n=8). The experimental group completed a one-mile walk once a week for four weeks, while the control group did not participate in any walking intervention. Both groups completed the Perceived Stress Scale (PSS), Health-Promoting Lifestyle Profile II (HPLP II), and International Physical Activity Questionnaire (IPAQ) one week before and one week after the intervention. Data were analyzed using paired samples and independent samples t-tests in IBM SPSS software, with significance set at $p < 0.05$.**RESULTS:** No statistically significant differences were found in self-reported stress levels between the experimental and control groups' post-test scores (HPLP II: p=0.995; PSS: p=0.513; IPAQ: p=0.495). Although the experimental group's PSS scores decreased from 19.44 ± 7.83 to 16.00 ± 4.53, this reduction was not statistically significant (p=0.181).**CONCLUSION:** The four-week walking program did not significantly reduce perceived stress levels among college students. Future studies should explore the optimal exercise volume necessary to achieve significant stress reduction.

P216: EXPLORING INFLUENCES ON MOVEMENT BEHAVIORS, PHYSICAL FUNCTION AND FATIGUE AMONG CANCER PATIENTS

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BACKGROUND: Healthier movement behaviors (physical activity [PA], sleep duration, and sedentary behavior [SB]) have been found to reduce side effects of cancer therapies as well as improve prognosis and survival; however, most cancer survivors spend up to 70% of their time in sedentary activities and only ~14% engage in moderate-to-vigorous PA (MVPA) necessary for health benefits. Previous research with cancer survivors has utilized isotemporal substitution models to look at the relationship between movement behaviors and health outcomes; however, the nature of these models is cross sectional, missing the natural variability of an intervention. The 24MB paradigm makes the argument that it may not be just the improved PA from being at the intervention that matters, but it may be how attending the intervention impacts a patient's time spent in each behavior along the movement continuum throughout the day that matters. Therefore, the aim of this project is to examine the day-level impact of attending a physical activity intervention on 24MBs among cancer patients . METHODS: I will be leveraging an on-going two-arm RCT. Participants (N=150) will be ≥18 years old, diagnosed with any type of cancer, and completed cancer treatment within the past 5 years. The 12-week intervention will be delivered viz Zoom and will consist of supervised exercise sessions twice per week. Participants will wear a Fitbit for the full duration of the intervention. PA, Physical function, and sleep data will be processed via Fitabase. Participants will complete a daily diary each night to report their fatigue. Mixed effects models will compare 24MBs on intervention days compared to non-intervention days. Age, sex, time since diagnosis, and Fitbit non-wear will be included as covariates.
ANTICIPATED RESULTS: It is hypothesized that on days when participants attend the intervention exercise sessions, they will have healthier 24MBs, increased physical function, and decreased fatigue on that same day.

P217: PERIOPERATIVE WORK IN HIP ARTHROSCOPY IS UNDERVALUED BY RELATIVE VALUE SCALE UPDATE COMMITTEE METHODOLOGY

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BACKGROUND: There has been no literature to date that has investigated whether work relative value units are underestimated for hip arthroscopy perioperative worK. The purpose of this study was to determine the accuracy of the Relative Value Update Committee and Center for Medicare and Medicaid Services current times and work relative value units for the perioperative work involved in hip arthroscopy by directly timing perioperative tasks as they occur in real time. METHODS: The Relative Value Update Committee was contacted to obtain a list of perioperative tasks and times allotted for these tasks for hip arthroscopy procedures (CPT codes 29914, 29915, 29916). A single, fellowship-trained physician recorded the time it took to perform each perioperative task. Recorded times were multiplied by their respective Center for Medicare and Medicaid Services-assigned intensity coefficient to calculate the work relative value units for preservice and post service tasks. Calculated and allotted work relative value units were compared for accuracy. RESULTS: The tasks timed in this study were allotted 83 minutes by the Relative Value Update Committee and a work relative value unit of 1.72. Our study found that these same tasks significantly differed at 93.4 minutes and total work relative value units of 1.95 ($p<0.0001$). The overall time it takes to perform perioperative tasks for hip arthroscopy is underestimated by 10.4 minutes, resulting in an undervaluation of the work relative value units by 0.23. CONCLUSION: The Relative Value Update Committee underestimates the amount of time it takes to perform perioperative tasks for hip arthroscopy procedures and thus undervalues procedure reimbursement.

P218: COUNTER MOVEMENT JUMP METRICS AND ELBOW KINETICS IN COLLEGIATE BASEBALL PITCHERS

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Background: In baseball pitching, the lower extremity is crucial in generating power. Lower body power can be assessed through a counter-movement jump (CMJ). Metrics derived from the CMJ, such as eccentric rate of force development (ECCRFD), average concentric force (AVCF) and concentric vertical impulse (CVI) have been linked to elbow injuries in baseball pitchers. This pilot study investigated the associations between CMJ metrics and elbow varus toque (EVT). **Methods:** Kinematic (240Hz) and kinetic data were collected on seven DI collegiate pitchers (19.6±2.1y, 89.5±5.6kg, 1.8±.03m). Participants performed two CMJ's, hands on hips, on a force plate (1200Hz). Following the CMJ's, participants pitched fastballs at a regulation distance. The eccentric and concentric portions of the CMJ trials were identified, and ECCRFD, AVCF, CVI were determined from each pitcher's two jump trials. EVT was time normalized between front foot contact and end of follow-through from the participant's fastest pitch. Peak EVT was also extracted. Statistical parametric mapping (SPM) regression (α=.05) was used to identify relationships between CMJ metrics and EVT throughout the pitch. For peak EVT, Pearson's correlation coefficients (α=.05) were used to identify any relationships between CMJ metrics and EVT. **Results**: Average CMJ metrics were as follows: ECCRFD (5055.8±1540.8 $N \cdot s^{-1}$), AVCF (18.3±1.2 $N \cdot kg^{-1}$), and CVI (5.3±0.4 $N \cdot s^{-1} \cdot kg^{-1}$). The ECCRFD SPM regression predicted EVT between 17-21% of the pitch ($p<.01$, $R^2=.95$). Group peak EVT averaged (4.6±0.9 $N \cdot kg^{-1} \cdot m^{-1}$). No significant correlation was found between any CMJ metrics and peak EVT (ECCRFD; r= .62, p=.14); (AVCF; r= .65, p=.12); (CVI; r= -.36, p=.43). **Conclusion:** While the ability of the model to predict EVT was significant between 17-21% of the pitch, caution should be taken when interpreting these results due to a low sample size. Nevertheless, these results warrant future research on a larger sample size to better understand the relationship between CMJ metrics and EVT.

P219: EFFECTS OF FOAM ROLLING WITH AND WITHOUT VIBRATION ON RANGE OF MOTION AND JUMP PERFORMANCE
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BACKGROUND: Vibration foam rolling (VFR) studies have used a small range of vibration frequencies to assess changes in range of motion (ROM) and performance. This study compared foam rolling (FR) and VFR at three frequencies (15 Hz, 45 Hz, 60 Hz) regarding their effects on ROM and single-leg vertical jump (SLVJ) performance. METHODS: Fifteen participants (age: 21.1±0.9 yr, height: 166.4±8.8 cm, mass: 69.6±15.9 kg) completed a familiarization and 4 experimental sessions (FR, 15 Hz, 45 Hz, and 60 Hz). Each experimental session included a warm-up, pretesting (2 sit-and-reach (SNR) attempts and 2 SLVJs), 3 x 60 s of FR or VFR over gluteals, hamstrings, and quadriceps, and post testing (same measures as pretesting). Pre- and posttest values corresponding to the best SNR and best jump height were used for analysis. Separate two-way repeated measures analysis of variance with Bonferroni post hoc tests were used to analyze SNR and SLVJ data. RESULTS: SNR increased across time for all sessions (FR: 36.9±6.7 cm vs. 39.3±6.4 cm, 15 Hz: 35.5±7.0 cm vs. 38.5±6.6 cm, 45 Hz: 36.2±7.1 cm vs. 39.4±6.4 cm, 60 Hz: 36.1±6.8 cm vs. 39.1±6.3 cm, p<0.001). There were no differences across sessions or time for peak force (FR: 1303.6±271.3 N vs. 1284.8±310.2 N, 15Hz: 1328.6±346.4 N vs. 1336.6±337.6 N, 45 Hz: 1331.7±322.9 N vs. 1318.6± 337.3 N, 60 Hz: 1312.0±332.4 N vs. 1296.7±307.0 N, p>0.05), jump height (FR: 11.8±4.9 cm vs. 11.2±4.6 cm, 15 Hz: 11.6±5.0 cm vs. 11.8±4.7 cm, 45 Hz: 12.1±4.4 cm vs. 11.9±4.8 cm, 60 Hz: 13.1±5.8 cm vs. 11.7±5.4 cm, p>0.05), braking impulse (FR: 50.6±18.6 Ns vs. 51.9±18.7 Ns, 15 Hz: 48.1±20.6 Ns vs. 49.3±19.2 Ns, 45 Hz: 49.1±19.8 Ns vs. 54.9±20.4 Ns, 60 Hz: 53.4±22.2 Ns vs. 50.4±18.6 Ns, p>0.05), or propulsive impulse (FR: 104.0±31.8 Ns vs. 102.3±31.1 Ns, 15 Hz: 104.8±35.9 Ns vs. 108.1±40.6 Ns, 45 Hz: 105.4±29.7 Ns vs. 104.6±29.9 Ns, 60 Hz: 109.4±34.6 Ns vs. 105.6±32.3 Ns, p>0.05). Peak power (FR: 1780.7±530.6 W vs. 1709.0±545.0 W, 15 Hz: 1763.3±577.6 W vs. 1760.4±547.6 W, 45 Hz: 1794.11±530.7 W vs. 1756.7±559.8 W, 60 Hz: 1841.5±607.6 W, p=0.015) and reactive strength index modified (FR: 0.16±0.07 vs. 0.15±0.07, 15 Hz: 0.17±0.08 vs. 0.17±0.07, 45 Hz: 0.16±0.06 vs. 0.16±0.06, 60 Hz: 0.18±0.08 vs. 0.16±0.08, p=0.049) decreased across time for all sessions. CONCLUSIONS: Adding vibration to foam rolling does not affect ROM or SLVJ performance.

P220: DIFFERENCES IN HITTING KINEMATICS BETWEEN BASEBALL HITTERS WITH ABOVE AND BELOW AVERAGE EXIT VELOCITY
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BACKGROUND: It is theorized that baseball hitters with higher exit velocities (EV), a common measure of hitting performance, may display superior swing mechanics compared to those with lower EV, leading to unique biomechanical patterns separating above and below average hitters. This study aimed to explore how hitting kinematics differ between players with above-average versus below-average EV. **METHODS:** Data for this study were sourced from The Open Biomechanics Project, conducted by Driveline Baseball. Players hit 4-9 swings, recorded using a K-motion hitting vest and high-speed cameras with 55 markers to capture hitting kinematics. Each player's highest EV swing was analyzed (n=97). The metrics examined included: EV (mph), bat speed at contact (mph) in the X-axis, sweet-spot velocity at contact (mph) in the X-axis, attack angle (°) in the X-axis, and pelvis angles (°) at key moments—first movement (FM), foot plant (FP), and heel strike (HS)—in the X, Y, and Z-axes. Torso angles (°) at FM, FP, and HS were also tracked across all axes. Based on the sample's average EV, swings were categorized into above-average (n=59) or below-average EV (n=38) samples. Independent sample t-tests examined differences for all metrics between above and below-average EV samples. **RESULTS:** Above-average EV hitters demonstrated significantly greater bat speed (mph) (p<0.001) and sweet-spot velocity (mph) at ball contact in the X-axis (p<0.001), and significantly lower pelvis angle (°) at FM in the Y-axis (p=0.042) than below-average EV hitters. **CONCLUSIONS:** This comparison of hitters based on EV indicates that faster swings, as assessed by both bat speed and sweet-spot velocity, and lower pelvis angles at the FM may have a greater impact on above-average EV. The minimal difference in hitting biomechanics suggest that targeted improvements in strength and conditioning, particularly focusing on enhancing strength and power, should yield improvements in EV and subsequent hitting performance.

P221: THE EFFECTS OF AEROBIC FITNESS ON BILATERAL TRANSFER IN YOUNG ADULTS
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BACKGROUND: Research shows that motor skill transfer between limbs in younger adults is often asymmetrical, with more significant improvements observed in the non-dominant limb after practice with the dominant limb than vice versa. This asymmetry is attributed to lateralized hemispheric control of movement parameters. In young adults, lateralized control occurs irrespective of aerobic fitness level. However, acute exercise has been shown to influence bilateral transfer. Previous research indicates that low reported physical activity exhibits symmetrical transfer, suggesting a loss of lateralized control. This loss is similarly observed in sedentary older adults. Nonetheless, transfer ability has not been assessed in relation to aerobic fitness. The purpose of this proposed study is to examine the effects of aerobic fitness on bilateral transfer in young adults. METHODS: Fifty young right-handed participants (18-30) will be grouped by aerobic fitness level and randomly assigned a training limb. Prior to training, aerobic fitness and handedness will be determined via the 2-minute walk test and the Edinburgh Handedness Inventory, respectively. Individuals will then perform a 30° visual rotation drawing task assessing movement parameters. Pre-test of two trials with each limb will establish baseline performance, followed by 40 practice trials on the randomly assigned limb. Post-tests mirror pre-tests assessing the transfer of motor planning parameters including movement time, normalized jerk, trajectory length, and initial direction error. ANTICIPATED RESULTS: It is hypothesized that high aerobic fitness will show asymmetrical bilateral transfer of movement parameters compared to those with low aerobic fitness.

P223: ATHLETIC MONSTERS: ANTHROPOMETRIC FACTORS OF STRONGMEN
Logan Melton, Robyn York, Jarrett Walbolt. *Montreat College, Montreat, NC.*

BACKGROUND: Strongman athletes participate in abstract, functional lifting and physical tasks to test strength, power, and muscular endurance. Though power and Olympic lifting studies have shown correlations between the biomechanics of lifters and their performance, few studies have investigated strongman athletes. The purpose of this study was to determine if there are anthropometric advantages within strongman events. **METHODS:** Eighteen resistance trained men and women ranging from 18-50 years old were recruited for this study. Height, weight, wingspan, and leg length were measured. Participants were split into 3 weight classes, then completed 5 different strongman events: medicine ball toss, overhead press, deadlift, load race, and farmer's carry hold. A bivariate correlation was used to determine any correlations. **RESULTS:** Correlations were found within specific weight classes. In the lightweight division, leg length and deadlift performance each correlated with overhead press performance (r=-0.817, p=0.047; r=0.975, p=0.001). Weight was found to correlate with overhead press performance (r=-0.854, p=0.030) in the moderate group. The heavyweight division demonstrated significant correlation between deadlift performance and farmers' carry hold (r=0.765, p=0.045) and load race (r=-0.905, p=0.005). For all participants within their weight class, the medicine ball toss was found to significantly correlate with height (r=0.640, p=0.003), weight (r=0.486, p=0.035), and wingspan (r=0.543, p=0.016). **CONCLUSIONS:** When looking at individual weight classes, anthropometric correlations were only found in the lightweight division between leg length and overhead press. However, when weight class was ignored, this study demonstrated that height and wingspan correlated with the medicine ball toss, which can be explained as the taller and longer a limb length is, the closer one is to the height of the net the ball needed to be tossed over. Further research on a larger participant pool should be conducted to determine if these anthropometric characteristics continue to correlate with enhanced performance of these events.

P224: THE EFFECTS OF AEROBIC FITNESS ON BILATERAL TRANSFER IN OLDER ADULTS

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BACKGROUND: Transfer between limbs in older adults is typically symmetrical, with similar changes in the non-dominant limb following practice with the dominant limb and vice versa. This symmetry is caused by compensatory ipsilateral hemispheric activation due to motor control deficiencies with aging. High levels of aerobic fitness have been shown to help older adults retain healthy contralateral hemispheric activation during movement control. Previous research shows that high reported physical activity exhibits asymmetrical transfer in older adults similarly to what is seen in young healthy adults. However, the effects of aerobic fitness on bilateral transfer have not been assessed. The purpose of this proposed study is to examine the effects of aerobic fitness on bilateral transfer in older adults. METHODS: Fifty young right-handed participants (65-80) will be grouped by aerobic fitness level and randomly assigned a training limb. Prior to training, aerobic fitness and handedness will be determined via the 2-minute walk test and the Edinburgh Handedness Inventory, respectively. Individuals will then perform a 30° visual rotation drawing task assessing movement parameters. Pre-test of two trials with each limb will establish baseline performance, followed by 40 practice trials on the randomly assigned limb. Post-tests mirror pre-tests assessing the transfer of motor planning parameters including movement time, normalized jerk, trajectory length, and initial direction error. ANTICIPATED RESULTS: It is hypothesized that high aerobic fitness will show asymmetric bilateral transfer of movement parameters compared to those with low aerobic fitness.

P225: IMPACT OF OBESITY ON PERCENT VOLUNTARY ACTIVATION IN WOMEN

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BACKGROUND: Obesity prevalence among U.S. adults is over 40%. Previous research has suggested obesity may impair motor performance, which may be attributed to reductions in skeletal muscle activation. However, these studies are largely limited to youth and adult men. Thus, the purpose of this study was to examine the impact of obesity on percent voluntary activation (%VA) in women. **METHODS:** Thirty-eight young (age: 21.6±3.0 yrs) women were categorized into normal weight (NW) and obese (OB) physical activity (PA) matched groups by BMI (NW: n=20, BMI=21.8±2.0 kg/m^2; OB: n=18; BMI=33.6±4.1 kg/m^2) and percent body fat (%BF) (NW: n=19, %BF=22.7±6.5%; OB: n=19, %BF=44.1±6.6%). Participant PA (average daily zone min) was determined using a commercially available activity tracker for seven days. All participants visited the laboratory fasted (4 hrs) during their follicular menstrual cycle phase and had their %BF and %VA assessed. Participant %BF was determined using a four-compartment model involving dual x-ray absorptiometry and bioelectrical impedance. Following a warm-up of three submaximal isometric leg extension (70º of flexion) contractions, participants performed three maximal voluntary contractions (MVC) using the twitch interpolation procedure to assess %VA of their dominant limb. Doublets were administered during the MVC plateau (superimposed twitch) and again after the MVC at rest (potentiated twitch) to determine %VA using the following equation: %VA=[1-(superimposed twitch/potentiated twitch)]*100. Independent samples *t*-tests and effect sizes (Cohen's *d*) were used to examine potential group differences. **RESULTS:** There were no significant differences in PA between groups when categorized by BMI (*P*=0.423; NW=43.0±30.2 min; OB=52.3±39.7 min) or %BF (*P*=0.853; NW=46.2±28.6 min; OB=48.4±41.0 min). When categorized by BMI, the NW women (83.8±8.9%) had a significantly greater %VA *(P*=0.040; *d*=0.691) than the OB women (77.3±9.8%). When categorized by %BF, similar non-significant differences (*P*=0.051; *d*=0.655) were found between groups (NW=83.8±77.7%; OB=77.7±9.8%). **CONCLUSIONS:** The findings of this study indicate that obesity impairs %VA of the leg extensor muscles in young women.

P226: THE EFFECTS OF NIKE HYPERVENOM X INDOOR SOCCER SHOES ON POSTURAL STABILITY AND BALANCE

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BACKGROUND: The modified clinical test of sensory integration in balance (mCTSIB) and the limits of stability (LOS) test assess postural control and stability, helping identify potential lower extremity injury risks, which may inform athletic shoe design. This study evaluated the effects of two types of athletic footwear on LOS and mCTSIB. **METHODS:** Twenty healthy participants [12 male, 8 female; age: 20.95 $\pm$ 0.96 years] completed the LOS and mCTSIB tests on the BTrackS™ balance platform. LOS involves leaning in four directions [front left (FL), back left (BL), back right (BR), front right (FR)] while the mCTSIB involves 4 balance conditions [eyes open (EO), eyes closed (EC), eyes open foam surface (EOF), and eyes closed foam surface (ECF)]. Both tests were completed in each footwear condition [barefoot (BF), Nike Hypervenom X shoe with built-in compression sock (S) or with no sock (NS)] assigned in counterbalanced order. Center of pressure (COP) area was assessed for LOS, and COP path length was assessed for the mCTSIB tests. For the LOS a 3 (shoe condition) x 4 (direction) repeated measures ANOVA was conducted, and for the mCTSIB a 3 (footwear condition) x 4 (balance conditions) repeated measures ANOVA was conducted, both with an alpha level of 0.05. **RESULTS:** Significant main effects for the LOS were found for footwear ($p=0.013$) and direction ($p<0.001$). Greater LOS was observed in BF and NS compared to the S (BF: $p=0.023$; NS: $p=0.035$). A significant interaction between footwear and balance condition was noted ($p<0.001$) for the mCTSIB. Post hoc comparisons revealed that during ECF trials, NS ($p=0.04$) and S ($p<0.001$) caused greater postural stability compared to BF conditions. **CONCLUSIONS:** For the LOS, the greater COP area for the BF and NS condition indicate the compression may negatively affect LOS in healthy individuals. For the mCTSIB, the findings indicate that when other sensory systems are manipulated, athletic footwear may aid to improve postural control.

P227: DIFFERENCES IN JUMP HEIGHT ACROSS TIME AFTER WEARING MINIMALIST FOOTWEAR

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BACKGROUND: Transitioning from rigid, cushioned footwear to minimalist shoes can induce significant adaptations in the foot and lower leg musculature, potentially influencing various movement patterns. One such movement is the vertical jump, a commonly used test of lower limb power and coordination. The aim of this study was to evaluate the impact of minimalist footwear habituation on jump performance. METHODS: 14 participants were fitted Vivobarefoot (Vivobarefoot Primus Lite III) to wear for 8 weeks. Vertical jump heights were obtained at day 0, day 28, and day 56, under two conditions: wearing Vivobarefoot shoes and wearing their typical shoes. A linear mixed effects model was fitted to account for participants variability, with normalized jump height as the outcome variable; shoe condition, visit, and sex as the fixed effects, and participant as the random effect. RESULTS: Results revealed that the participants normalized jump heights in their typical shoes were significantly lower during their last visit compared to the baseline visit performance ($p = .045$). Males jumped significantly higher than females ($p < .01$). Normalized jump heights in the Vivobarefoot shoes did not significantly change over the 8-week habituation period, but there was an upward trend in the data. CONCLUSION: Habituating to the Vivobarefoot shoes over eight weeks may have disrupted the participants' typical foot-shoe connection, while simultaneously improving the foot-shoe connection with the Vivobarefoot shoes. This disconnect could have created the decrease of the typical shoe performance and slight increase of the Vivobarefoot performance shown in the results. Future studies will investigate whether these effects are exaggerated when analyzing a participant wearing the shoes for a longer period of time.

P228: VERTICAL JUMP AND HOP PERFORMANCE IN PROFESSIONAL SOCCER PLAYERS WITH AND WITHOUT ANKLE ASYMMETRIES

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BACKGROUND**:** Within soccer athletes, talocrural dorsiflexion range of motion (DFROM) has been shown as a risk factor for lower extremity injuries due to the necessary range of motion required for rapid jumping and cutting movements required in the sport. Further, bilateral asymmetries in DFROM may present a higher risk than reduced DFROM alone. Vertical jump and single leg hop tests have been previously recommended for use in identifying asymmetries linked to an increase in knee injuries and post-injury prognosis. However, it is unknown how DFROM asymmetries may affect these common screening tests. Thus, the purpose of this study was to examine the differences between those with and without DFROM asymmetries on hop and VJ assessments. METHODS**:** 23 male United Soccer League players were tested for bilateral DFROM in cm at preseason using the Weight Bearing Lunge Test, and an asymmetry was defined as ≥2cm between limbs. Hop testing consisted of bilateral single hop for distance (cm), triple hop for distance (cm), and 6-meter timed hop (s). VJ testing consisted of bilateral and unilateral countermovement jumps (in) using a jump mat. Max height and distance were calculated for VJ trials and distance hops, respectively. Fastest times were used in the analysis for timed hops. Statistical differences between groups were assessed with independent t-tests with significance set a priori at p≤0.05. RESULTS**:** Significant group differences were found for bilateral VJ testing in average height ($t(21) = -2.6$, $p = 0.017$ [with asymmetry = 21.7 ± 2.9 in, without asymmetry = 25.2 ± 2.7 in]), as well as max height ($t(21) = -2.5$, $p = 0.019$ [with asymmetry = 22.3 ± 3.1 in, without asymmetry = 25.7 ± 2.8 in]). No significant differences were found for unilateral VJ testing or hop testing (all $p > 0.05$). CONCLUSIONS**:** Results from the current study suggest that professional soccer players with an asymmetry of 2cm or greater in DFROM may have decreased bilateral VJ height, but not unilateral VJ or single leg hop test performance. These results suggest that DFROM asymmetries may affect performance on tasks that require power and coordination from both limbs to produce vertical motion, as opposed to single limb tasks.

P229: PROFESSIONAL SOCCER DORSIFLEXION RANGE OF MOTION AND HOP PERFORMANCE

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BACKGROUND**:** Lower extremity injury screening is a common and crucial tool in soccer athletes due to the intermittent intensity of the sport, rapid changes of direction, jumping, landing, and cutting maneuvers players must exhibit. Examinations of talocrural dorsiflexion range of motion (DFROM) and unilateral hop tests are typical tests used to assess ankle and knee injury risk, respectively. However, it is unknown how these tests relate to each other and if both types are necessary in a testing battery. Thus, the purpose of this study was to examine the relationship between DFROM and unilateral hop test performance at preseason. METHODS**:** 23 male United Soccer League players were tested for bilateral DFROM in cm at preseason using the Weight Bearing Lunge Test. Hop testing consisted of single leg single hop for distance (cm), triple hop for distance (cm), and 6-meter timed hop (s) per limb. Maximum distance from three trials were calculated for the distance hop tests. Fastest times from three trials were used in the analysis for timed hops. Statistical relationships were assessed using bivariate correlations with significance set a priori at $p \leq 0.05$. RESULTS**:** Bivariate correlation results revealed no statistically significant relationships between DFROM of either limb with any of the hop tests conducted (all $p > 0.05$). CONCLUSIONS**:** The results from the current study suggest that there are no relationships between DFROM and hop test performance in professional soccer players. These observations provide further evidence to support the importance of including multiple assessments of lower extremity function when screening for potential injury risk. While decreased DFROM and limb asymmetries in hop test performance have been shown as risk factors for lower extremity injuries, some literature suggests DFROM more specifically assesses risk of future foot/ankle injuries in the season, and hop tests more specifically assess risk of future knee injuries and prognosis after ACL repair. Our current results indicate that these tests do not necessarily translate across the lower extremity and that a testing battery for injury screening in elite soccer athletes should include both assessments.

P230: SNAPPING HIP SYNDROME AND GLUTEUS MAXIMUS STIFFNESS

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BACKGROUND: Snapping hip syndrome (SHS), is a common injury among dancers, characterized by either a palpable or audible snapping sensation that is heard during the movement of the hip joint. It can either be internal or external. Internal snapping hip is mostly due to the iliopsoas tendon snapping over underlying bony prominences. External snapping hip is mostly due to the iliotibial band moving over the greater trochanter of the femoral head. Snapping hip of any kind results from the affected tendon tightening and snapping over the bony prominence during hip movement. This study will focus on external SHS. SHS experienced in young dancers is due to a tendon passing over the greater trochanter causing the snapping sensation. The tensor fascia latae (TFL) and gluteus maximus (GM) insert into the iliotibial tract anteriorly and posteriorly, respectively. These muscles pull on the iliotibial tract and tighten it when the hip is flexed or extended, which could be a contributing factor in the development of SHS. This study aims to determine how GM tightness and TFL tightness contribute to SHS. METHODS: I plan to recruit at least 15 female dancers from ECUs dance program. Shear wave elastography will be used to determine the stiffness of the GM, TFL, and iliotibial band (ITB). Multiple resting images will be taken of each of these muscles. Data will be analyzed by taking an average of the images and creating linear regressions to determine the correlation between GM stiffness and ITB stiffness as well as TFL stiffness and ITB stiffness. ANTICIPATED RESULTS: It is hypothesized that the stiffer the GM and TFL, the stiffer the ITB will be. SHS affects about 90% of competitive dancers with 80% having bilateral involvement. If GM and TFL stiffness affect the stiffness of the ITB, this can be predictor of whether a dancer is beginning to develop SHS. This information will be beneficial for prevention of a syndrome affecting many dancers.

P231: Unilateral Versus Bilateral Resistance Training For Vertical Jump Ability in Basketball Players

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BACKGROUND: Vertical jumping ability is a great predictor of basketball performance. It has yet to be determined if single or double leg Romanian deadlift (RDL) is better for vertical jump development. Single leg RDL improves stability and balance while focusing more on the posterior chain, which can result in better vertical jump performance. Double leg RDLs offer a more secure base, which facilitates the lifting of larger loads. The purpose of this study is to determine whether single or double leg RDLs are better for vertical jump development.**METHODS**: Ten collegiate men's basketball players were recruited for this study. Vertical jump height was measured at baseline using a Vertec. Subjects were randomized into three training groups, performing 4-5 prescribed workouts per week for 7 weeks. Group one (SIN) will be prescribed single leg RDL workouts in addition to their regular weight routine. Group two (DOU) was prescribed a double leg RDL workout amidst their regular weight routine. Group three was a control group (CON) that was told to perform their regular workout routine with no RDLs included. Vertical jumps was measured again at the end of the seven weeks. A paired t-test was used to determine differences between groups. **RESULTS**: Regardless of group, participants increased their vertical jump height at the end of the seven weeks (26.9 to 28.3in, $p > 0.001$). No significant difference was found between SIN, DOU, or CON for change in vertical jump over 7 weeks (1.7, 1.0, and 1.4in; respectively, $p = 0.132$). **CONCLUSIONS**: Strength training in general improves vertical jump height. Whether single or double leg RDLs are used may not matter. More research could help determine a better protocol for improving basketball performance.

P232: A MODEL FOR PREDICTING JOINT PAIN IN OTHERWISE HEALTHY COLLEGE STUDENTS

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BACKGROUND: Joint health is known as a prevalent issue in older adults, but recent research has expressed a trend in otherwise healthy college students experiencing joint pain. Plausible reasons for the increase in joint pain among college students could be attributed to prolonged periods of maintaining poor posture when studying or in class, or a low physical activity lifestyle due to circumstantial stressors that college students endure. Joint pain potentially stems from joint weakness, joint stiffness or overall loss of function. Joint stiffness may affect joint mobility which contributes to overall joint function. Weakness in joints might contribute to muscular compensation in gait or posture and can potentially contribute to an increase in joint pain. Identifying possible mechanisms that cause joint pain, stiffness, weakness, or loss of function potentially benefits college students who have access to campus resources unavailable to the public. METHODS: University officials distributed an email invitation to complete the online researcher-developed Joint Health Survey to all 18,086 enrolled students. Participants were invited to volunteer for a Functional Movement Screen (FMS). One hundred sixty-nine students (0.93%) who had not previously participated in the study submitted the survey, and 24 (14.2% of respondents) volunteered for FMS. A decision tree was used to determine the presence of a predictive relationship between variables. Eighty percent of the data was used to train the decision tree; the remaining data was used to test the model's accuracy. RESULTS: A model emerged in which participants with joint pain (n=103) reported weakness in joints (n=65, 64%, p=0.57), a change in function (n=33, 52%, p=0.33), and change in the ease to move their joints (n=13, 42%, p=0.23). The decision tree model correctly predicted the results for 88% of the testing data. In this small sample, no relationship was observed between subjective movement experiences as were captured by the survey and FMS scores. CONCLUSIONS: Otherwise healthy college students who report joint pain in the absence of injury may first experience joint weakness, changes in function, and changes in the ease with which they move their joints.

P233: ARE BIA RAW VARIABLES ASSOCIATED WITH MOTOR PERFORMANCE IN ADULTS WITH DOWN SYNDROME?

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BACKGROUND: Adults with Down syndrome (DS) have reduced muscle mass and muscle cell integrity that may contribute to their low muscular performance. Bioelectrical Impedance Analysis (BIA) raw variables indicative of muscle mass and cellular integrity may thus be associated with muscular performance in adults with DS, and associations may be influenced by sex. **PURPOSE:** To examine if BIA raw variables are associated with muscular performance in adults with DS controlling for sex. **METHODS**: 17 adults with DS (9 women; age 24 ± 4 years) underwent measurements of single frequency BIA at 50 kHz (Biodynamics BIA 450), Handgrip Strength (HG), Timed Up and Go (TUG) and 30s Sit-to-Stand (ST) tests. We derived BIA variables indicative of muscle mass (resistance and bioimpedance index calculated as height^2/resistance) and indicative of muscle cell integrity (reactance and phase angle). Pearson correlation coefficients (r) between BIA raw variables and motor performance were examined, and General Linear Models (GLM) were used to examine sex effects on correlations. **RESULTS**: Bioimpedance index and resistance had significant moderate associations with HG (r = 0.62 and -0.60; $p \geq$ 0.011, respectively. Conversely, phase angle and reactance were not significantly associated with HG (r = 0.37 and -0.27; $p \geq$ 0.15). BIA raw variables were not significantly associated with ST (bioimpedance index: r = -0.24; phase angle: r = -0.11; resistance: r = -0.04; and reactance: r = -0.11; $p \geq$ 0.34) and TUG (bioimpedance index: r = 0.12; phase angle: r = 0.17; resistance: r = 0.03; and reactance: r = 0.16; $p \geq$ 0.50). Sex did not affect any of the associations (GLM $p \geq$ 0.09). **CONCLUSIONS**: Bioimpedance index and resistance are associated with HG in adults with DS independent of sex. Reduced muscular performance may reflect lower muscle mass and not muscle cell integrity in adults with DS.

P234: EFFECT OF PERCUSSION THERAPY ON CONTRACTILE PROPERTIES OF THE GASTROCNEMIUS AND VASTUS MEDIALIS MUSCLES

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PURPOSE: Percussion therapy (PT) is a popular self-myofascial release therapy to limit post-exercise muscle soreness and discomfort. The present study assessed the effect of short-term PT on muscle contractile properties in the vastus lateralis (VL) and gastrocnemius lateralis (GL) muscles in both young and older subjects. METHODS: Participants (n=18) were separated into older (n=8, 21.00y ±1.944) and young (n=10, 51.12y ±8.59) subject groups. All subjects underwent 3-minute PT sessions (Theragun Pro, Therabody) for the VL and GL muscles. Consistent vibration massage, set at 1900Hz, was used for all subjects. Before (PRE) and 10 minutes after (POST) therapy, muscle contractile properties were assessed using tensiomyography (TMG-BMC, Ljubljana, Slovenia). A 1ms electrical stimulus was induced through two self-adhesive electrodes to obtain a maximal muscle mechanical response - measured by a digital transducer (Trans-TekR GK 40, Ljubljana, Slovenia). Participants remained lying in the supine position for VL measurements and in the prone position for GL measurements. Contractile time (Tc), muscle radial displacement (Dm), and the time required for stimulus-initiated muscle contraction (Td) were measured. RESULTS: A two-way, mixed ANOVA revealed no significant interaction between groups over time in all VL and GL variables. Dm in VL was significantly increased ($p<0.05$) in the older (PRE: 4.76mm ±1.26, POST: 5.53mm ±1.43) and younger (PRE: 5.07mm ±1.64, POST: 6.07mm ±1.93) groups. Tc in the GL was significantly increased ($p<0.05$) in the in the older (PRE: 19.41ms ±3.75, POST: 20.67ms ±4.74) and younger (PRE: 16.61ms ±1.49, POST: 17.82ms ±2.01) groups. CONCLUSION: Percussive therapy improved muscle displacement (DM) In the VL muscle, with differing responses in GL between Y and O subjects. DISCUSSION: Immediate use of PT improves muscle displacement, perhaps by increased tissue elasticity. However, contractile speed may be hindered, at least in the short-term, following PT.

P235: THE EFFECT OF SLEEP CHARACTERISTICS ON THE ARTERIAL STIFFENING RESPONSE FROM SITTING

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BACKGROUND: Approximately 33% of U.S. adults experience poor sleep, which is linked to elevated arterial stiffness (AS), an indicator of cardiovascular disease risk. Poor sleep may modify AS response to prolonged sitting, known to acutely increase AS. Movement breaks have been shown to reduce this effect. This study aims to determine 1) which measures of poor sleep impact baseline pulse wave velocity (PWV) and 2) whether these characteristics affect AS response to uninterrupted and interrupted prolonged sitting. METHODS: The sample includes 35 men and women (36-55 y) who are sedentary (sitting ≥8 hr/day) and physically inactive (exercise <90 min/wk). Data was obtained from an R01 clinical trial (SWITCH). Each participant completed four 4-hour prolonged sitting conditions: (1) hourly five-min walking breaks; (2) hourly 15-min standing breaks; (3) alternating five-min walking and 15-min standing breaks, each once/hr; and (4) no breaks (control). Participants used a SleepScore Max to track their sleep metrics (WASO; sleep latency; REM sleep time) two nights prior to each visit. The primary outcome, PWV (gold standard for measuring AS) was measured with a Vicorder (SMT Medical) device. For Aim 1, a linear mixed model with random effects will assess the contributions of sleep factors to PWV. For Aim 2, significant criteria from Aim 1 will categorize sleep as poor or good (e.g. WASO <20 min total, sleep latency ≤30 min, and 21-30% REM sleep). The change in PWV from pre- to post-measures of each condition will be analyzed to see how poor or good sleep affects AS response during uninterrupted and interrupted sitting. ANTICIPATED RESULTS: We hypothesize WASO and sleep latency will most impact PWV, and poor sleep will further increase AS response to prolonged uninterrupted sitting. If sleep amplifies AS response, those unable to take movement breaks should prioritize good sleep, while increased movement may help poor sleepers. This study could inform future research on sleep and sitting.

P236: IMPACT OF FLUID RESTRICTION ON PULMONARY FUNCTION DURING EXERCISE

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BACKGROUND: Previous work suggests that resting pulmonary function is impaired by mild dehydration through the collapse of small/unsupported airways, but nothing is known about how fluid balance impacts pulmonary function during exercise. Therefore, the aim of this study was to determine the effect of fluid restriction on the presence of expiratory flow limitation (EFL) and pulmonary dynamics during exercise. **METHODS:** Twelve active adults (8 M; 4 F) aged 20 ± 2 years performed a VO_{2Peak} test on a cycle ergometer during one preliminary and two experimental trials. The euhydrated (HYD) and fluid restricted (FR) experimental trials were performed in a randomly counterbalanced order. For FR, participants were instructed to avoid fluid intake as well as any food with >30% water content for 24 hrs prior to exercise. For HYD, subjects ingested fluid ad libitum along with 473mL of water the night before- and again the morning of the trial. Maximum flow-volume loops were performed before and after exercise with inspiratory capacity maneuvers executed during exercise. **RESULTS:** Hydration status had no apparent effect on the presence of EFL or operating lung volumes. However, post-exercise forced vital capacity (FR: 4.9 ± 1.0 vs. HYD: 4.5 ± 1.1 L) and peak expiratory flow (PEF) (FR: 9.7 ± 1.9 vs. HYD: 8.9 ± 1.6 L/sec) were lower ($p<0.05$) in FR compared to HYD. Additionally, at the highest common workload reached by all participants (150 W), tidal volume (VT) was lower in FR (1.93 ± 0.26 vs. 2.20 ± 0.3 L), while respiratory rate (RR) was elevated in FR (45.6 ± 8.5 vs. 34.4 ± 0.4 breaths/min). **CONCLUSIONS:** Hydration status had no impact on EFL presence and severity or operating lung volumes. However, the reduction in VT and increase in RR along with the attenuation of post-exercise FVC and PEF suggest that small airways were impacted by condition. It is worth noting that the 24-hr fluid restriction protocol led to relatively small changes in hydration levels, and when coupled with the observations described herein, indicates that more marked dehydration could have appreciable consequences for pulmonary physiology and physical performance outcomes.

P237: PROTEOMIC SIGNATURE OF HIGH AND LOW VO_2PEAK RESPONSE TO EXERCISE TRAINING IN CHRONIC HEART FAILURE

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Introduction. One of the primary symptoms in heart failure (HF) is severe exercise intolerance reflected by reduced VO_2peak. Although VO_2 peak tends to increase on average with exercise training in HF patients, there is large inter-individual variability in VO_2 peak response. In this pilot study, we investigated the plasma proteomic signature of low and high responders of VO_2peak to exercise training in patients with chronic systolic HF. **Methods**. Two subgroups of chronic systolic heart failure patients, matched for age, sex and race, were selected on the extreme tails of VO_2 peak response to 3 months of endurance training (20 high responders, mean change VO_2peak= +4.7 mL/kg/min; 20 low responders, mean change VO_2peak= -1.6 mL/kg/min) in the HF-ACTION randomized trial. Baseline proteomic profiling was performed using the Olink Explore 3072 platform that utilizes antibody-based proximity extension assays. Student t-tests were used to identify differential protein expression between high and low VO_2 peak responders. Partial least squares discriminant analysis (PLS-DA) with leave one out cross-validation was used to classify VO_2 peak response status using proteins, clinical variables, and a combination of both. **Results**. Baseline VO_2 peak did not differ between the high and low VO_2 responder groups. The baseline levels of 15 proteins, including the blood group protein ABO and immune proteins interleukin 1A, and Synaptotagmin-1, were nominally different ($p<0.05$) between the high and low VO_2 peak responder groups. A protein only classification model utilizing these 15 proteins achieved 0.87 accuracy. A model including only clinical variables achieved an accuracy of 0.42, while adding clinical variables to the protein model resulted in an accuracy of 0.72. **Conclusion.** Our pilot study shows that baseline protein levels may hold promise for the prediction of VO_2 peak training response in HF patients. But further studies are needed to validate and expand these findings in the larger HF-ACTION study, as well as in an external cohorts and other proteomic and omics platforms.

P238: THE EFFECT OF MODIFYING ARTERIAL COMPLIANCE ON MEASURES OF ARTERIAL OCCLUSION PRESSURE

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BACKGROUND: Many studies have been conducted attempting to clarify the morphological and physiological contributions to an individual's arterial occlusion pressure (AOP), the minimum pressure required for a given pneumatic cuff to fully occlude arterial blood flow into a limb. Last year, our laboratory reported that pulse wave velocity (PWV), an indirect measure of arterial compliance, explained a significant amount of variance in AOP. It has been shown that inflating and deflating a cuff on a limb can acutely increase arterial compliance. The purpose of this study is to determine whether acute changes in arterial compliance result in measurable changes in AOP. METHODS: Forty-five (men=15) participants visited the laboratory on one occasion. Participants were randomized, in a counterbalanced manner, into either the intervention or control group. Following anthropometric measurements, blood pressure was recorded following 15 minutes of supine rest. Resting AOP in the arm was measured using a 5cm wide inelastic cuff and vascular doppler. Participants in the control group rested supine for an additional 10 minutes. Participants in the intervention group received 6 sets of 12 inflation/deflation cycles in the arm at 100% of AOP, 4 seconds inflated and 2 seconds deflated, and 30 seconds of rest between sets. This protocol has been shown to increase arterial compliance. AOP was measured again following either the intervention or the additional rest. Data was analyzed using repeated-measures ANOVA. RESULTS: There was no statistically significant group by time interaction (P = .586). There was a statistically significant effect of time, with AOP decreasing from the first to second measure (-2.0 (-3.2 - -0.7) mmHg, P = .002). CONCLUSIONS: Using a protocol that has been shown to increase arterial compliance, there was no statistically significant effect on the AOP measurement. It could be that the contribution of arterial compliance to AOP is minor enough to not show in the acute measurement. AOP did decrease across both groups; this could indicate that the additional 10 minutes of supine rest allowed for further decreases in cardiovascular contributions to the AOP measurement.

P239: EFFECTS OF SHORTER BLOOD FLOW RESTRICTION CYCLES ON PERCEPTUAL AND CARDIOVASCULAR RESPONSES

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BACKGROUND: In the absence of exercise, Blood flow restriction (BFR) can mitigate losses in muscle mass and strength following immobilization. However, a typical 5-min BFR protocol has been reported as painful, which may limit adherence. The purpose of this study is to determine whether shorter and more frequent cuff inflations are a preferable alternative to the typical 5-min BFR protocol. METHODS: This is an ongoing study. Using a within-subject design, participants completed 4 visits. Visit 1 included familiarization. For visits 2-4, participants had 1 of 3 conditions applied on the dominant arm while supine: 5-min (BFR5, 5 cycles), 3-min (BFR3, 7 cycles), or 0-min (CON, 7 cycles) of cuff inflation at 80% arterial occlusion pressure (AOP). AOP was measured with an automated device, following an initial 5-min rest with the dominant arm abducted 90 degrees. Following a second 5-min rest, baseline ratings of pain and perceived discomfort were reported with separate 10-point scales. Heart rate (HR) and oxygen saturation (OSat) were measured with pulse oximetry. In the last 60 seconds of the last cuff inflation, participants reported their ratings of pain and perceived discomfort while HR and OSat were recorded. For statistical analysis, change scores (Δ, last cycle-baseline) were compared with one-way Bayesian Repeated Measures ANOVAs. Data is reported as mean±standard deviation. RESULTS: Currently, 13 participants (22±3 yr, 78.0±12.7 kg, 171.2±11.7 cm) have completed this study. ΔPain (A.U., BF_{10}= 1.949) was higher in BFR5 (1±2) than both BFR3 (1±1, BF_{10}= 1.026) and CON (0±0, BF_{10}= 1.222). CON and BFR3 were similar (BF_{10}= 0.812). ΔDiscomfort (A.U., BF_{10}= 225.332) was higher for BFR5 (2±2) than BFR3 (1±2, BF_{10}= 2.362) and CON (0±0, BF_{10}= 121.307). CON was lower than BFR3 (BF_{10}= 2.169). ΔHR (bpm, BF_{10}= 0.352) was similar across BFR5 (1±5), BFR3 (0±5), and CON (-1±5). ΔOSat (%,

BF_{10}= 8.772) was similar between BFR5 (-7±8) and BFR3 (-8±10, BF_{10}= 0.346). CON (1±2) was higher than BFR5 (BF_{10}= 4.125) and BFR3 (BF_{10}= 3.874). ΔAOP (mm Hg, BF_{10}= 0.293) was similar across BFR5 (-1±5), BFR3 (3±13), and CON (1±5). CONCLUSION: Our preliminary findings suggest that shorter cuff inflations with additional cycles may improve perceptions, and 3- or 5-min cycles elicit similar changes to the cardiovascular response.

P240: COMPARING THE EFFECT OF RELATIVE AND ABSOLUTE PRESSURES ON FLOW-MEDIATED DILATION

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BACKGROUND: Flow mediated dilation (FMD) is used to test endothelial function using the post-deflation diameter of an artery following 5 min of occlusion. However, there is no standardized pressure used in FMD. Previous studies have used pressures ranging from 200 to 300 mm Hg with a general recommendation to inflate a cuff at least 50 mm Hg above systolic blood pressure to ensure occlusion. Since these suprasystolic pressures are inconsistent, the purpose of this study is to compare the effect of the different pressures on FMD and the perceptual responses. METHODS: Using a within-subject design, 30 participants (18-64 years old) will have FMD measured over 2 visits with 2 different pressures each visit. The four conditions include 100% arterial occlusion pressure (AOP), 130% AOP, 50 mm Hg above AOP, and 250 mm Hg. A 5 cm wide cuff will be placed distal to the antecubital crest with the arm abducted (90 degrees). Participants will have 10 min of supine rest. AOP will be measured by inflating a cuff until the distal radial pulse is inaudible (100% AOP). An ultrasound probe placed proximal to the cuff, will be adjusted until the brachial artery is visible. Following a second 5 min rest, baseline values will be recorded for 2 min prior to the condition. Then, the cuff will inflate to the first pressure for 5 min. Blood velocity (cm/s) and arterial diameter (mm) will be continuously recorded using simultaneous acquisition from 30 sec pre-deflation to 5 min post-deflation. Ultrasound videos will be analyzed with Open Access Software (FloWave.US). Participants will report their perceived pain and ratings of perceived discomfort in the last 30 sec of cuff inflation. Following another 10 min rest, the second condition will begin starting with the AOP. One-way repeated measures ANOVAs will be used to compare the changes from baseline to 30 sec pre-deflation (perceived pain (A.U.) and ratings of perceived discomfort (A.U.)) and from baseline to post-deflation (peak arterial diameter (mm) and 15 sec blood velocity (cm/sec)). ANTICIPATED RESULTS: We expect that any pressure that occludes blood flow will produce a similar FMD, though lower relative pressure will be more comfortable.

P241: HEART RATE ACCURACY OF WEARABLE ACTIVITY MONITORS ACROSS THE SKIN TONE AND EXERCISE INTENSITY SPECTRUM

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BACKGROUND: Photoplethysmography (PPG) is a cost-effective heart rate (HR) assessment method used in wearable activity monitors. Briefly, a light-emitting diode on the wearable is focused onto the skin, then reflection/reflectance is leveraged to detect changes in capillary volume over time. An algorithm translates the intervals of capillary volume changes to HR (beats per minute). Currently, there is conflicting evidence about the accuracy of HR assessed by PPG across the skin tone spectrum during exercise. The purpose of this study is to assess the HR accuracy of several consumer- and research-grade wrist-worn wearable activity monitors during rest and during various intensities and modalities of exercise across the skin tone spectrum. METHODS: First, skin tone will be objectively measured by the LinkSquare Spectrometer and subjectively by the Fitzpatrick Skin Type Quiz. Next, participants will be fitted with four activity monitors (Apple Watch Series 5, Garmin Vivo Smart 4, Fitbit Charge 4, Empatica EmbracePlus) and a Polar chest strap (criterion measure). Following 5-min of rest, participants will complete treadmill walking (1.1 - 1.7 m/s), treadmill jogging (1.8 - 2.2 m/s), treadmill running (> 2.2 m/s), and arm ergometry (25 W) for 3-min, four flights of stair stepping, and 5-7-min of exercise gaming (Ring Fit Adventure - Nintendo Switch). HR will be recorded from all monitors immediately following each exercise. Summary statistics (mean, SD, pct criterion) and statistics representing bias (mean bias) and accuracy (mean absolute percent error) will be calculated. Bland Altman plots will visualize agreement between measures and linear regression will be used to determine the HR error with skin tone as a predictor. ANTICIPATED RESULTS: It is hypothesized that darker skin tones and exercise involving upper body motion will show greater HR errors than lighter skin tones. Also, less error will be found during rest and aerobic lower body exercise.

P242: CONSIDERATIONS IN ACCELEROMETRY AND CARDIOVASCULAR ASSESSMENT IN LGBTQ+ INDIVIDUALS: A PILOT STUDY

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BACKGROUND: Sexual orientation and gender identity minority populations (i.e., LGBTQ+) experience greater cardiovascular disease risk and engage in less physical activity (PA) than their cisgender, heterosexual peers. Disparities in PA participation among LGBTQ+ individuals are under-researched and may require consideration of how to accommodate and ethically study this group. This pilot study examined LGBTQ+ individuals to assess their comfort with the use of cardiovascular and accelerometer-based methodologies commonly used to acquire PA-related data. **METHODS:** Individuals identifying as LGBTQ+ were recruited from a university-based support organization. A convenience sample of 10 individuals (mean±standard deviation age: 31.5±6.4) completed arterial stiffness, heart rate variability, and blood pressure assessments. Participants also wore thigh-mounted activPAL and wrist-worn ActiGraph accelerometers. After a ten-day observation period, participants returned to the laboratory to complete scale-based measures on perceptions of using each accelerometer (e.g., comfort, ease of use). Participants also completed a semi-structured interview about all study components. Interview data were analyzed using thematic analysis. **RESULTS:** Mann-Whitney U tests did not identify differences between the accelerometer perception measures. Dominant themes from the interviews were LGBTQ+ participants' desires for: (1) Private communications on LGBTQ+ identity: participants appreciated private settings for survey and interview completion as they disclosed LGBTQ+ life experiences ; (2) Establish familiarity with research personnel: participants desire thorough communication on the purpose of each research method to reduce testing anxiety; and (3) participant control of the research protocol: afford flexibility to participants as they disclose their LGBTQ+ identity and personnel apply devices to the bodies of genderfluid and body-sensitive individuals. **CONCLUSIONS:** This pilot identified key considerations for the use of cardiovascular assessments and accelerometers with LGBTQ+ individuals. Incorporating the feedback provided by the study sample may help to ensure the comfort and retention of study participants identifying as LGBTQ+.

P243: PARA TABLE TENNIS INTENSITY: IMPLICATIONS FOR HEALTH AND REHABILITATION

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BACKGROUND: Sport provides an opportunity for individuals with mobility impairments to potentially meet physical activity intensities associated with positive health outcomes. Para Table Tennis (PTT) is a very popular activity option with limited investigations into the prospective health benefits. Therefore, the purpose of this study was to document sport intensity across varied conditions of PTT performance. METHODS: MET values and heart rate (HR) were measured in five PTT athletes with mobility impairments across 10 minutes of warm-up, drill, scrimmage, and cool-down conditions on multiple days. Mean MET and HR values for each condition were used to describe intensity level achieved. RESULTS: The sample sustained an intensity of moderate- to vigorous-intensity exercise across drill and scrimmage activity depending on sport class. As a sample, participants sustained an intensity of 8 METs across drill and scrimmage conditions with wheelchair athletes demonstrating a metabolic rate between 3 to 6 METs. HR data supported the metabolic findings with the sample's percentage of HR max averaging intensities of 60 to 65 during drill and scrimmage conditions. CONCLUSIONS: Findings in the current study support the ability of PTT to serve as anexercise stimulus which meets the guidelines for physical activity for individuals with mobility impairments.

P244: COMPARING HIV/AIDS HEALTH KNOWLEDGE AT DIFFERENT UNIVERSITIES

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BACKGROUND: Health education has been instrumental in reducing HIV infection rates; however, the Black community and college aged individuals are disproportionately affected. Thus, understanding the differences in sexual health knowledge between Historically Black Colleges and Universities (HBCUs) and Predominately White Institution (PWI) students could provide an in-depth look at any disparities that may exist. This study assessed HIV/AIDS knowledge among HBCU students and compared the findings to a previously published study at a PWI. METHODS: A total of 84 undergraduates (52% male; 96% Black) from a HBCU completed a HIV knowledge and experience survey via Qualtrics. Survey questions were based on information from the CDC's HIV webpage and previous validated HIV knowledge questionnaires. HBCU survey answers were compared to a similar study from a PWI with 315 undergraduate students (39% male, 83% White). Data analyzed via Chi-square with significance of $\alpha<0.05$. RESULTS: Both HBCU and PWI students showed similar rates of knowing someone with HIV/AIDS (17%, 26%, X2=3.2, p=0.07) and having been tested for HIV (55%, 54%, X2=0.006, p=0.94). More HBCU students (26.2%) believed HIV is curable compared to PWI students (7%, X2=24.4, p<0.01), and a higher percentage of HBCU students (49%) thought there is a vaccine for HIV compared to PWI students (11%, X2=61.1, p<0.01). Both groups largely believed that there is a treatment to improve the quality of life for those with HIV/AIDS (82%, 84%, X2=0.8, p=0.37). Both groups agreed that HIV can be transmitted through anal (81%, 88%, X2=2.8, p=0.10) or oral sex (85%, 82%, X2=0.3, p=0.58), but not through kissing (68%, 76%, X2=2.2, p=0.14). CONCLUSIONS: The study highlights two gaps in HIV knowledge among HBCU students compared to PWI students, particularly regarding the curability of HIV and the existence of a vaccine. These misconceptions may contribute to increased vulnerability to HIV infection within the Black community, as more risky behavior may occur if there is a belief of a cure or vaccine. Increased educational efforts at HBCUs should be implemented to increase awareness of HIV/AIDS.

P245: MENSTRUATION AND PERCEIVED SORENESS IN DIVISION I WOMEN'S SOCCER PLAYERS

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BACKGROUND: There is an underwhelming amount of research dedicated to how the female body responds to the stresses of athletics compared to male counterparts. Specifically, an area in need of examination is how the female athlete is influenced by the menstrual cycle. Hormonal changes stemming from menstrual cycle phase have been found to influence musculoskeletal physiology, which, in turn, may affect sports performance. Further, perception of soreness can influence athletic performance. Our study examined if menstruation influenced self-report soreness within a collegiate women's soccer population throughout their competitive season. METHODS: One Division I women's soccer team (n = 24) completed daily subjective wellness surveys throughout the 85 days of the team's Fall 2023 NCAA Championship Season. We examined two items from the survey: Are you on your menstrual cycle? Rate your level of soreness. Soreness ratings were indicated on a 1-10 scale. We analyzed soreness measures from days a participant recorded being on their menstrual cycle versus not using a Wilcoxon Signed Rank Test. RESULTS: The participants reported 1679 days when not menstruating and 286 days when they were. There was no significant difference between self-reported soreness when a participant indicated they were menstruating compared to self-reported soreness when the participant was not menstruating ($Z = -.42$; $p = .68$). CONCLUSIONS: Coaches of female athletes should be well-aware that participants can be influenced by the natural variance of hormones throughout the phases of the menstrual cycle. Females will also have individualized responses, physiologically and performance-wise, during these hormonal fluctuations. While there was no statistical significance found in the data collected for this project, being cognizant of the impact menstrual cycle phases can have physiologically and psychologically on participants can promote a more optimal training environment for the female athlete.

P246: SELF-REPORTED PERCEIVED EXERTION VALUES RELATE TO GPS-OBTAINED INDICES OF TRAINING IN COLLEGIATE MALE SOCCER PLAYERS

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BACKGROUND: Wearable global positioning system (GPS) devices are commonly used by well-funded sports teams to quantify players' training loads and intensities, to modify training for overtraining prevention, and in order to potentially reduce participation-related injuries and illnesses. Acquiring this costly technology poses a challenge for lesser-funded sports programs. This study's purpose was to determine if session rate of perceived exertion (sRPE) is an alternative method for quantifying training loads and intensities. METHODS: Twenty-one collegiate male soccer players (age=21.1±1.7 y, height=182.5±6.8 cm) consented to participate in this IRB approved study. All participants wore a GPS device for each training session and match. This device recorded participants' distance (mi), sprint distance (yd), power plays, player load, work ratio, and total session duration (min). GPS data was uploaded to an associated software program for analysis. Study participants rated the overall difficulty of each training session or match using a Modified RPE Scale administered via an online survey instrument. To calculate sRPE, each RPE value was multiplied by the training session or match duration. Pearson's Correlation Coefficient (r) and Coefficient of Determination (r^2) were calculated to determine the strength of the relationship between sRPE and each of the five GPS-obtained training indices. We categorize the strength of association as: very weak (0.0-0.2), weak (0.2-0.4), moderate (0.4-0.6), strong (0.6-0.8), or very strong (> 0.8). RESULTS: sRPE values strongly correlated with the following: power plays (r = 0.6369), distance (r = 0.6432), and player load (r = 0.6484). sRPE correlated moderately with sprint distance (r = 0.5413) and very weakly with work ratio (r = 0.1092). CONCLUSIONS: These results demonstrate sRPE data is related to GPS-obtained training indices and therefore sRPE values can be an affordable alternative for quantifying training loads, potentially minimizing injury and illness risk.

P247: THE INFLUENCE OF HIP STRENGTH OR FLEXIBILITY AND CORE ENDURANCE ON HIP MISALIGNMENT

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BACKGROUND: Many female athletes experience non-specific back pain, which is often associated with hip misalignment. Research indicates potential positive effects of exercises and stretches in reducing hip misalignment and back pain. The purpose of this study was to examine the impact of hip stretches and core endurance on hip alignment in female collegiate athletes. **METHODS:** 19 college-aged women were recruited and assigned to one of three study groups: 1) a control group that continued their typical training (CT), 2) a hip strength and flexibility group (HIP), and 3) a hip strength and flexibility, plus core strength group (COR). The visual analog scale (VAS) was used to analyze back pain. Right and left pelvic tilt and right, left, anterior, and posterior hip shift values were collected via Fit3D Body scan. Manual calculations of hip height difference (right/left) were recorded on a posture grid. All data was analyzed for potential correlation via Repeated Measures of ANOVA. **RESULTS:** Hip misalignment approached a significant increase in the CT group (-1.78cm, p=0.092), while COR approached a significant decrease in hip misalignment (1.97cm, p=0.095). HIP experienced no significant change (0.73cm, p=0.395). Results from the Fit3D Scan noted that when looking at changes between each group as time progressed, regardless of group, both HIP and COR had a significant decrease in hip tilt from baseline to post-intervention when compared to CT by the end of the study (3.11cm, $p < 0.001$ and 3.21cm, $p < 0.001$; respectively). No significant differences were observed in back pain levels between groups, though participants anecdotally reported improvements in hip and back pain. **CONCLUSION:** While no significant changes in pain were found, hip and core exercises seem to affect hip misalignment. Future research could identify better solutions for addressing back pain through exercise in college-aged women athletes.

P248: COMPARISONS OF HAMSTRINGS-TO-QUADRICEPS RATIO IN FEMALE AND MALE CHILDREN AND ADOLESCENTS ACROSS THE VELOCITY SPECTRUM

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BACKGROUND: Previous literature has suggested that females tend to have lower hamstrings-to-quadriceps ratio (HTQ) than males in adulthood, which may predispose females to greater knee injury risk. However, there is limited research examining HTQ in youth males and females. The purpose of this study was to examine HTQ across the velocity spectrum in male and female children and adolescents. **METHODS:** Seventeen children (n=9 females, age=10.74±0.89 years; n=8 males, age=10.83±0.71 years) and 22 adolescents (n=11 females, age=13.82±1.63 years; n=11 males, age=13.92±1.15 years) participated. Ultrasound images quantified quadriceps and hamstrings muscle cross-sectional area (CSA). Peak torque (PT) was taken from maximal voluntary isometric contractions (MVICs) and isokinetic leg extension and flexion contractions from 60-300°·s^{-1}. HTQ was calculated by dividing hamstrings CSA by quadriceps CSA and PT from leg flexion by PT from leg extension for all contractions. A two-way factorial analysis of variance (ANOVA) examined differences in HTQ from CSA. A mixed-factorial ANOVA examined differences in HTQ from PT.**RESULTS:** HTQ from CSA was greater for males than females collapsed across group (p=0.003). For HTQ from PT, there was a significant velocity x group interaction (p=0.022). For children, HTQ from MVIC was lower than 120, 180, and 240°s^{-1} (p<0.023), and HTQ from 60°s^{-1} was lower than 240°s^{-1} (p=0.047). For adolescents, HTQ from MVIC was lower than 60, 120, and 180°s^{-1} (p<0.012).**CONCLUSIONS:** HTQ from CSA was lower than females compared to males, which may speak to the sex-based developmental differences in muscle hypertrophy that accompanies growth and development. Children and adolescents similarly had lower HTQ during the MVIC compared to faster velocities. To optimize HTQ holistically, youth females may benefit from programs which emphasize muscle hypertrophy. Furthermore, it may be beneficial for children and adolescents to perform hamstrings strengthening exercises that focus on maximal force production across the velocity spectrum. Of note, the mean values for HTQ across velocity for all groups were below the generally recommended value of 0.67, which suggests that practitioners should design training programs with an emphasis on hamstrings strength in children and adolescents.

P249: THE IMPACT OF A LOWER BODY POSITIVIE PRESSURE TREADMILL ON EXERCISE REGULATION

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BACKGROUND: Lower body positive pressure (LBPP) treadmills have been a useful tool in rehabilitation settings, but there is little to no research on regulating exercise intensity using the rate of perceived exertion (RPE) at reduced bodyweight loads. The purpose of this study was to examine the potential for RPE-based intensity estimation at various bodyweight loads. **METHODS**: Fifteen healthy, college-aged participants completed the study. The initial visit participants completed a VO_{2max} test in which heart rate (HR), VO_2, VCO_2, respiratory exchange ratio (RER), and RPE were collected every minute. The OMNI pictorial RPE scale was utilized for all sessions. On two separate lab visits, participants completed two 5-minute submaximal tests at either 70% or 90% of body-weight (BW). Participants were blinded to the treadmill screen and asked to self-adjust the speed until they reach an RPE of 4 or 7. A one-way repeated measures analysis of variance (ANOVA) was conducted to determine the difference between VO_2, RER, and HR at 70, 90, and 100% of bodyweight at an RPE of 4 and 7. Statistical significance was set at $p \leq 0.05$. **RESULTS**: VO_2 at an RPE of 4 and 7 at 70% ($p = 0.018$; $p < 0.001$) and 90% ($p = 0.031$; $p < 0.001$) of BW were significantly lower compared to 100% BW. HR at an RPE of 4 and 7 at 70% BW ($p = 0.020$; $p = 0.009$) and RPE of 4 at 90% BW ($p = 0.039$) were significantly lower compared to 100% BW, but HR at an RPE of 7 at 90% BW ($p = 0.052$) was not statistically different. RER was significantly lower at 70% ($p = 0.006$) and 90% BW ($p = 0.019$) at an RPE of 7, but not significantly different at an RPE of 4 at 70% ($p = 0.401$) and 90% BW ($p = 0.358$). **CONCLUSIONS**: As the percentage of body weight decreased, participants' VO2, HR, RER, and velocity decreased at each RPE intensity. This suggests that participants were not able to accurately regulate exercise intensity using RPE and should be considered when prescribing exercise intensity while using a LBPP treadmill.

P250: ASSOCIATION BETWEEN TRAVEL STRESS AND PERFORMANCE OVER FIVE COMPETITIVE SEASONS IN NCAA DI WOMEN'S BASKETBALL

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BACKGROUND: Recent NCAA conference realignment will require athletes to travel greater magnitudes across multiple time zones on a more frequent basis, which could impact athletes' physical performance during competition. This study aimed to quantify the effect of time zone changes on team performance measures, such as end-game scoring margin (EGSM) and player efficiency rating (PER), over five competitive seasons, contributing to optimizing athlete performance. PURPOSE: This study quantified the effects of time zone change on physical measures of team performance in NCAA DI Women's basketball across five years of their competitive seasons. METHODS: Data was collected from a range of team performance measures, including end-game scoring margin (EGSM) and player efficiency rating (PER) across multiple time zones. Statistical analysis ($\alpha = 0.05$) focused on identifying patterns of performance variation associated with travel across one or more time zones. RESULTS: The findings demonstrated a significant, negative correlation between occurrence of time zone change ($r = -.120$, $p < .05$) and time of day ($r = -.173$, $p < .01$) and EGSM, such that games played in a different time zone or later in the day were more likely to result in a loss than games in the team's home time zone or games earlier in the day over five competitive seasons (n = 153). CONCLUSIONS: There was a negative association between time zone change and time of day on EGSM, such that travel requiring a time zone change or games played later in the day were more likely to be lost. These findings suggest that in-game basketball performance could be negatively affected by travel requiring time zone change, prompting future research on travel stress on performance in collegiate athletes.

P251: UTILITY OF MACHINE LEARNING FOR IDENTIFICATION OF ATHLETE AVAILABILITY PREDICTORS IN NCAA WOMEN'S LACROSSE

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BACKGROUND: Athlete availability (AA) is a critical, though multifactorial component in individual and team performance. This study sought to use machine learning to identify influential predictors (training load, recovery, body composition, and force plate jumps) of AA in elite female athletes. **METHODS:** Twenty-eight NCAA Division I women's lacrosse athletes (age: 20.4±1.7yrs) were tracked across a season for AA (% of unmodified, completed practices and games). Training load included seasonal means of max speed (MS; km/h), distance (D; m), high-intensity running (HIR; m≥15 km/h), and acute to chronic workload ratios (ACWR; 7 to 28 day exponentially weighted moving average) for D and HIR. Wearable smart rings captured sleep duration (s), resting heart rate (RHR; bpm), heart rate variability (ms), and deviation from the mean of bedtime start and end, and temperature. Body composition change scores (Δ; post-preseason) via total body dual energy x-ray absorptiometry for bone mineral density (BMD; g/cm^2), lean mass (LM; kg), fat-free mass index (kg/m^2), and percent body fat (BF%; %) were included. Force plate metrics included reactive strength index modified, eccentric mean braking (N), jump height (cm), and peak power (W). Influential predictors were identified using elastic net regression with the minimum mean cross-validated error penalty parameter λ. **RESULTS:** The most influential variables on AA included: ΔBMD (β=137.86), temperature (β=-89.01), D ACWR (β=55.11), MS (β=-3.71), RHR (β=-4.88), ΔBF% (β=-0.80), and ΔLM (β=0.15). No force plate variables were selected as significant. **CONCLUSION:** The positive coefficients of ΔBMD and ΔLM suggest gaining or maintaining bone and LM values across the season may promote AA, possibly related to higher D ACWR. The negative coefficients of temperature and RHR indicate higher AA is associated with greater sleep recovery. Comprehensive monitoring is important to identify driving components for AA to support injury prevention.

P252: EFFECTS OF A HEATED ENVIRONMENT ON MAINTAINING ATHLETIC PERFORMANCE AFTER EXTENDED REST

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In team sports, many players substitute into competition following an extended time of passive rest after the initial warm-up. Studies have shown a decline in athletic performance following increased time of passive rest, and still other researchers have found benefit to adding heated garments during rest on performance maintenance. However, use of a high ambient temperature to maintain muscle temperature has not been investigated. Thus, the purpose of this study was to compare the effects of passive rest in a heated versus normal environment on post-warm-up 10m sprint time and countermovement jump height (CMJ). Physically active (150+ min/week moderate activity) college-age males were recruited to participate in this study; participants visited the laboratory on two occasions. On each visit, participants completed a standardized warm-up lasting approximately 10 minutes and then completed 20 minutes of seated rest in either a room temperature (68-75 degree F) or heated (90-91 degree F) environment. The order of the two sessions was counterbalanced. During both sessions, participants completed two repetitions of a CMJ using force plates and two repetitions of a 10-meter sprint. Participants also completed a readiness to sprint scale before and after the rest session. After rest in the hot environment, CMJ was significantly lower compared to normal temperature (0.469±0.036 vs 0.473±0.026 meters, p=0.0108) and sprint time trended slower (1.903±0.082 vs 1.855±0.095 seconds, p=0.063). Readiness to sprint, evaluated using a visual analog scale ranging 1-10, was significantly higher in the hot vs normal environment (7.13±1.55 vs 6.33±1.37 units, p=0.0103). These data indicate that rest in a heated environment does not attenuate performance declines and in fact worsens it. However, psychological measures of performance readiness are improved after heat, suggesting that psychological measures of performance readiness do not always correspond to measured performance.

P253: EFFECTS OF JOCKO GO ON MEASURES OF STRENGTH AND POWER

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BACKGROUND: Energy drinks, such as JOCKO GO, contain supplements such as caffeine, vitamins, and electrolytes. Companies that produce these beverages advertise outcomes of improved physical performance, specifically power and strength, post-consumption. The purpose of this study was to compare measures of power and strength following ingestion of JOCKO GO versus a placebo in resistance-trained individuals. **METHODS:** Four resistance-trained individuals (age= 20±0 yrs; male= 1, female=3), volunteered to participate. Participants were given JOCKO GO or a placebo beverage on two separate visits, in a counterbalanced format. At 30 minutes post consumption, participants completed a warm-up, followed by a countermovement vertical jump (VJ) and isometric thigh pull (ITP) to assess power and strength, respectively. VJ assessment was conducted using an AMTI AccuPower platform. The jump height (HT), net impulse (NetImp), relative peak force (RelPF), and rate of force development (RFD) were recorded. ITP was performed using a stationary dynamometer (Preston Corporation). The Significant differences between measures of power and strength following JOCKO GO and placebo and were determined using Wilcoxon Signed Rank Tests. Significance was accepted a priori p≤0.05. **RESULTS:** There were no significant differences (p>0.05) between JOCKO GO and placebo for HT (placebo=0.3±0 m, JOCKO GO=0.3±0.1 m, p=0.07), NetImp (placebo=163.7±10 Ns, JOCKO GO=168.2±15.2 Ns, p=0.27), RelPF (placebo=23.8±2.2 N/kg, JOCKO GO=22.4±1.7 N/kg, p=0.27), RFD (placebo=4640.6±677.3 N/s, JOCKO GO=3930.2±652.7 N/s, p=0.14), or ITP (placebo=130.8±32.7 kg, JOCKO GO=136.8±33.2 kg, p=0.07). **CONCLUSIONS:** Preliminary results from this study suggest that JOCKO GO does not improve power and strength post-consumption. However, future studies should include a larger sample of participants. Notably, while not statistically significant, a trend suggests that ITP may be greater following consumption of JOCKO GO.

P254: DOES A FLYWHEEL MUSCLE ACTIVATION PROTOCOL ENHANCE SPRINT SWIM PERFORMANCE?

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BACKGROUND: Tenths of a second are critical to the sporting success and livelihood of sprint swimmers. Strength and power, factors related to swim speed, can be temporarily augmented through acute resistance exercise, but many aquatics venues lack access to traditional equipment. Flywheel exercise can solve this dilemma through its portability and provide a unique stimulus emphasizing eccentric contraction. Current literature suggests lower-body flywheel muscle activation may be beneficial to sprint swimmers but lacks applicability due to the rest interval and non-individualized inertial load prescription. METHODS: This study will use a counterbalanced crossover design to assess 30 athletes ages 15-35 years meeting time standards of < 23.5s (males) or < 25.5s (females) for a 50-yard freestyle race. Familiarization includes instructions on flywheel technique and assignment of inertial load. Body composition (3-Site Skinfold), lower body power (Vertical Jump), and lower body strength (1RM Trap Bar Deadlift) will also be assessed. Testing visits will occur on consecutive days and be comprised of a 50-yard freestyle trial preceded by either swimming only or flywheel muscle activation. 30 minutes of rest will be given between warm-up and trial. Swim times at 25 and 50 yards will be determined using touchpads. Recordings of each trial via a dual camera system will be used to determine time splits and velocities at 5 yard increments. Analyses will be conducted in Jamovi with an a priori alpha < 0.05. A linear mixed model will be used to evaluate differences in performance with post-hoc testing to determine significant intervals. Exploratory analyses will be conducted to further understand underlying factors that may predict a swimmer's response to flywheel muscle activation. ANTICIPATED RESULTS: We expect that flywheel muscle activation will enhance sprint swim performance during a 50-yard freestyle trial, particularly during the start and turn of the race.

P255: MUSCULAR STRENGTH MEASUREMENTS THROUGH HAND-HELD & ANCHORED DYNAMOMETRY: A STUDY OF TEST-RETEST & INTERRATER RELIABILITY

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Background: Handheld dynamometry (HHD) offers a cost-effective and accessible method for measuring maximal voluntary contraction (MVC) compared to larger fixed dynamometers. However, issues like strength differences between the rater and subject, incorrect dynamometer placement, or inadequate reactive force by the rater may introduce errors. This study aimed to determine if fixing the portable HHD device to a support anchor could improve intra- and inter-rater reliability across different muscle groups. **Methods**: Twelve healthy adults (7 males, 5 females; Age = 20.58 ± 2.35 years) performed MVCs for ten muscle groups on two separate days with two raters. A Lafayette Instruments Model 01165 (Handheld Dynamometer Model 01165A; Lafayette Instruments, Lafayette, IN, USA) was used independently for the HHD condition. Then a Model 01166 support stand was used to fix the HHD device for the anchored condition. Intraclass correlation coefficients (ICCs) were calculated to assess interrater and intrarater reliability for both conditions. **Results**: Interrater reliability was good for HHD (ICC = 0.891) and excellent for the anchored condition (ICC = 0.945). Intrarater reliability was excellent for both HHD (ICC = 0.933) and the anchored condition (ICC = 0.953). Significant interrater reliability improvements with the anchored condition were observed in elbow extension (0.890 to 0.931), neck extension (0.818 to 0.902), and plantar flexion (0.406 to 0.814). Conversely, knee flexion (0.846 to 0.670) and extension (0.724 to 0.670) showed higher interrater reliability with HHD. In terms of intrarater reliability, improvements were noted for plantar flexion (0.856 to 0.958) and neck extension (0.898 to 0.934) using the anchored condition, but HHD outperformed the anchored condition for knee extension (0.848 to 0.743) and flexion (0.743 to 0.472). **Conclusions**: Fixing the HHD to a support stand improved reliability overall, with moderate to excellent ICC values across various muscle groups. However, variations were observed, particularly in knee flexion and extension, possibly due to testing protocols on the treatment table.

P256: THE EFFECT OF ELEVATION TRAINING MASKS ON MUSCLE STRENGTH & ENDURANCE

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BACKGROUND: It's been proposed by many that elevation training masks may simulate some of the benefits of training at altitude, yet research on their efficacy remains inconclusive. The purpose of this study is to investigate whether elevation training masks can improve either muscular endurance or cardiorespiratory performance. **METHODS:** Twelve college-aged males and females will be recruited to participate in this study. Participants will complete a pre-assessment physical strength test consisting of maximum pushups, plank hold, vertical jump, and a VO2 max test. Participants will then be divided into two groups for training. One group (ETM) will train wearing an elevation training mask while the other (NOR) will train normally without any restrictions. Both groups will undergo the same workouts; intensity will be tracked using RPE to ensure training level consistency across subjects. Baseline testing will be repeated at the end of the 6-week training program. **ANTICIPATED RESULTS:** It is hypothesized that elevation training masks will have a positive influence on respiratory muscles, resulting in an increased ability to bring oxygen into the body. This in turn will demonstrate increases in muscle strength, endurance, and function in the ETM group compared with NOR.

P257: THE EFFECTS OF ACUTE CAPSAICIN SUPPLEMENTATION ON UPPER BODY MUSCULAR ENDURANCE DURING EXERCISE

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BACKGROUND: Resistance training is a crucial part in developing an athlete and optimizing sports performance. Supplementation is commonly utilized to help counteract some of the adverse effects of weight training and improve recovery. Capsaicin is a natural supplement that has been used to improve force output. Previous research has hypothesized that it binds to the transient receptor potential vanilloid-1 receptor and stimulates the sympathetic nervous system and calcium release in the skeletal muscle. This results in increased energy expenditure through lipolysis and fatty acid oxidation and, most notably for resistance training, increased force production and endurance. The purpose of this study will be to assess the effects of acute capsaicin on upper body muscle endurance. **METHODS:** 20 college aged, healthy, resistance trained participants will be recruited for this randomized, crossover design study. During each visit, participants will complete 4 sets of bench press at 70% of 1 repetition max with 120 seconds of rest between sets. For each of the two visits, participants will either ingest the capsaicin supplement or a placebo 45 minutes before exercise. The capsaicin supplement will be a 30mg capsule. There will be an at least 4 day washout period between visits. During each visit, heart rate will be measured at rest, during exercise, and post exercise. Blood lactate will be measured at rest and post exercise. Participants will be assessed for rate of perceived exertion and given a visual pain analog scale pre-supplement, pre-exercise, and post exercise. The number of repetitions performed by participants will be tracked during both conditions. **ANTICIPATED RESULTS:** It is expected that the participants will experience an increase in total repetitions under the capsaicin condition. Blood lactate and heart rate is not expected to change significantly under the capsaicin condition compared to the placebo condition. Rate of perceived exertion is expected to be lower in the capsaicin condition. Pain assessed by the pain analog scale is expected to be lower under the capsaicin condition.

P258: HOW DO BURNOUT AND PHYSICAL ACTIVITY AFFECT COGNITION IN ATHLETIC TRAINERS

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Background: The job of emergency first responders is to react quickly to high stress situations and execute objectives effectively. Evidence suggests that emergency first responders who experience a decreased quality and amount of sleep will have lower cognitive function, physical and mental health; this could be a factor of burnout. Burnout is defined as a psychological syndrome that is characterized by decreased perception of personal accomplishment, depersonalization of others, and emotional exhaustion that affects the well-being of working professionals. The consequence of high levels of burnout is a reduced occupational execution and activity level, which is attributed to a decreased level of cognitive function. This is an occupational deficit that could be partially mediated through regular physical activity by lowering stress, thus lowering the effects of burnout. It is difficult in a high intensity environment to maintain a consistent level of physical activity due to the decreased cognitive function and lack of desire. The purpose of this proposed study is to assess the effect of burnout and physical activity on cognitive function, specifically reaction time, of athletic trainers. **Methods**: We plan to recruit 10 athletic trainers from collegiate and high school settings. Specifically for this study, we will assess the correlation between burnout, physical activity, and cognitive function. To measure burnout, we will use the Maslach Burnout Inventory. To measure physical activity we will be using the short form of the International Physical Activity Questionnaire. For cognitive function measurements, we will be using the Montreal Cognitive Assessment and a discriminatory reaction time test. **Anticipated Results**: We hypothesize that athletic trainers with high levels of burnout and low levels of physical activity will have lower cognitive function.

P259: ATHLETE MONITORING: RELIABILITY OF WEEKLY JUMP TESTING WITHIN A COLLEGIATE WOMEN'S VOLLEYBALL SEASON

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BACKGROUND: Jump testing provides a non-exhaustive and noninvasive measure of lower body neuromuscular performance that can be practically measured within the constraints of in-season training. The purpose of this study was to assess the within-week difference of countermovement jump (CMJ) height between Mondays (M) and Wednesdays (W); and to compare the week-to-week reliability of Monday and Wednesday CMJ height during the competitive season. METHODS: Eleven female NCAA Division-I volleyball athletes (age = 19.8 ± 0.8 years, range 18-21 years, height = 1.75 ± 0.07 m, body mass = 71.6 ± 8.9 kg) volunteered to participate in the study. Jump testing was performed on dual force plates sampling at 1000 Hz (PASCO, Roseville, CA, USA). Week-to-week reliability was assessed using Pearson correlation coefficients (r), and intraclass correlation coefficients (ICCs). Six paired samples t-Tests were computed to assess the difference in jump height from Monday to Wednesday testing and effect sizes were calculated according to Choen's criteria (d). A Bonferroni correction was applied resulting in a critical value of 0.0083. RESULTS: Non-significant differences were observed between Monday and Wednesday testing sessions; M1-W1 (p= 0.393; d= -0.269), M2-W2 (p= 0.153; d= 0.618), M3-W3 (p= 0.011; d= -0.933), M4-W4 (p= 0.163; d= 0.454), M5-W5 (p= 0.276; d= -0.367), M6-W6 (p= 0.328; d= 0.310). Strong week-to-week reliability and ICC's were observed for Monday-Monday (r= 0.93; ICC= 0.91) and Wednesday-Wednesday (r= 0.95; ICC= 0.95) testing. CONCLUSION: There were no statistical differences between Monday and Wednesday testing for CMJ height, although the impact that acute or chronic workloads had on jump performance was not investigated here. Future investigations may consider mechanisms to explain observed changes in jump performance during a competitive season.

P260: EFFECT OF GAS SAMPLING INTERVAL ON VO2MAX AND VO2 PLATEAU IDENTIFICATION

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BACKGROUND: Measurement of maximal oxygen uptake (VO_2 max) during an aerobic exercise test is an important component of assessing aerobic fitness. Using a metabolic cart, VO_2 max can be sampled at different intervals during testing. Sampling at different intervals produces different VO_2 max results which can affect the plateau of the test that is used to determine if a true maximal test was completed. METHODS: 20 student athletes (20.3 ± 1.6 yr) completed a progressive speed treadmill protocol. VO_2 data was collected and analyzed using a metabolic cart. The protocol started at 9 kilometers per hour (km/h) and increased by 1 km/h every minute until max treadmill speed was reached. If the participant reached max speed, the incline increased by 1.5% every minute. Results were analyzed at three different time-averaged sampling rates: 15 seconds, 30 seconds, and 60 seconds. VO_2 max was defined as the highest recorded value for each sampling interval. A VO_2 plateau was identified as a change in $VO_2 \leq 2.1$ mL/kg/min for sequential work intervals. A repeated measures ANOVA compared VO_2 max values among gas sampling

intervals. A chi square test of independence tested the relationship among sampling intervals and attainment of a VO_2 plateau. Alpha was set at .05. RESULTS: There was a statistically significant difference among all gas sampling intervals, $F(1.2, 23.6) = 55.70$, $p < .001$, $\eta^2 = 0.75$. VO_2 max in the 15s interval (54.4 ± 3.8) was greater than the 30s interval (53.3 ± 4.0), which was greater than the 60s interval (52.6 ± 4.0). There was no relationship among gas sampling interval and plateau incidence, $x^2 (2) = 2.55$, $p = .28$. Plateau attainment occurred in 75 percent, 90 percent, and 70 percent of subjects at the 15s, 30s, and 60s intervals. CONCLUSIONS: Gas sampling interval was not related to the identification of a VO_2 plateau, contrary to prior findings. Gas sampling interval did impact reported VO_2 max values. Shorter time-averaged intervals resulted in greater VO_2 max values. These findings emphasize the importance of consistency and transparency in use of gas sampling intervals when reporting VO_2 max.

P261: TRACKING SUBJECTIVE WELLNESS ACROSS A COLLEGIATE SOCER SEASON: ANALYSIS OF WELLNESS AND FATIGUE THROUGH Z-SCORES

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Background: Monitoring athlete wellness is important for performance and reducing injury risk. This study aimed to assess changes in subjective wellness among Division I collegiate soccer athletes throughout a competitive season, using Z-scores to normalize individual wellness data. Parameters such as sleep quality, training readiness, mental load, and soreness were tracked to examine wellness fluctuations in relation to match days and explore the implications for personalized training and recovery strategies. Methods: Thirty-one Division I soccer athletes (mean age: 20.79 ± 1.51 years; mean height: 167.64 ± 6.26 cm) completed daily wellness questionnaires during the season, providing data on sleep duration, sleep quality, soreness, training readiness (RPE), mental load, and stress management. Z-scores were calculated for each variable, and the Total Score of Wellness (TSW) was derived by averaging the Z-scores. TSW was analyzed across four days leading up to match day (MD-4, MD-3, MD-2, MD-1) and match day (MD) using a Friedman test to assess differences ($\alpha \leq 0.05$). Results: Significant variations in wellness scores were observed across days. MD-4 scores were significantly lower than MD-3, MD-2, and MD-1 ($p < 0.001$), while MD-3 scores were higher than MD ($p < 0.001$). MD-2 and MD-1 scores were both lower than MD ($p = 0.001$). These fluctuations suggest increased stress and mental load as match day approaches, likely reflecting changes in athlete readiness and arousal states. Conclusion: The data suggest that wellness declines as match day nears, with stress and mental load increasing, which may influence performance. By consistently monitoring wellness, coaches can adjust training and recovery programs to better align with athlete readiness, minimizing injury risks and optimizing performance. Future research should integrate physiological markers, such as heart rate variability, alongside wellness data to provide a more comprehensive understanding of athlete health.

P301: DIETARY BERBERINE SUPPLEMENTATION REDUCES HEART RATE RESPONSE DURING EXERTIONAL HEAT STRESS

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Purpose: Berberine has been a core staple of Chinese medicine for centuries, where it has been shown to have a wide variety of pharmacological benefits. Recent research has shown improved core temperature regulation in mice during passive heat stress, however, this relationship has not been translated to a human model. This study examined the potential utility of dietary berberine supplementation on whole body and cellular responses to exertional heat stress. **Methods:** Five men and two women (mean ± SD: Age 22.7 ± 3.4 years, height 173.3 ± 2 cm, mass 71.6 ± 3.1 kg, VO_{2max} 51.4 ± 2.8 $mL \cdot kg^{-1} \cdot min^{-1}$, body composition 12.2 ± 2.3% body fat) ingested 1.5 g of Berberine or Placebo for 7d prior to a 1hr treadmill run (60% VO_{2max}) in hot, dry ambient conditions (35°C & 35%RH). Blood samples were collected before (Pre), immediately following (Post), 1 hour (1-Post), and 3 hours after (3-Post) exercise. Core temperature, shell temperature, heart rate (HR), thermal sensation, perceived discomfort, perceived exertion, and expired gasses (V_E/VO_2) were measured throughout exercise. **Results:** HR was significantly lower ($p<0.01$) when participants were supplemented with Berberine (158 ± 22 bpm) as compared to Placebo (161 ± 23 bpm). V_E/VO_2 exhibited a trend towards significance ($p=0.14$), where values with Berberine (26.0 ± 1.1 L/min) trended lower as compared to Placebo (27.5 ± 3.0 L/min). **Conclusion:** These data indicate that dietary berberine supplementation may improve HR and ventilatory responses to exertional heat stress, which could enhance an individual's ability to maintain prolonged aerobic exercise under hot, dry ambient conditions.

P262: ORTHOSTATIC BLOOD PRESSURE CHANGES ARE NOT DIFFERENT IN METABOLIC SYNDROME DESPITE IMPAIRED CARDIOVAGAL BAROREFLEX SENSITIVITY

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BACKGROUND: Autonomic function is known to be impaired in individuals with metabolic syndrome (MetS), demonstrated, in part, by reduced cardiovagal baroreflex sensitivity (cBRS). This study tested the hypothesis that the increase in blood pressure from seated to standing would also be exaggerated in individuals with MetS, providing a quick assessment tool for autonomic dysfunction. **METHODS:** Brachial blood pressure (BP) and heart rate (HR) was recorded in the standing and seated positions in 18 individuals meeting the NCEP ATP III criteria for MetS and 18 control participants matched for age, sex, and race. BP and HR were collected twice in each position (separated by 1 minute), and seated testing always occurred first. For cBRS assessments, beat-by-beat BP and HR were continuously recorded while the participant breathed at a rate of 7 breaths/minute and the systolic blood pressure (SBP) and cardiac interval values were then used to calculate the cBRS gain of all up-ramping (cBRSup), all down-ramping (cBRSdown), and all combined baroreflex sequences (cBRSall). Baroreflex sequences were identified using an r value > 0.8, an interbeat delay of 1 beat, a minimum sequence length of 3, and minimum increases in SBP and cardiac interval of 1 mmHg and 5 ms, respectively. Independent samples t-tests were used to compare cBRS values between groups, and repeated measures analyses of variance (RMANOVA) were used to compare the changes in BP and HR across positions and between groups. **RESULTS:** Individuals in the MetS group demonstrated significantly attenuated cBRSall (14.6±8.2 ms/mmHg vs. 23.5±13.4 ms/mmHg), cBRSup (17.3±10.6 ms/mmHg vs. 29.9±18.1 ms/mmHg), and cBRSdown (12.1±6.6 ms/mmHg vs. 18.4±6.8 ms/mmHg; all $p<0.016$). Likewise, SBP, diastolic pressure, mean arterial pressure, and HR all significantly increased from the seated to standing positions ($f >16.1$, $p<0.001$), but no significant group by time interactions were observed ($f<0.218$, $p>0.644$). **CONCLUSIONS:** Based on these findings, a 5-minute seated to standing blood pressure assessment is not a sensitive measure of generalized autonomic dysfunction individual with MetS, despite attenuated cBRS. Funding: This project was supported by the National Institute of General Medical Sciences grant number U54GM115428 and The University of Southern Mississippi.

P302: ASSESSING FIREFIGHTER PERCEPTIONS OF EXERCISE AS AN EFFECTIVE DISEASE AND ILLNESS RISK REDUCTION STRATEGY

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BACKGROUND: Firefighters are critical public safety personnel; however, the nature of their occupation and lifestyle put them at an increased risk of many chronic diseases and illnesses. Higher exercise and fitness levels have been shown to reduce one's risk of many diseases and illnesses. Given that disease risk perceptions are key determinants for health behavior change, the purpose of this study was to explore firefighter perception of exercise as a disease and illness risk reduction strategy. METHODS: 252 firefighters (15 women; age=36.0±8.5yrs; height=1.8±0.1m; weight=94.8±17.4kg; BMI=29.7±4.8kg/m^2) from eight departments across the Southeastern region answered an open-ended question, "*To the best of your knowledge, what specific illnesses or diseases, if any, are individuals at*

a higher risk of developing due to a lack of exercise? If none, please state N/A." Diseases and illnesses identified were categorized into 10 disease and illness groupings. RESULTS: 87% of firefighters identified at least 1 disease or illness that individuals were at higher risk of developing due to lack of exercise. Firefighters specifically noted cardiovascular (75.4%) and metabolic (52.4%) disease most frequently, followed by musculoskeletal (9.5%), cancer (8.3%), respiratory (6.7%), mental (3.6%), neurodegenerative (2.8%), and immune (1.2%) disease or illness. Other and none resulted in 1.2% and 13.1% of total firefighter responses, respectively. CONCLUSIONS: The majority of firefighters indicated that a lack of exercise increases one's risk of diseases and illnesses, specifically cardiovascular and metabolic diseases. However, a small percentage (≤9.5%) of firefighters indicated that a lack of exercise increases one's risk of other diseases and illnesses, while 13% indicated no disease or illness risk reduction impacts from exercise. These findings highlight that the majority (87%) of firefighters were aware of the important risk-reduction benefit of exercise for at least one disease or illness. However, a small percentage of firefighters linked lack of exercise to current high-priority health concerns (e.g., cancer) within the fire service.

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P303: EFFECT OF SHIFT SCHEDULE ON FIREFIGHTERS' SLEEP OUTCOMES

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BACKGROUND: Adequate sleep is critical for optimal health and physical performance. Fire agencies utilize a variety of shift schedule configurations that may have different effects on firefighters' sleep outcomes. It is important to investigate the impact of shift schedules on firefighters' sleep to identify appropriate on- and off-duty interventions and inform work schedule configuration. Therefore, the purpose of this study was to descriptively compare sleep outcomes between fire agencies utilizing different shift schedules. METHODS: Firefighters employed by (2) departments utilizing a 24 hr on-duty, 48 hr off-duty (24/48; n=110, Age:37.0±8.3 yr; Experience: 12.9±8.3 yr) and 4 Platoon system (4P: 1d on/1d off/1 d on, 5d off); n=45, Age:37.5±8.9 yr; Experience: 11.9±8.9 yr) completed the Pittsburgh Sleep Quality Index (PSQI) and Emergency Service Sleep Diary (ESSD) to assess sleep quality and quantity outcomes via an electronic survey. Firefighters reporting a sleep disorder were excluded from the analysis. Independent samples t-tests and nonparametric Z tests compared PSQI (0=best; 21=worst), ESSD, and proportional outcomes between shift cohorts. RESULTS: Firefighters using the 24/48 reported lower overall (i.e., on- and off-duty) PSQI sleep quality scores than 4P (9.1±3.4 vs. 7.3±3.4, p=0.008). Regarding on-duty sleep, 90% of 24/48 and 86% of 4P firefighters did not achieve the recommended amount of sleep. Off-duty, 50% of 24/48 and 26% of 4P firefighters did not meet sleep recommendations. On-duty sleep duration (24/48: 4.6±1.6 vs. 4P: 4.9±1.7 hr, p=0.366) and nighttime emergency call load (frequency x duration; 24/48: 110.0±102.6 vs. 4P: 142.9±84.1 AU, p=0.074) were similar between shifts. Off-duty sleep duration was also similar between shifts (24/48: 7.0±2.2 vs. 4P: 7.4±1.4 hr, p=0.303). Incidence of napping on-duty (24/48: 25.7% vs. 4P: 25.6%, p=0.992) and off-duty (24/48: 31.8% vs. 4P: 30.2%, p=0.854) was similar between shifts. CONCLUSIONS: These findings indicate that overall sleep quality was worse among firefighters working a 24/48 shift, however many firefighters from 24/48 and 4P shifts were not obtaining recommended amounts of sleep to support desirable health outcomes.

P304: RELATIONSHIP BETWEEN PLASMA OSMOLALITY AND URINE SPECIFIC GRAVITY IN RECREATIONAL RUNNERS

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Background: Urine specific gravity (USG) is a method frequently used in field settings but may demonstrate latency when compared to measurements derived from plasma. Thus, the purpose of this investigation was to assess the relationship between measurements of urine specific gravity and plasma osmolality before and after a 60 min run. Methods: 19 recreationally trained runners (female, n = 6; age, 27 ± 7 y) participated in a single 60 min outdoor run during the months of August or September. The 60 min run was conducted on a 1.6 km concrete loop. Pre- and Post-run measures of body mass (BM), urine specific gravity (USG), and plasma osmolality (P_{osm}) were collected. Participants were provided a sports drink and ad libitum fluid ingestion was recorded. Pearson correlations were used to assess associations between pre-run USG and P_{osm} and between post-run USG and P_{osm}. Paired samples t-tests were used to assess the difference in pre-run and post-run values for USG, P_{osm}, and BM. A significance level of α = 0.05 was used for all statistical tests. Results: Pre-run measures of USG, BM, and P_{osm} were 1.015 ± 0.008, 74.84 ± 12.21 kg, and 288 ± 4 mosm/kg, respectively. Post-run measures of USG, BM, and P_{osm} were 1.011 ± 0.007, 73.86 ± 12.41 kg, 295 ± 4 mosm/kg, respectively. Pre-run USG (r = 0.226, p = 0.352) and Post-run USG (r = 0.020, p = 0.935) were not significantly associated with Pre-run or Post-run P_{osm}, respectively. Post-run BM (Δ = -0.98 ± 0.83 kg, p < 0.001) and USG (Δ = -0.003 ± 0.006, p = 0.038) were significantly lower than pre-run. Whereas Post-run measures of P_{osm} (Δ = 7 ± 3 mosm/kg, p < 0.001) were significantly greater than Pre-run measures. Conclusion: A significant overall decrease in mean BM supports that the participants dehydrated during the run. USG and Posm were not significantly associated before or after a 60 min run. Both USG and Posm demonstrated differences between pre-run and post-run, however, the changes were dichotomous such that the USG changes suggest a greater level of hydration after the run, while the Posm changes suggest a greater level of dehydration after the run. Thus, our findings support that Posm and BM measurements may be more accurate in determining changes in hydration than USG following exercise. *This material is based upon work supported by the National Science Foundation under Cooperative Agreement No. 2234491.

P305: EFFECTS OF PRE-COOLING ON 5K TIME TRIAL PERFORMANCE IN MALES AND FEMALES

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Endurance exercise capacity diminishes under hot environmental conditions, but it has been shown that pre-cooling can be used to decrease the risk of heat related illnesses and enhance performance in male athletes but not female athletes. Due to the typical difference in body size of males and females, it is plausible that they would respond differently to pre-cooling via cold water immersion (CWI). Thus, the purpose of this study was to determine the impact of pre-cooling via CWI on subsequent aerobic performance in the heat and to determine if there was a difference in male versus female participants. Aerobically trained males (n=4) and females (n=4) participated in this study. In a randomized, counterbalanced study design, participants completed two trials. For one trial, participants sat on a massage table for 30 minutes (CON) and for the CWI trial, participants sat in a tub of water at mid-sternum level between 22-23 °C for 30 minutes. Following the intervention, participants completed a 10-minute standardized warm-up followed by a 5-km time trial on a non-motorized treadmill in which participants were blinded to their time. Internal temperature (TINT) was assessed with an ingestible thermistor (BodyCap) and heart rate (HR) was assessed (Polar Monitor) throughout the trial. Participants were also asked to record their rating of thermal sensation (TS) (0.0 unbearably cold through 8.0 unbearably hot) throughout the trial. There was no significant interaction for TINT, HR, or TT (p > 0.05). When male and female data were combined, TT performance improved following CWI compared to a control (MD ± SE, 1.38 ± 0.28 min, ES = 0.52). Thermal sensation was lower in CWI compared to CON (p<.001). Descriptively, it is notable that females ran on average 2.4 minutes faster and males ran 4.3 minutes faster following CWI compared to CON. Future research is needed to determine if males respond differently to CWI than females since the current sample size is not adequate to fully elucidate this research question.

P306: CONTENT VALIDITY OF VISUAL ANALOG SCALES FOR EXERTION AND COMFORT DURING EXERCISE IN THE HEAT

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BACKGROUND: Subjective, Likert-type scales are ubiquitous in exercise physiology research. However, many argue ordinal data create measurement and evaluation issues with parametric analysis and recall bias. Visual analog scales (VAS) provide an alternative tool to assess subjective measures related to exercise. This study aimed to evaluate the validity of a visual analog scale for session ratings of perceived exertion (SRPE - VSRPE) and ratings of thermal comfort (RTC - VRTC) to discriminate between two exercise intensities in the heat. **METHODS:** Ten (n = 10; female = 4) participants (aged 24 ± 3 y) completed 20 minutes of walking at 3 METs or 6 METs (69.68 $m \cdot min^{-1}$ at 0% or 8.5% grade) followed by 10 minutes of seated recovery in counter-balanced, cross-over design within an environmental chamber (35.9 ± 1.9 ^{o}C; 34.9 ± 3.1% RH). VAS scales were created using 100 mm lines anchored with two extremes "No Exertion" and "Maximal Exertion" (for VSRPE) and "Very Comfortable" and "Very Uncomfortable" (for VRTC). Participants were instructed to draw a vertical line intersecting at a point that best represented where they fell on the spectrum for exertion and comfort during the protocol. A paired-samples, one-tailed *t*-Test was used to investigate mean differences between session measures of the 3-MET and 6-MET protocols for VRPE and VRTC. Continuous variables are reported as means ± SD. **RESULTS:** VSRPE was different after the protocol (exercise + recovery) between 3 METs (27 ± 27 mm) and 6 METs (45 ± 17 mm; p = 0.03, d = 0.75). Similarly, VRTC differed between 3 METs (22 ± 17 mm) and 6 METs (37 ± 25 mm; p = 0.002, d = 0.70). C**ONCLUSIONS:** Both VAS scales were able to demonstrate a sensitivity to detect increased session RPE or session RTC at differing exercise intensities in the heat. Taken together, these data support the use of VRPE and VRTC in applications where researchers or practitioners would like to have continuous data that limits bias in serial measures.

P307: THE EFFECTS OF CAFFEINE INGESTION AND INDOOR CYCLING ON COGNITIVE PERFORMANCE

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BACKGROUND: Acute moderate- and vigorous-intensity aerobic exercise, including indoor cycling, has been shown to improve reaction time on the Stroop Test with varied results in regard to accuracy. Caffeine consumption results in no change or detrimental effects on Stroop Test performance. This study aimed to determine the joint effects of indoor cycling and caffeine consumption on cognitive performance, as measured using congruent (task A) and incongruent (task B) Stroop tasks. METHODS: Ten active participants (Age 21.4 ± 1.9 years; BMI 23.2 ± 2.1 kg/m²; Body Fat % 21.5 ± 0.1; Weekly Exercise 400 ± 216 min; VO2 Peak 37.4 + 8.3 mL/kg/min) engaged in 3 exercise sessions: 2 consisted of a 30-minute pre-recorded indoor cycling class where caffeine (CAFF) or placebo (PLA) was administered in a single-blind design. The third session served as a control (CON) and intensity was matched to that achieved in CAFF. CAFF was administered at 4 mg/kg 45 minutes prior to initiation of exercise. Participants completed Stroop tasks A and B immediately before and 15 minutes following exercise. Reaction time and accuracy were evaluated using separate factorial ANOVAs with Bonferroni post-hoc testing when applicable. RESULTS: There was no interaction effect for task A response times, and no significant main effects for time or condition (p>0.05). There was no significant interaction effect for task B response times or main effect for condition (p>0.05); however, there was a main effect for time (p=0.03), with significant improvements in reaction time following exercise. There were no significant interaction or main effects for accuracy on tasks A or B of the Stroop Test (p>0.05). CONCLUSIONS: A 30-minute indoor cycling session can enhance response times for incongruent Stroop Test scores, with caffeine providing no detrimental effect. Accuracy scores were not affected by either indoor cycling or caffeine consumption.

P308: SELF-EFFICACY, PAIN, AND SOCIAL DETERMINANTS IN PHYSICAL FUNCTION WITH OSTEOARTHRITIS OF THE KNEE

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Background: The occurrence of knee osteoarthritis (OA) poses a significant problem for individuals' physical function. Strength training of varying intensities impacts physical function through improvements at the muscular level where activities of daily living may feel easier to accomplish. Strength training may also positively impact perceptions of ability and physical symptoms. Therefore, this study aims to explore whether self-efficacy and knee pain mediate the positive effects of strength training on physical function and how social determinants of health may influence the strength of this relationship. Methods: The Strength Training for Arthritis Trial (START) included 377 community-dwelling adults (≥ 50 years) with a body mass index ranging from 20 to 45, knee pain, and radiographic knee OA, who self-reported disability due to knee OA. Measures of self-efficacy, the Short Physical Performance Battery, 6-minute Walk Distance, Western Ontario and McMaster Universities OA Index pain and function, and the SF-36 Physical were collected before randomization and again at an 18-month follow-up in adults with knee OA who were assigned to 1 of 3 treatment conditions: high-intensity strength training, low-intensity strength training, or attention control. Additionally, sex, race, ethnicity, as well as annual household income, and education levels were collected at the baseline visit. Anticipated Results and Implications: It is hypothesized that confidence and changes in knee pain are important outcomes in strength training programs for individuals with knee OA that will, in turn, increase physical function and that both demographic and social determinants will impact the strength of this relationship. Strength training programs designed to influence aspects of physical function should consider methods to improve self-efficacy and assist individuals with managing physical symptoms while tailoring interventions to specific subgroups in the population of individuals with knee OA. This study was supported by grants 1R01AR059105-01 from the National Institute of Arthritis and Musculoskeletal and Skin Diseases and P30 AG21332 from the National Institute on Aging.

P309: VARIATIONS IN BODY COMPOSITION DERIVED ENERGY BALANCE ACROSS THROUGHOUT SIX WEEKS OF OVERFEEDING

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Background: Energy balance (EB) knowledge is crucial for weight management and optimizing athletic performance. A positive, or neutral EB, is vital for proper recovery and increasing body mass (BM) and fat free mass (FFM). While, a prolonged negative EB is necessary for weight loss, however, if unmanaged can lead to numerous deleterious effects. Changes in dual-energy X-ray absorptiometry (DXA) fat mass (FM) and FFM have previously been used to estimate average daily EB. However, little is known about this relation to other body composition devices. Thus, the purpose of this investigation was to assess the variance between the established DXA derived EB method and EB estimated from other body composition devices. **Methods:** 21 males (Age: 21.9±2.6yrs; Weight:74±10.9kg; BF%:15±9.5) completed a 6-week overfeeding and supervised resistance training protocol in which they were required to gain ≥0.45kg of BM per week. Body composition was assessed at pre and post by DXA, BIA, BIS, digital anthropometry (Fit3D, SS), ADP, and 4-compartment model (4C). Averaged daily EB across the 6 weeks was estimated via changes in FM and FFM from each body composition method used in the following equation: EB = (ΔFFM/Δt) + (9.5*ΔFM/Δt) where Δt represents the days between assessments. A one-way repeated measures ANOVA was performed to assess differences in EB across methods. Significance was accepted at p≤0.05. **Results:** A main effect of method was seen (p<0.001). Post hoc pairwise comparisons with a Bonferroni correction revealed significant differences between Fit3D (1041+/-873 kcals/day; p=0.006) and BIS (75+/-358 kcals/day; p=0.004) when compared to DXA criterion (397+/-324 kcals/day) **Conclusions:** Fit3D had overestimation by 644.8 kcals/day on average when compared to DXA while BIS underestimated by 321.7 kcals/day. These data suggest BIA, BIS, ADP, SS, and 4C may provide comparable EB estimations to DXA. However, Fit3D and BIS should not be used in place of DXA derived EB.

P310: THE RELATIONSHIP BETWEEN SALIVARY AND SERUM ESTROGEN AND PROGESTERONE

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BACKGROUND: Intra- and inter-individual changes in menstrual cycle function cause significant fluctuations in estrogen (E2) and progesterone (P). These fluctuations alter the timing of the hallmark phases/events of the menstrual cycle (MC). Methods used to determine hormone levels and delineate MC phases in females traditionally require serial blood draws; however, this is invasive and burdensome. Saliva provides a noninvasive alternative for quantifying E2 and P in female-focused performance and health outcome research, but limited data is available on how serum and salivary hormone levels track across time. Therefore, the purpose of this study was to examine the relationship between serum and salivary E2 and P across 2 menstrual cycles. **METHODS:** Healthy females (n=21, age=21±3yrs, ht=163±4.5cm, mass=63.2±11.4kg) not taking hormonal contraceptives collected saliva and blood samples across 2 contiguous menstrual cycles (MC1 and MC2; day 1 of each cycle was the onset of menses). Blood samples were collected at four different time points during MC1: days 2-5 (early follicular), days 8-16 (late follicular) and twice during the 5-8 days after a positive urinary ovulation test (mid-luteal). In MC2, a single blood sample was collected during the 5-8 days after a positive urinary ovulation test. Saliva was assayed for E2 and P. Ovulation was confirmed with ovulation test strips and a serum P concentration >3.0 ng/mL. Repeated measures correlations were used to assess the relationship between serum and salivary E2, P, and the P:E2. **RESULTS:** Serum and salivary P (r=0.582, p<0.001, CI=0.379-0.732) and P:E2 (r=0.526, p=<0.001, CI=0.312-0.689) revealed a significant positive correlation, however E2 (r=0.230, p=0.080, CI =-0.028-0.459) was not correlated. **CONCLUSION:** Our data suggest salivary measures provide valuable information on P and P:E2 fluctuations across menstrual cycles, but salivary E2 measures are less reflective of serum E2. Depending on the study goals, saliva may provide a non-invasive alternative to serial blood sampling for hormonal assessments in females, alleviating participant burden and increasing the accessibility of these measures to researchers. Given our findings for E2, future research should confirm our findings in a larger cohort.

P311: EFFECTS OF CHLOROPHYLL SUPPLEMENTATION ON VO2MAX IN RATS

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BACKGROUND: Chlorophyll is gaining popularity as a supplement for enhancing various aspects of aerobic fitness. Previous research suggests that chlorophyll supplementation can increase red blood cell (RBC) count and hemoglobin (Hb) levels, which may contribute to improved exercise capacity. The purpose of this study is to investigate the effects of chlorophyll on VO2max, a key indicator of aerobic exercise capacity. **METHODS**: 24 male Sprague Dawley (2~3-month-old, Charles River Lab, Wilmington, MA) rats will be purchased and used in this study. These rats will be divided into three groups: the control group with saline solution (CON, n=8), the group with 30 mg/ml chlorophyll administration (C30, n=8), and the group with 60 mg/ml chlorophyll administration (C60, n=8). The chlorophyll (Liquid chlorophyll ES, Nature's Sunshine Products, Inc. Lehi, UT) will be administered daily for 14 days through tail-vein injection. The number of rats per group was determined by power analysis at a power of 80% at a significance probability level of p<0.05 using the hematocrit (Hct) and Hb levels reported in the previous study. The rats will be fed diets ad-lib containing purified ingredients to control macronutrient content and housed at room temperature in a light-dark cycle of 12 h. The blood drawing and VO2max test will be conducted before and after chlorophyll administration. The soleus and gastrocnemius muscles will be removed, snap-frozen in liquid nitrogen, and stored in a -80C freezer for further biochemical analysis. The blood samples will be analyzed for Hb concentration and Hct, while the muscle tissues will be used for Western Blotting and colorimetric assays to assess the levels of cytochrome oxidase c subunit IV (COX4) expression and activity, the last enzyme in the mitochondrial electron transport chain which drives oxidative phosphorylation and ATP production. A one-way ANOVA followed by a post hoc test will determine the groups' differences, with statistical significance set at p<0.05. **ANTICIPATED RESULTS:** Hct and Hb levels in the C30 and C60 groups are expected to be higher than those in the CON group. While COX4 expression may be similar across all groups, we anticipate increased COX4 activity will enhance VO2max in the C30 and C60 groups compared to CON.

P312: INFLUENCE OF WITHANIA SOMNIFERA ON PHYSICAL RECOVERY, SLEEP, AND DEPRESSION SYMPTOMS IN MALE COLLEGE STUDENTS

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BACKGROUND: Withania Somnifera (WS) is an evergreen shrub that has been widely used in ayurvedic medicine systems as an adaptogen which increases the body's ability to resist and adapt to biological, physical, and/or chemical stressors. Previous research has shown that there has been a significant decrease in cortisol levels over time after ingesting WS daily over an 8-week span. WS would be an alternative approach that costs less than prescription medication without the difficulties of going through the healthcare system. With evidence supporting the efficacy of WS, spreading awareness of this medication is the main goal of this study to give college students another option to consider. The purpose of this study is to contribute to the evidence that WS decreases cortisol levels as well as determine the effects of WS in male college students on cortisol levels post exercise and on depression, anxiety, and sleep. METHODS: The recruitment process for the participants will consist of handing out flyers with information about the study to male undergraduate students on campus. This will be an 8-week intervention study, each participant will either take WS orally twice daily for a total of 600 mg or the placebo (sugar pill) twice daily orally. At the beginning of the study, each participant will complete a muscle fatigue protocol (MFP) which is the leg press machine for a total of 5 sets for 10 repetitions each. A salivary sample will be taken after the MFP and the following 3 days as delayed onset muscle soreness (DOMS) is the most prominent 48-72 hours post exercise. The participants will then complete multiple surveys such as the Depression, Anxiety, and Stress Scale Questionnaire (DASS-21) and the Sleep Quality Scale (SQS). The salivary samples will be analyzed to determine the cortisol levels of each participant. Once the participants have completed the 8-week trial, they will complete the muscle damaging protocol and cortisol collection previously mentioned and the data prior to the study and after the study will be compared. ANTICIPATED RESULTS: It is hypothesized that individuals taking WS will show a significant decrease in cortisol levels post exercise and daily as well as decreased DASS-21 and SQS scores which would indicate an improvement in depression, anxiety, and stress and less sleep disturbances and more restful sleep.

P313: THE EFFECT OF WHEY PROTEIN AND A HIGH SODIUM BEVERAGE ON HYDRATION

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Dehydration can lead to decreased performance, heart rate, cognitive awareness and anerobic power. There is a need to understand how various beverage content can influence fluid absorption and hydration status at rest. Therefore, the purpose of this study is to determine the effect of three different beverages following an 8-hour fluid restriction.10 physically active participants (N= 7 Males, N=3 Females) completed a randomized cross-over study. Each trial took place after 8 hours of fluid restriction and each trial was separated by at least 3 days. Participants consumed 500mL of water the morning of the trial before arriving to the lab. Participants consumed one of the following 1.0 L beverages at the start of each trial: 1) Distilled water (CON), 2) Protein (PRO) and 3) Protein + Sodium (PRO + Na). The protein dose in PRO and PRO + Na was 0.4 g/kg of body mass. A commercially available electrolyte mix (LMNT) was added to the PRO + Na beverage. Participants collected urine at 60, 120, 180, and 240 minutes after fluid ingestion for each trial. Cumulative urine volume (CUV), net fluid balance (NFB) and beverage hydration index (BHI) were calculated. CUV was significantly lower in both PRO and PRO + NA trials compared to CON at 120-, 180-, and 240-minutes post beverage ingestion ($p < 0.05$). There was no difference in CUV between PRO and PRO + Na at any time point ($p > 0.05$). NFB was significantly higher in PRO and PRO + Na compared to CON at 120-, 180-, and 240-minutes post beverage ingestion. There was no difference in NFB between PRO and PRO + Na at any time point ($p > 0.05$). BHI was not different between the beverages at any time point ($p > 0.05$). In conclusion, PRO and PRO + Na may both be appropriate beverage choices to promote fluid absorption and hydration.

P314: CORRELATION BETWEEN THE BEVQ-15 AND HYDRATION MEASURES IN LACTATING WOMEN

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The BEVQ-15 is 15-item food frequency questionnaire that was designed to rapidly assess habitual beverage consumption and has been validated for use in both children and adults. However, its utility for predicting hydration status in lactating women has not been evaluated, despite the tendency for this population to develop hypohydration secondary to fluid demands of breast milk production. The purpose of this study was to examine the correlation between the BEVQ-15 and various hydration measures (urine specific gravity [USG], urine color [UC], and number of voids [NoV] in 24-hr). Lactating women who were at least three months postpartum and providing the majority of their baby's calories from breastmilk (< 148 mL of supplemented formula) were enrolled in the study. Participants completed the BEVQ-15 prior to the lab visit. Participants then collected urine for 24 hours in a urine collection jug and were also instructed to record the number of voids in that 24-hour period. A sample of first morning urine was also collected by the participant. First morning USG (mean ± SD, 1.016 ± 0.003) and 24-hour USG (mean ± SD, 1.013 ± 0.004) indicated that these participants were euhydrated. Fist morning UC (mean ± SD, 3 ± 1) and 24-hour UC (mean ± SD, 2 ± 1) also indicated that these participants were euhydrated. The number of voids were also recorded (mean ± SD, 8 ± 2). Pearson correlation coefficients were calculated to evaluate relationships between variables. There were moderate negative correlations between first morning urine USG and BEVQ-15 score (-0.53; $p>0.05$) and between first morning color and BEVQ-15 (-0.48; $p>0.05$). In summary, the BEVQ-15 may provide some insight into the hydration status of lactating women, however, future research with additional participants is needed to confirm the usefulness of this tool in this population.

P315: BODY COMPOSITION AND NUTRITION ASSESSMENT: MACRONUTRIENT TRACKING INTERVENTION AMONG DIVISION-III FOOTBALL ATHLETES

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BACKGROUND: The distribution of macronutrients in an individual's diet significantly impacts body composition, overall health, and performance. These effects are particularly important for athletes striving to meet specific body composition and performance goals. However, the nutrition and dietary patterns of Division III football players remains largely understudied, despite the unique demands placed upon these student athletes. The purpose of this study was to determine the effects of a 10-week macronutrient tracking intervention on body composition in Division III football athletes. METHODS: Thirty-three participants (age = 19.4 ± years, height = 183 ± 5 cm, %BF = 23.3 ± 9.2) completed a PRE- and POST- intervention DEXA to determine body composition. Each player received personalized macronutrient intake recommendations (PRO: 1.2-1.4 g/kg/day, CHO: 5-7 g/kg/day, FAT: 20-35% of total kcals) for the 10-week intervention with instructions to log daily intake using MyFitnessPal. Separate linear regressions were run to assess the % adherence to each macronutrient recommendation as predictors of the change in Fat Mass and in Fat-Free Mass, respectively. RESULTS: Overall, compliance with macronutrient recommendations was low (PRO = 9.85 ± 5.28%, CHO = 4.39 ± 4.17 %, FAT = 11.3 ± 6.78%). Greater compliance with recommendations was not associated with change in Fat Mass with PRO ($F(1, 31) = 0.009$, $p = 0.927$, $R^2 = 0.0003$), CHO ($F(1,31) = 0.590$, $p = 0.448$, $R^2 = 0.019$), or FAT ($F(1,31) = 0.662$, $p = 0.422$, $R^2 = 0.021$). Greater compliance with recommendations was not associated with change in Fat-Free Mass for PRO ($F(1,31) = 0.142$, $p = 0.709$, $R^2 = 0.005$), CHO ($F(1,31) = 0.157$, $p = 0.695$, $R^2 = 0.005$), or FAT ($F(1,31) = 0.584$, $p = 0.451$, $R^2 = 0.018$). CONCLUSIONS: Adherence to macronutrient recommendations was generally low among Division III football athletes in this investigation. Additionally, greater compliance with protein, carbohydrate, and fat recommendations did not significantly predict changes in either Fat Mass or Fat-Free Mass over the intervention period. Future research should explore alternative strategies to improve compliance in this population, ensuring athletes receive proper nutrition to support their body composition and performance goals.

P316: MOMENT TO MOMENT CHANGES IN RER COINCIDENT WITH THE CHANGE FROM SEATED REST TO WALKING

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BACKGROUND: Anecdotally, in labs designed to show change on O2 use because of the transition from seated rest to walking, we noticed that RER ($VCO2 \bullet VO2^{-1}$) *decreased* in the first 2.5 minutes (m) of the transition to walking. This is opposite of accepted conventional wisdom (CW), teaching, and research in exercise science. RER has been used widely to show the reliance on CHOs (higher RER) for fuels as one initiates physical activity (PA) and then fats (lower RER) are used as PA continues at a mild pace. The decrease, we hypothesized, could be due to enhanced metabolism of walking or change in posture. In a prior study, we showed that moving from a seated position to standing increased RER, as CW predicts. Therefore, this study endeavored to reveal RER changes as one moves from seated rest to walking. METHODS: Participants (3F, 4M, age 21.6±0.8 y) rested in a seated position atop a treadmill for 25 m to establish steady state. Then, after being fitted for heart rate (bpm, Polar ®) and gas collection/analyses using Parvomedics TrueOne 2400 ® met cart, they sat for another 7m, and then stood and walked at 3 mph for 7m. RESULTS: Preliminarily (we intend to collect data from 10+ more participants), RER increased from 0.821±0.127 (mean±SD) during seated rest to 0.871±0.118 at time 60s of walking and then decreased to 0.709±0.047 at time 120s of walking. From there, RER increased gradually. CONCLUSION: Initially, RER increased as expected from CW. However, there was a pronounced decrease from time point 60s to 120s of walking. This is counter to CW, as is the continuous rise in RER for the remainder of the 7 m walking period. CW, from various papers and texts, suggests that RER should increase up to the first 2 to 3 minutes of PA and then slowly decrease. This has implications for RER use as a surrogate for fuel use.

P317: PROLONGED PASSIVE VS. ACTIVE STANDING: INFLUENCE ON DISCOMFORT, PHYSICAL FATIGUE, AND MENTAL FATIGUE

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BACKGROUND: Standing to break up prolonged sedentary behavior shows conflicting results for cardiovascular, metabolic, and musculoskeletal outcomes due to previous studies defining all standing as the same behavior. We propose that passive standing (standing still) differs from active standing (standing with micro-movements and weight-shifting). This study aims to determine if active standing for 120 min benefits musculoskeletal ratings of discomfort, physical fatigue, and mental fatigue compared to passive standing. **METHODS:** Ten participants (27.7±5.6 yr) enrolled in a randomized crossover study that utilized two conditions of either 120 min of PASSIVE or ACTIVE standing. ACTIVE included 10 min of standing on a dynamic active standing board (Movemate) every 30 min to promote weight-shifting and micromovements. Measures of discomfort, physical fatigue, and mental fatigue were assessed at baseline, 60 min, and 120 min utilizing 100-point visual analog scales (VAS). Repeated measures ANOVA (0 between, 2 within) were used to determine differences in variables across conditions and time (alpha=0.05), with Bonferroni pairwise comparisons conducted post hoc as needed. **RESULTS:** A significant time x condition interaction was observed for discomfort (PASSIVE: 10.7±10.1, 21.7±10.9, 35.7±15.6; ACTIVE: 7.5±8.8, 13.6±11.9, 21.6±14.6, p=0.031), physical fatigue (PASSIVE: 11.5±11.4, 19.4±12.5, 29.7±15.4; ACTIVE: 8.9±9.8, 13.1±8.9, 16.2±10.8, p=0.001), and mental fatigue (PASSIVE: 13.8±16.2, 20.4±17.8, 26.6±20.9; ACTIVE: 9.9±11.2, 9.0±6.9, 12.9±9.2, p=0.029), where all variables increase over time at a slower rate in ACTIVE compared to PASSIVE. Post hoc comparisons revealed significant differences at 60 min for physical fatigue (p=0.001), and 120 min for discomfort (p=0.017) and physical fatigue (p=0.002) with lower values in ACTIVE. **CONCLUSION:** Active standing benefits subjective ratings of discomfort, physical fatigue, and mental fatigue compared to passive standing.

P318: CONTRASTING IMPLICIT ASSOCIATIONS FOR EXERCISE AND DANCE IN OLDER ADULTS: PROTOCOL FOR A CROSS-SECTIONAL STUDY

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BACKGROUND: Regular physical activity is a key contributor to health and quality of life in older adults. However, few methods have been successful in engaging the inactive population. Dance has been associated with high levels of enjoyment and increased intrinsic motivation, yet many choose not to participate. Implicit associations result from a series of conscious and unconscious processes that influence behavior and choices. The purpose of this study is to investigate conscious and unconscious biases towards dance using implicit association testing, and further investigate how to expand the use of dance as a mode of physical activity. METHODS: Participants will be community-dwelling older adults aged 65 and older. There will be a targeted recruitment of approximately half who are actively engaging in some form of dance. These participants will be recruited through flyers, emails, and in-person information sessions. Participants will complete an entry survey to collect demographic information. Participants will engage in computerized implicit association testing contrasting walking verses social dance, walking verses performance dance, resistance training verses social dance, and resistance training verses performance dance. Following these tests, participants will complete questionnaires related to current participation in physical activity, exercise, and dance. RESULTS: Results are expected by Spring, 2025. CONCLUSION: The results of this study will help to more successfully promote dance to the general population as a mode of physical activity. This information will also allow us to find engaging ways to implement dance into more research studies and understand the main reasons people tend to avoid it.

P319: EFFICACY OF AN 8-WEEK "THRIVEWELL" PROGRAM ON MITIGATING THE RISK OF METABOLIC SYNDROME IN WOMEN

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BACKGROUND: Metabolic syndrome (MetS) is a group of conditions including hypertension, hyperglycemia, hyperlipidemia, low HDL-C and abdominal obesity that increase the risk of cardiovascular disease (CVD), Type II Diabetes, and premature mortality. The purpose of this study was to assess the efficacy of an 8-week nutrition and physical activity education program (ThriveWell) in mediating behaviors associated with MetS risk development. METHODS: 16 female participants (age 44 ± 14 y; BMI 33.7 ± 4.9 kg/m2) were recruited to participate in the ThriveWell program, consisting of weekly 60 min group education and 30 min coaching/goal setting small group sessions. All assessments were completed pre and post intervention. Participants' body composition was assessed using Dual Energy X-Ray (DXA) and waist circumference. Systolic and diastolic blood pressure were measured via an automated blood pressure cuff. Lipids and fasting blood glucose levels were collected via venous blood draw and analyzed using Piccolo Xpress. Behavioral surveys assessed physical activity, eating habits, and sleep quality. The Automated Self-Administered 24-Hour Dietary Recall (ASA-24) was used to determine Healthy Eating Index (HEI) scores. The International Diabetes Federation (IDF) criteria was used to assess MetS risk. RESULTS: A 38% reduction in participants meeting MetS criteria was observed from pre to post intervention (p=0.028). There was a significant change in HEI (55 ± 18 vs 64 ± 19; p=0.05) scores, weight (91.8 ±17.3 vs 89.3 ± 17.1 kg; p=0.0014), total fat mass (43.5 ± 11.9 vs 42.2 ± 11.6 kg; p=0.006), systolic (134 ± 21 vs 127 ± 16.6 mmHg; p=0.038) and diastolic (87 ± 11 vs 79 ± 14 mmHg; p=0.001) blood pressure. CONCLUSION: The ThriveWell program appeared to be effective in changing dietary behaviors leading to a reduction in MetS risk factors in this group. Funding was provided by the Elon University Undergraduate Research Program.

P320: EXPLORING FOOD ACCESS AND BEHAVIORAL FACTORS IMPACTING METABOLIC SYNDROME RISK IN THE LATINO COMMUNITY

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BACKGROUND: Metabolic Syndrome (MetS) is a set of at least three cardiovascular disease risk factors including high levels of triglycerides, blood glucose, blood pressure, and abdominal fat and low high-density lipoproteins (HDL). Within the U.S., the incidence of MetS has been steadily increasing, with some of the highest rates seen in the Latino population. Behavioral habits strongly impact the risk of MetS. A contributing factor among the target Latino community in this study may be food insecurity. Local survey data suggests that over 22,000 Latino residents report food insecurity. The purpose of this study is to investigate the interactions between behavioral, environmental, and socioeconomic factors affecting MetS risk in Latino population. METHODS: A cross-sectional study will include 40-50 local Latino adults 18-75 years of age. Blood glucose and lipid profile will be assessed via venous blood draw and analyzed with Piccolo Xpress. Systolic and diastolic blood pressure will be measured via an automated blood pressure cuff. Bioelectrical impedance (BIA) and waist circumference will be used to measure body composition. The International Diabetes Foundation (IDF) criteria will be used to identify MetS. Diet quality will be assessed using the Automated Self-Administered 24-hour Dietary Assessment tool (ASA-24). Qualtrics surveys will assess factors associated with MetS including socioeconomic status, food access, perceived stress, dietary, physical activity, and sleep habits. Multivariate logistic regression analysis will be used to identify factors associated with the development of MetS with significance set at p0.05. ANTICIPATED RESULTS: We expect to identify unique factors associated with the development of MetS in the local Latino population. Food access is likely to be a major contributor to the development of MetS. In addition, we intend to assess potential mediating effects.

P321: OLDER ADULTS' PERCEPTIONS OF THE STUDENT-LED FAU WELL PROGRAM: A QUALITATIVE STUDY

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Background: Regular participation in physical activity poses numerous health and functional benefits for older adults, yet a substantial portion of older adults remain inactive. One way to promote physical activity is through structured student-led physical activity programs. The Florida Atlantic University (FAU) Well program is a faculty-supervised, student-led exercise program where students interact directly with older adults, providing them with guided exercise instruction. Limited research exists exploring older adults' experiences with a student-led community-based exercise program. Therefore, the purpose of this study is to explore older adults' perceptions of and experience with the FAU Well program. **Methods:** Older adults who currently or previously participated (within the last two years) in the FAU Well program will be recruited for this qualitative study. Participants will complete a semi-structured qualitative interview with questions focusing on their experiences with the program and how it has influenced their physical activity, health, and fitness. Interviews will be transcribed and analyzed using first and second cycle coding to identify emergent themes. **Anticipated Results:** We hypothesize that participants will report satisfaction with the FAU Well program, enjoyment from working with students, and benefits of the social, intergenerational environment. In addition, we anticipate participants will report increased physical activity levels and improved cardiovascular fitness, strength, and physical function. Based on our previous qualitative studies with older adults, we also anticipate qualitative themes that highlight participants' perceived value of physical activity and improved self-efficacy for exercising.

P322: PHYSICAL THERAPY INCORPORATING EQUINES: NEUROLOGICAL ACTIVATION AND BALANCE DYNAMICS IN ADULTS WITH AUTISM SPECTRUM DISORDER

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BACKGROUND

In recent years, the number of adults within the United States with autism spectrum disorder (ASD) has continued to increase. This reality elevates the need for effective treatment options for individuals impacted by the mental health disorder. Therapy incorporating equines is one approach for achieving positive outcomes for individuals with disabilities. The data, though, have mostly been qualitative. More quantitative data are needed to ensure optimization of therapeutic protocols; specifically, data regarding the neurological activity of individuals with ASD as they interact with horses in a physical therapy environment could increase the efficacy of therapy programs that are

available. Recent technology has increased the attainability of the needed data, providing new ways to explore the impact of therapy incorporating equines in a more quantitative manner.
METHODS
Participants will be 1) adults without a diagnosis of any mental health disorder and 2) adults with a diagnosis of ASD, placed into separate groups. Both will complete a series of sessions that include a randomized order of activities, with each activity being followed by a firm-surface balance test. During the activities, participants will wear a mobility-enabled electroencephalogram (EEG) helmet (zEEG, Zeto One, Zeto, Inc., Santa Clara, CA). Activities will consist of sitting, walking, and riding a horse according to guidelines for physical therapy incorporating equines from the Professional Association of Therapeutic Horsemanship, International. For the balance tests following each activity, participants will wear sensors (BalanSens, BioSensics, LLC, Newton, MA) designed to capture center of motion, anterior-posterior motion, lateral-medial motion, reciprocal compensatory index, and sway velocity.
ANTICIPATED RESULTS
Due to differences in neurological activity that have been noted in individuals with ASD, we anticipate differences in the EEG data resulting from the two groups. For individuals with ASD, however, we expect to see greater levels of activation of balance- or coordination-related brain regions as a result of riding horses. Additionally, we predict that for both groups balance skills may be higher after horse riding compared to after the other activities, and especially higher for individuals with ASD.

P323: OBSERVING CORRELATION BETWEEN GYM MEMBERSHIP PRICES AND MEMBER ATTENDANCE

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BACKGROUND: Exercise facilities often have a large variance between membership prices that does not always directly align with amenities or equipment offered. With an abundance of facilities located within a small geographical area, it is beneficial for a facility owner to know what membership will entice the most members to sign up initially and stay over a longer period of time. Studies have shown the variance in prices and membership at large, but there is minimal data currently available that shows the connection between prices and long-term member retention. **METHODS:** Owners of 25 private gym facilities that offer monthly membership packages will be recruited for this study. Each facility will be asked to provide their membership data for a calendar year including the number of current members, new members, members lost, and any membership price changes that occurred during the year. **ANTICIPATED RESULTS:** The expected results are that a higher price will lead to more long-term membership due to the level of commitment that comes with a higher price. It is hypothesized that members of a low-priced gym will register for and cancel memberships more frequently, while those paying a premium price will either cancel after the first month or be more likely to renew monthly.

P324: EXPLORING ENERGETIC AROUSAL DURING PHYSICAL ACTIVITY IN WOMEN WITH PREGNANCY HYPERGLYCEMIA, DOES THE TIMING MATTER?

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Background: Physical activity (PA), a non-pharmacological treatment, is recommended for individuals with pregnancy hyperglycemia to help manage glucose levels. However, PA levels are typically low during pregnancy. Energetic arousal (a dimension of affective well-being) encompasses feelings that range from energetic (positive) to worn-out (negative). Outside of pregnancy, increased energetic arousal is associated with increased PA; it may potentially be leveraged for PA promotion and maintenance in individuals with pregnancy hyperglycemia. To the best of our knowledge, there are no data examining whether the timing of PA relates to energetic arousal in this population, thus the aim of this study is to assess the potential influence of PA timing on energetic arousal. **Methods:** Data come from the Time to Move Randomized Crossover Trial (Clinicaltrials.gov NCT06125704), which is comparing 30 minutes of moderate-intensity walking in the morning (i.e., between 5-9am, and within 30-40 minutes of starting breakfast) versus 30 minutes of moderate-intensity walking in the evening (i.e., between 4-8pm, and within 30-40 minutes of starting dinner). Participants are pregnant individuals diagnosed with gestational glucose intolerance or gestational diabetes mellitus, who are receiving care at the University of Tennessee Medical Center. Energetic arousal during PA is evaluated via e-survey (by cell phone), within 2 hours of completing the PA. It is assessed using two items for the extremes of the energetic arousal scale (i.e., during my walking, I felt 'energetic' or 'worn-out', each on a 6-point scale representing 'definitely not' to 'extremely'). Due to the ordinal nature of the data, Wilcoxon Signed-Rank Tests will be used to compare energetic arousal metrics for morning vs. evening PA. **Anticipated Results:** Fatigue is common is late pregnancy, so it is hypothesized that morning PA will be associated with feeling more energetic and less worn out, as compared to evening PA.

P325: DIVERGENT RESPONSES IN CORTICOSPINAL AND PERIPHERAL EXCITABILITY THROUGHOUT ACUTE FATIGUING EXERCISE IN RESISTANCE TRAINED MEN

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Purpose: To examine the effects of fatiguing exercise on maximal strength, performance, and corticospinal and peripheral excitability of the knee extensors. Methods: 11 resistance trained men (age = 24 ± 3 yrs) performed maximal voluntary contractions (MVCs) of the knee extensors on a dynamometer before (PRE), immediately after (POST), and 5 minutes after (POST5min) either an experimental fatiguing (EXP) or a non-fatiguing (CON) protocol. During the EXP visit, participants performed 3 sets (S#) of submaximal contractions to failure at 50% MVC with 5 min of rest after each set. At PRE, each rest, and POST5min, magnetic stimulation was performed over the motor cortex and femoral nerve to examine peak-to-peak motor evoked potential (MEP) and muscle compound action potential (M-Wave) amplitude of the vastus lateralis, respectively. MEP and M-Wave amplitudes were recorded via surface electromyography and normalized to PRE. A 2-way repeated measures (RM) ANOVA (condition [EXP, CON] x time [PRE, POST, POST5min]) was used for MVC. A 1-way RM ANOVA (time [S1, S2, S3]) was used for number of contractions completed. 2-way RM ANOVAs (condition x time [PRE, S1, S2, S3, POST5min]) were used for MEP and M-Wave amplitude. Results: For MVC, MEP, and M-Wave, there were 2-way interactions ($p < 0.05$). For both conditions, MVC at PRE was greater than POST and POST5min ($p < 0.05$). However, MVC increased from POST to POST5min only for EXP ($p < 0.05$). MVC at POST and POST5min were lower for EXP than CON ($p < 0.05$). For EXP, MEP after S1 was lower than PRE and POST5min ($p < 0.05$), whereas MEP after S2 was lower than POST5min ($p < 0.05$). For EXP, M-waves after S1-3 were lower than PRE ($p < 0.05$). There was a 1-way interaction for repetitions completed ($p < 0.05$). Repetitions for S1 was greater than S2 and S3, and S2 was greater than S3 ($p < 0.05$). Conclusion: The initial decrease in corticospinal and peripheral excitability may be due to the greater number of repetitions completed during the S1. Although no reduction was observed in corticospinal excitability after S1, endurance performance continued to decrease in the subsequent sets likely the result of peripheral fatigue as M-Wave remained reduced after each set. Yet, excitability returned to proximal pre-exercise levels after POST5min. Thus, reduced POST5min torque output may be due to mechanical parameters.

P326: THE IMPACT FATIGUE HAS ON BALANCE EQUILIBRIUM SCORES WITHIN COLLEGIATE CLUB SOCCER PLAYERS

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BACKGROUND: Soccer players run various distances at different intensities throughout the season. However, it is unclear how these differing distances and intensities affects a club soccer players postural sway. The purpose of this study is to determine how aerobic fatigue impacts postural stability within collegiate club soccer players. **METHODS:** Eleven male collegiate club soccer players (age: 19.73 ± 1.27 years, height 178.10 ± 5.99 cm, mass: 72.64 ± 9.21 kg) underwent a Sensory Organization Test (SOT) on a NeuroCom® Balance Master®, consisting of 3 trials for each of the 6 different conditions while barefoot. These conditions include: (1) eyes open,

fixed surface, (2) eyes closed, fixed surface, (3) eyes open, sway-referenced vision, (4) eyes open, sway-referenced support, (5) eyes closed, sway-referenced support, and (6) sway-referenced vision, sway-referenced support. To mimic a soccer match, participants then completed a VO_{2max} treadmill test following the Costill and Fox (1969) protocol for highly trained athletes with the speed remaining constant at 3.98 m/s and the incline increasing 2% every two minutes. Participants were instructed to run for as long as they could while reporting RPE every 2 minutes, with the goal of reaching maximum volitional exhaustion. Following the treadmill test, another SOT was performed. The overall equilibrium scores on the SOT were derived from the scores across all conditions, providing a comprehensive assessment of a participant's ability to use their visual, somatosensory, and vestibular systems to maintain an upright position. A paired sample t-test with an alpha level of $p<0.05$ was used to compare pre- and post- equilibrium scores **RESULTS:** There was no significant difference ($p=0.43$) in composite equilibrium scores between pre-fatigue (78.73 ± 6.39) and post-fatigue (80.18 ± 6.10) conditions. **CONCLUSION:** Aerobic fatigue does not impact posterior and anterior sway in collegiate club soccer players.

P327: VOLLEYBALL FOOTWEAR AND ANKLE BRACING: ITS IMPACT ON FORCE PRODUCTION, POSTURAL CONTROL, AND MUSCLE ACTIVITY

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BACKGROUND: In the past four decades, Division-I women's volleyball participation and sponsoring institutions has grown by 100.3% and 46.9%, respectively. Injury rates have also risen with ankle and knee injuries being the most prevalent. To limit these injuries, various ankle braces were designed to reduce the rate of injuries and increase dynamic stability. However, it is unknown how the interaction between an ankle brace and footwear alters performance. Therefore, this study aims to assess how footwear and ankle bracing influences force production, postural control, and muscle activity in collegiate female club volleyball players. METHODS: Twenty participants between the age of 18 and 25 will be recruited. All must be on the active roster and wear volleyball footwear and, or, ankle braces for at least 2 hours a week. The barefoot control session will first have participants sign an informed consent form and researchers will collect descriptive data. Participants will then complete a dynamic warm up with no constraint on time followed by three maximal voluntary isometric contractions (MVIC) for each of the four muscle groups, bilaterally: vastus medialis, semitendinosus, tibialis anterior, and medial gastrocnemius. Participants will then complete three vertical jumps and three, three-step approach jumps on a force platform with 30 second rests between jumps. After the 6 total jumps, participants will perform the sensory organization test (SOT) and limits of stability (LOS) test on the NeuroCom® Balance Master®. At least 24 hours later, participants will complete the same protocol in the remaining four conditions separated by 5 minutes of rest without shoes: low-top shoe, high-top shoe, low-top with ankle brace, and high-top with ankle brace. Afterwards, participants will complete a series of follow-up questions to gauge player perception and preference. A 2x5 RMANOVA with an alpha level set at 0.05 will be used to measure postural sway, mean mm activity, and mean MIVC activation. ANTICIPATED RESULTS: It is hypothesized that the presence of bracing and a high shoe collar height will decrease the activation of the tibialis anterior and gastrocnemius and in turn decrease postural control. FUNDING INFORMATION: This study is funded through Elon University's Faculty Research & Development committee.

P328: ASSESSMENT OF SAGITTAL PLANE HIP POWER IN AGING ADULTS WITH RADIOGRAPHIC HIP OSTEOARTHRITIS

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BACKGROUND: People with hip osteoarthritis (OA) ambulate with lower peak hip extension moments and angles yet the impact of hip OA on hip joint power is not well understood. Assessment of hip joint power may provide information regarding alterations in energy generation and dissipation during walking in people with hip OA. Therefore, the purpose of this study was to assess sagittal plane hip joint angles, moments, and power during walking in people with hip OA and asymptomatic, healthy controls. METHODS: Nine people with radiographic hip OA (5 females, 62.9±7.4years, 26.0±3.3 kg•m-2) and nine asymptomatic controls without radiographic hip OA (6 females, 57.2±11.2 years, 26.0±2.0 kg•m-2) participated in this cross-sectional study. 3D gait analysis and an instrumented treadmill were used to capture walking mechanics at a self-selected speed. Sagittal plane peak hip joint angles, internal moments, and power during the stance phase were assessed. Subjects also completed the Hip disability and Osteoarthritis Outcome Score (HOOS) to assess self-reported hip pain. Independent t-tests and chi-square tests were used to assess group differences in demographics, and an analysis of covariance, adjusting for gait speed, was used to assess between-group differences in hip mechanics. HOOS scores were compared between groups using a Kruskal-Wallis test. Spearman's rho correlations were used to assess the relationship between significant gait parameters and HOOS pain sub-scores. Significance was set at $p<0.05$ for all statistical tests. RESULTS: There were no between-group differences in HOOS pain scores, kinematics, or power. The hip OA group ambulated with a slower speed ($p = 0.03$) and a 54% lower peak hip extension moment compared to the control group ($p = 0.007$). CONCLUSIONS: People with hip OA walk at a slower speed and with lower peak hip extension moment, which may be a compensatory mechanism to reduce hip pain and to walk with similar hip joint power as people without hip OA. Grant or funding information: NIH (K23-AT011922, K01-AG073698)

P330: ACCLIMATIZATION TO MINIMALIST FOOTWEAR: IMPACT ON FOOT STRUCTURE AND GAIT BIOMECHANICS

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BACKGROUND Acclimatization to minimalist footwear is increasingly studied in biomechanics for its potential effects on foot structure and function, particularly in clinical sport performance. This study evaluates the impact of prolonged use of minimalist footwear on foot structure and gait biomechanics. METHODS Twenty-three physically active adults (15 males, mean age 26.1 ± 5.4 years) participated in an 8-week intervention wearing minimalist shoes (Vivo: Vivobarefoot Primus Lite III). Data were collected during five laboratory visits (days 0, 7, 14, 28, and 56), where participants' foot measurements and gait analyses were obtained. Participants completed 15 walking trials per condition (barefoot, Vivo, and typical shoes) at a self-selected gait speed over an instrumented walkway (ProtoKinetics, Inc., 2023, 4.9 meters). Integrated pressure was analyzed for all three conditions using a mixed-effects model to account for between-participant variations. Barefoot was set as the reference condition, and alpha level 0.05 was chosen for statistical significance. RESULTS Integrated pressure decreased for barefoot and Vivo condition (by 2.10% and 0.77% respectively; $p < 0.05$), while typical shoes showed negligible increased change (0.01%). Arch height standing showed no significant change across visits ($p > 0.05$), with percent differences ranging from -0.70% to 0.41%. Arch compliance initially increased by 27.31% at visit 2 but decreased by 15.07% by visit 5, approaching statistical significance ($p = .094$). CONCLUSIONS Prolonged use of minimalist footwear leads to significant reductions in integrated pressure, indicating beneficial adaptations in gait biomechanics. The observed trend toward decreased arch compliance suggests potential enhancements in arch stability, although these changes did not reach statistical significance within the study period. These findings support the use of minimalist footwear in promoting natural foot function without compromising arch integrity. Further research is necessary to investigate the long-term effects on foot structure and athletic performance, particularly concerning arch compliance adaptations.

P331: OUTCOMES FOLLOWING AN EXERCISE PRESCRIPTION ON A 55-YEAR-OLD FEMALE WITH TYPE-1 DIABETES AND ADHESIVE CAPSULITIS

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BACKGROUND: Adhesive capsulitis (AC) is defined as stiffness and pain in the glenohumeral joint. There are no known published studies in peer-reviewed literature investigating outcomes following an Exercise Science (ES) exercise prescription for clients with AC. The goal of this case report is to describe the positive outcomes following a comprehensive exercise program designed by an ES student for a 55-year-old female with a 24-year history of AC who did not respond favorably to 6-weeks of physical therapy and standard medical care. Her goal was to return to normal work activities and household chores without pain or limitations to enhance her quality of life. METHODS: A focused history included a PAR-Q, Review of Systems screen, Health

History Questionnaire, Tampa Scale for Kinesiophobia (TSK), QuickDash (QD) Functional Outcome Measure, and the Shoulder Pain and Disability Index (SPADI). ES assessments included posture compression test, gait, ROM, palpation for trigger points, muscular strength, coordination, proprioception, push/pull test, and UE neural tension. Exercise prescription consisted of aerobic and resistance training, coordination, proprioception, flexibility, inhibition with a percussion "gun", and neural mobilization. RESULTS: The client reported a full return to normal functional activities, less fluctuation of blood sugar levels, and surprise with her improvements. Pre/post outcome scores are as follows: TSK 27% improvement, QD general and occupation scores 56% and 50% improvement respectively, and SPADI 41% improvement. Pain decreased from sharp pain to mild soreness. Upper quarter ROM increased by a mean of 50%, strength by 80%, coordination improved from poor to good, proprioception fair to good, and soft tissue sensitivity decreased from high to low. CONCLUSIONS: The aim of this case report was to report extremely favorable outcomes with an ES exercise prescription for a client who had a 24-year history of AC. Significant improvements were seen in both subjective and objective impairment measures, as well as validated functional scales. These gains highlight the value of a comprehensive ES assessment and exercise prescription for people with adhesive capsulitis. Further exploration into the benefits ES practitioners can provide to this population seems warranted.

P332: EFFECT OF POSTURE ON CARDIOPULMONARY AND PERCEPTUAL RESPONSES TO MAXIMAL INCREMENTAL EXERCISE

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BACKGROUND: Cardiopulmonary exercise testing (CPET) allows for quantification of cardiorespiratory fitness (CRF) and identification of dysfunctional cardiometabolic and ventilatory responses to exercise. Determining the extent of any CRF impairment relies on precise reference values for peak pulmonary oxygen uptake ($V\dot{O}_{2peak}$), typically standardized using age, sex, and exercise modality. However, body position (i.e., supine versus upright) affects physiological responses during CPET (e.g., increased preload and stroke volume while supine). Despite this, there are no widely recognized normal reference values for $V\dot{O}_{2peak}$ from supine CPET. Clinically, this is relevant for supine exercise tests (e.g., stress echo with CPET). Our primary aim is to characterize the cardiopulmonary and perceptual responses to CPET, with focus on $V\dot{O}_{2peak}$, in the upright versus supine position in healthy adults. We anticipate highlighting the need for and forming preliminary reference values for $V\dot{O}_{2peak}$ that account for body position to improve diagnostic accuracy and exercise prescription. METHODS: We will recruit 50 healthy male adults (ages 20-75 years) and 50 age-matched females. Utilizing a repeated measure, randomized crossover study design, participants will act as their own control and perform two ramp-incremental CPETs on a cycle ergometer in the supine and upright position. Cardiometabolic, ventilatory, and perceptual responses to exercise (e.g., $V\dot{O}_2$, blood pressure, heart rate, minute ventilation, O2pulse, rating of perceived dyspnea and leg discomfort) will be recorded. Two-way repeated measures ANOVA will be used to assess the effect of posture and sex on exercise responses. Follow-up pairwise comparisons will be adjusted using the Holm-Sidak correction. ANTICIPATED RESULTS: We anticipate lower $V\dot{O}_{2peak}$ and heart rate in the supine compared to the upright position due to reduced perfusion pressures in all participants, despite no changes in cardiorespiratory fitness. We expect lower $V\dot{O}_{2peak}$ in females compared to males in both upright and supine position due to lower stroke volume in females, with a similar decrease in both sexes in $V\dot{O}_{2peak}$ from the upright to supine position.

P333: NOX DOES NOT IMPACT BLOOD FLOW AT REST/POST PRANDIALLY IN OLDER INDIVIDUALS WITH OVERWEIGHT/OBESITY.

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BACKGROUND: Impaired blood flow and elevated reactive oxygen species (ROS) concentrations are risk factors for cardiovascular disease, the leading cause of death in the United States. In the vasculature system, ROS is predominately generated by NADPH oxidase (NOX). Major contributors to increased ROS production include aging, excess adipose tissue, and the consumption of high-carbohydrate (HC) meals. However, the extent to which NOX-produced ROS concentrations impairs skeletal muscle microvascular blood flow (SMMBF) is unclear. The current study sought to determine if NOX-derived ROS impairs SMMBF in older adults with overweight/obesity both at rest and following an HC meal. **METHODS:** Nine older individuals with overweight or obesity (6 females, 3 males, age: 67 ± 6 years, BMI: 30.9 ± 2.9 kg/m^2, 39 ± 7 % body fat) had two microdialysis probes—one control (CON) probe and one NOX-inhibiting probe perfused with apocynin (APO)—inserted in the gastrocnemius muscle. *In vivo* ROS (Hydrogen Peroxide (H_2O_2) concentrations and SMMBF (measured by ethanol outflow/inflow ratio (O/I)) were measured under fasted conditions and up to four hours after the consumption of an HC meal. Marginal models were used to determine the main effect and interaction effect of probe and time on H_2O_2 concentrations and SMMBF with α set at 0.05. **RESULTS:** At baseline APO perfusion did not lead to a significant decrease in ROS concentrations (mean difference ± standard deviation) {MD ± SD; CON-APO}:0.27±0.39 μM, probe p=0.08). SMMBF at rest was not different between the CON and APO perfused probes (diff 0.10 ± 0.09 O/I, probe p=0.06). Post HC meal consumption, APO perfusion led to significantly decreased ROS concentrations between 100-140, 160-240 mins post HC meal consumption (Probe*time p≤0.05). SMMBF was not significantly different between the APO and CON probe at any postprandial time point (Probe*time p>0.05). **CONCLUSIONS:** In older individuals with overweight/obesity NOX inhibition with APO did not appear to affect SMMBF at rest or up to four hours following a HC meal. These findings suggest that NOX-derived ROS may not play a critical role in impairing baseline and postprandial SMMBF in this population. **Grant or funding information:** This study was funded by The Florida State University IDEA Grant.

P334: ASSOCIATIONS OF ACTIGRAPHY-ASSESSED SLEEP VARIABLES WITH CARDIOMETABOLIC OUTCOMES IN EMERGING ADULTS

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BACKGROUND: Evidence suggests insufficient sleep (e.g., short sleep duration, poor sleep efficiency) is associated with increased cardiometabolic risk (CMR). Yet data on sleep and CMR in emerging adults (ages-18-25 years) is limited. PURPOSE: To assess cross-sectional associations between actigraphy-assessed sleep with CMR outcomes in emerging adults. METHODS: Data were collected in 145 emerging adults (age=19.4±1.3 years; fat mass index (FMI)=7.8±5.8 kg/m^2; 57.8% female; 65.3% White) from the RIGHT Track Health study. Actigraphy-based sleep measures included sleep duration (minutes/day) and sleep efficiency (sleep duration/time in bed; %). CMR outcomes included mean arterial pressure (MAP), and the following indices created using simple summation to assess cumulative risk: inflammatory index (interleukin (IL)-1 beta, IL-6, IL-10, tumor necrosis factor-alpha, interferon-gamma), clotting index (plasminogen activator inhibitor-1, anti-thrombin-lll), acute phase reactant index (CRP, uric acid, monocyte chemoattractant protein-1), and lipid index (triglycerides, total cholesterol). Linear regression models adjusted for age, sex, race, and FMI were used to measure associations. Akaike information criterion (AIC) determined the model of best fit. RESULTS: Mean sleep duration was 5.4 hours/night, while mean sleep efficiency was 86.9%. Sleep duration was positively associated with MAP (B= 0.089, [-0.0000424, 0.0002165 at 95%CI], p<0.001), the clotting index (B= 0.006, [-0.0004595, 0.0004916 at 95%CI], p=0.019), and the lipid index (B=0.012, [-0.0004379, 0.0005152 at 95%CI], p<0.001), while sleep efficiency was inversely associated to MAP (B= -0.060, [-0.003281, 0.00124 at 95%CI], p<0.001), the clotting index (B= -0.68, [-0.01183, 0.005325 at 95%CI], p=0.014) and the lipid index (B= -0.2, [-0.02010, -0.002890 at 95%CI]; p<0.001). Both sleep duration (B= -0.124, [-0.0009468, 0.0001090 at 95%CI], p<0.001) and sleep efficiency (B= -0.078, [-0.01435, 0.004840 at 95%CI], p<0.001) were also inversely associated with the acute phase reactant index. There were no significant associations between either sleep outcome and the inflammatory index. CONCLUSION: These data suggest that greater sleep efficiency, but not longer sleep duration, may be protective for CMR in emerging adults.

P335: INFLUENCE OF 16-WEEK MINIMAL EXERCISE INTERVENTION ON CARIOVASCULAR MEASURES IN TYPE-2 DIABETEICS

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Background: Diabetes is a metabolic condition with complications that strongly relate to cardiovascular function. Exercise is a commonly prescribed intervention to help improve metabolic and cardiovascular health in those with type two diabetes (T2DM). Resting heart rate variability (HRV) is a non-invasive indicator of autonomic nervous system (ANS) function which contributed to regulation of many physiological outcomes including metabolism. The purpose of this study was to evaluate non-invasive markers of cardiovascular health following a novel high-intensity bodyweight circuit (HIBC) intervention in participants with T2DM. Methods: Participants between the ages of 40-65 diagnosed with T2DM were recruited. Prior to the intervention, participants' systolic blood pressure (SBP), diastolic blood pressure (DBP), and resting heart rate (RHR) were collected via electrocardiogram (Finapres, NOVA). Participants were placed in a supine position in a dimly lit room for a 10-minute HRV recording. The final five minutes of the tracing was transferred to the online software Kubios HRV Standard (version 3.5.1) for analysis of HRV metrics: root mean square of successive differences (RMSSD), standard deviation of normal-to-normal sinus beats (SDNN), high frequency (HF), and low frequency (LF). Participants completed 16-weeks of HIBC training (10 banded bodyweight squats, 5 modified pull-ups, 5 modified push-ups, 10 abdominal crunches). Participants completed as many cycles as possible in each session. The duration progressed from 5-10 minutes, and the frequency progressed from 3-4 sessions per week, as tolerated. All assessments were repeated after 16-weeks of training. Results: A total of 7 participants completed the study: Female (n = 2) (54 +/- 5.6yr) Male (n=5) (53 +/- 1.5 yr). A paired samples t-test demonstrated no changes in markers of HRV: RMSSD (p=.633), SDNN (p=.990), HF (p=.724), LF (p=.542), LF/HF (p=.273); significant increase in RHR (p=0.05); and significant decrease in SBP (p=.023) and DBP (p=0.80). Conclusion: The HIBC did not appear to be effective in improving HRV measurements related to T2DM. However, the program did significantly improve SBP and trended decrease in DPB, which are important risk factors for cardiovascular disease, and may be a suitable program for those seeking to lower BP.

P336: INSURANCE TYPE AFFECTS ACCESS TO CARE FOR PATIENTS WITH HIP LABRUM TEARS

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PURPOSE: The purpose of this study was to determine if differences exist in insurance acceptance rates for Medicaid versus Blue Cross and Blue Shield (BCBS) for patients with a hip labral tear. METHODS: Across the United States, eight states were selected: Alabama, Arizona, Utah, Wisconsin, Virginia, Kentucky, Kansas, and Oregon. Twelve physicians from each state were randomly selected from the American Orthopaedic Society for Sports Medicine directory. Each physician's office was called attempting to make an appointment for a fictitious 16-year-old patient with a hip labral tear with Medicaid insurance. Three weeks after the initial call, a second phone call was placed to each physician's office attempting to make an appointment for a fictitious 16-year-old patient with a hip labral tear with BCBS insurance. No IRB approval was required for this study. RESULTS: 86 physicians were called in total. An appointment was able to be scheduled at 44 (51.2%) and 64 (74.4%) offices when calling as patients with Medicaid and BCBS insurance, respectively($p<0.0001$). Patients with Medicaid insurance were more likely to schedule an appointment in states with an expanded Medicaid status. There was no significant difference in the number of days it took to acquire an appointment. The most common reason for appointment denial for patients with Medicaid insurance was missing the requirement of primary care referral. CONCLUSION: For young athletes with hip labrum tears, it is more difficult to schedule appointments with Medicaid insurance compared with BCBS insurance. The main barrier to care for Medicaid patients is requiring a PCP referral.

P337: DO THE EATING BEHAVIORS OF PRESCHOOL-AGE CHILDREN DIFFER BY FOOD INSECURITY STATUS?

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Background: Approximately 17% of US households with children experience food insecurity (FI), the inability to access enough food to support a healthy lifestyle. Parents in households experiencing FI are more likely to restrict their children's access to food when resources are scarce and pressure children to overeat when food is available. These practices disrupt children's ability to self-regulate their intake and are related to problematic eating behaviors. We aim to evaluate if child eating behaviors differ by FI status. Methods: Parents (n=25; Xage=35 years) of preschool age (2-5 years) children (Xage= 3.6 years; 48% non-Hispanic White, 20% Hispanic, 20% non-Hispanic Black, 12% other) completed electronic surveys in March/April 2024. Surveys included The USDA 18-item Household Food Security Survey (HFSS) and The Children's Eating Behavior Questionnaire (CEBQ). Those who responded affirmatively to 3 or more HFSS items were classified as living in a household experiencing FI; 2 or fewer items were considered food secure (FS). Scores were calculated for the following CEBQ subscales: food responsiveness, food fussiness, enjoyment of food, satiety responsiveness, emotional undereating, desire to drink, and slowness in eating. Higher scores indicate a greater tendency toward the respective subscale. Due to small sample size, descriptive statistics and effect sizes are presented. Results: The majority of the sample was classified as FI (56%). Parents reported greater food fussiness [FI 3.2 (0.7); FS 2.7 (0.7); cohen's d 0.7], lower enjoyment of food [FI 3.5 (0.6); FS 4.0 (0.7); cohen's d 0.8], higher satiety responsiveness [FI 3.2 (0.6); FS 2.9 (0.6); cohen's d 0.5], and faster eating [FI 2.7 (0.7); FS 3.1 (0.9); cohen's d 0.4] among children living in FI households compared to their FS counterparts. In contrast, food responsiveness, emotional undereating, and desire to drink were similar across FI status: (cohen's ds ranged .06-.09).
Conclusion: Preliminary findings indicate that children living in households experiencing FI may exhibit more unhealthy eating behaviors. It is possible these behaviors result from the experience of FI (inconsistent access to food; limited variety). Addressing FI may promote healthier eating behaviors among preschoolers.

P338: IMPACT OF PHYSICAL ACTIVITY ENGAGEMENT ON ABILITY TO PERFORM ACTIVITIES OF DAILY LIVING AMONG CHILDREN: 2016-2022 NSCH

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Background: Activities of daily living (ADL) difficulties, such as dressing and bathing, are well studied in older adults. While physical activity (PA) is known to reduce ADL difficulties in older adults, limited research has examined this relationship in children. This study investigates the association between PA and difficulties in dressing or bathing among children aged 0-17 years.**Methods:** This cross-sectional secondary data analysis used the 2016-2022 U.S. National Survey of Children's Health. Children were classified as engaging in PA if they reported at least 60 minutes of PA on any day. ADL difficulties were self-reported. Bivariate and multivariable logistic regression analyses were performed, controlling for demographic factors. The alpha level was set at 0.05.**Results:** A total of 185,549 children with an average of 12.02 (IQR: xx-xx) years old were included. Of these, 89.61% (95% CI [88.96, 90.24]) of participants engaged in PA, while 10.39% (95% CI [9.76, 11.04]) did not. When stratified by PA engagement, 4.65% (95% CI [3.92, 5.38]) of participants who did not engage in PA, and 1.39% (95% CI [1.28, 1.51]) of those who did, reported ADL difficulties. Both unadjusted and adjusted analyses showed that children who engaged in PA were less like to experience ADL difficulties (OR=0.29, 95% CI [0.25, 0.33]; aOR = 0.29, 95% CI [0.20, 0.41]).**Conclusion:** Physical activity is strongly associated with fewer ADL difficulties in children. Regular PA supports the development of physical capabilities necessary for self-care tasks, enhancing independence, confidence, and autonomy.

P339: EXPLORING ASSOCIATIONS BETWEEN HANDGRIP STRENGTH AND METABOLIC SYNDROME RISK FACTORS IN RURAL FIREFIGHTERS

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BACKGROUND: Higher relative handgrip strength is positively associated with greater occupational task performance among firefighters, but its usefulness as an indicator of cardiometabolic health within the fire service has received minimal investigation. This study aimed to evaluate the association between relative handgrip strength and metabolic syndrome risk factors among rural firefighters. METHODS: Forty-five career male firefighters (36 ± 8.9 years, 29.3 ± 5 kg/m2) participated in annual health and fitness assessments aligned with National Fire Protection Association guidelines. Handgrip strength was assessed while standing with the elbow flexed at 90 degrees using a hand dynamometer. Two measurements were taken for both dominant and nondominant hands. Peak values from each hand were summed and then divided by body mass to obtain relative values. Metabolic syndrome risk factors were obtained from a health assessment conducted by a contracted medical doctor. Multiple regression analyses were performed to quantify age-adjusted associations between variables. RESULTS: Mean values ± standard deviation for relative handgrip strength (0.91 ± 0.21), waist circumference (96.5 ± 11.5 cm), systolic blood pressure (125.2 ± 12.5 mmHg), triglycerides (122.7 ± 85.96 mg/dL), high-density lipoprotein cholesterol (45 ± 12.2 mg/dL), and fasting glucose were (86.7 ± 11 mg/dL). Relative handgrip strength showed a significant negative association with waist circumference (β = -0.33, p = 0.036, adjusted R^2 = 0.14), independent of age. No other significant associations were observed (Ps >0.05). CONCLUSIONS: Unlike findings from the general population, higher relative handgrip strength was not strongly associated with superior metabolic health in the current sample of male firefighters. This suggests that being relatively strong may be an insufficient target for supporting metabolic health in firemen.

P340: DOES CONCERN WITH FALLING INFLUENCE NEUROCOGNITIVE PERFORMANCE AMONG OLDER ADULTS WITH AND WITHOUT PARKINSON'S DISEASE

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Background: The neurocognitive functioning of older adults is critical for overall health and well-being, particularly as it relates to the risk of falls. This study investigates the hypothesis that concern about falling may adversely affect neurocognitive performance in older adults with and without Parkinson's disease. The relationship between fall-related anxiety and neurocognitive performance in this population necessitates further exploration, as it could uncover important insights into the ways these factors affect one another. **Methods:** An older adult sample, including those diagnosed with and without Parkinson's Disease, will be recruited. The Falls Efficacy-Scale-International, FES-I, will assess falling concerns. The FES-I is a 16-item questionnaire evaluating an individual's confidence in performing daily tasks without falling. Each item is rated on a 4-point Likert scale ranging from "Not at all concerned to Very concerned." Neurocognitive performance is evaluated using the Stroop test administered through the Trazer system. A 30-second Stroop test will be completed. The subject must read the word flashed on the screen and move towards the corresponding target. The word and the color of the word may not match. This study will begin with correlation analyses to explore the relationship among the different study variables. Individual sample t-tests will assess performance differences between Parkinson's and non-Parkinson's groups. Regression analysis will be used to predict the link between fall-related concerns, as measured by the FES-I, and neurocognitive performance, assessed through the Stroop test. **Anticipated Results:** We hypothesize that those with lower FES-I scores will outperform those with high scores on the Stroop test utilizing the Trazer system. This expectation is based on the premise that individuals with lower fall efficacy may show heightened levels of cognitive engagement when faced with challenging tasks, such as the Stroop test.

P341: CAN SELF-REPORTED MEASURES PREDICT THE FUNCTIONAL FITNESS OF SENIORS WITH AND WITHOUT PARKINSON'S DISEASE?

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Background: Functional fitness within older adults is essential for engaging in daily activities independently. The deterioration of balance, strength and flexibility are common among most senior adults, preventing a healthier quality of life. Parkinson's Disease (PD) significantly impairs the ability to manage daily activities as it is a neurological disorder that impacts motor skills. Symptoms, such as, tremors, muscle stiffness and impaired balance cause a decline in functional fitness and quality of life. This study aims to identify whether self-reported questionnaires such as the PDQ-39 can predict the functional fitness, as assessed by the Senior Fitness Test (SFT), of adult seniors with and without Parkinson's disease. **Methods:** This study will recruit participants with PD and without PD (NDP), ranging from sixty-two to ninety-two years old, who are community dwelling and physically active. The PD group will complete the Parkinson's Disease Questionnaire-39 (PDQ-39), whereas an alternative form will be use for the NPD group. PDQ-39 assesses daily living from 8 dimensions: mobility, activities of daily living, emotional well-being, stigma, social support, cognition, communication, and bodily discomfort. Functional fitness will be measured utilizing the Senior Fitness Test. The six categories of the SFT are: strength, flexibility, cardiovascular endurance, balance and agility. Study variables will be analyzed for significant correlations. Group differences (PD vs. NPD) on study variables will be evaluated with ANOVA. Multiple linear regression models will examine the relationships between the 8 dimensions of the PDQ-39 and the dependent measures of SFT. **Expected Outcomes:** We anticipate that those with a higher PDQ-39 score will exhibit lower functional fitness scores on the SFT. Even though the PDQ-39 primarily measures quality of life, the dimensions of mobility, emotional well-being, and bodily discomfort could influence fitness test performance.

P342: EXPLORING THE RELATIONSHIP BETWEEN BMI, AGE, AND HBA1C IN ACTIVE OLDER AFRICAN AMERICAN WOMEN

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BACKGROUND: Glycosylated hemoglobin (HbA1c) is an assessment of glucose stability over time with a value less than 5.7 m/mol% considered normal and a value greater than 6.5m/mol% considered diabetic. Effective diabetes management requires a comprehensive understanding of the risk factors affecting older African American (AA) women. The study's purpose was to examine the relationship between HbA1c, age, and BMI in older AA women. METHODS: Participants were (N=73) older AA women who participated in health risk assessments at senior recreational centers in Charlotte, NC. The women were members of active physical activity programs at these centers with weekly involvement. They were measured for blood glucose, HbA1c, and BMI. A blood sample was collected in a small blood collector after a lancet pricked the participant's finger. It was then lightly shaken with a premixed solution and placed into the A1CNow + Professional Multi-Test HbA1c System. The Omron HBF-306C Handheld Body Fat Loss Monitor was used to calculate BMI. Participants held the monitor with both hands after the appropriate demographics were input into the machine. RESULTS: The participants ranged from 60 to 91 years with a mean age of 74.9 ± 8.2 years and were obese with a BMI of 30.2 ± 5.8 (kg/m2). HbA1c values averaged 5.8 ± .84. There was no significant relationship between age and weight (r= -.16) or between age and HbA1c (r= -.07). A significant positive relationship (r=.21) was observed for HbA1c and BMI. CONCLUSION: In active older obese AA women, no relationships were observed between age and HbA1c. However, there was a positive correlation between HbA1c and BMI suggesting that adiposity contributes to predicting diabetes in older obese active AA women.

P343: A CASE STUDY - THE HYPERBOLIC SUIT'S EFFECTS ON CLIENT WITH MUSCULAR DYSTROPHY

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Background: The Hyperbolic Super Suit (HSS) is a newly developed performance and/or clinical intervention tool that increases neuromuscular facilitation, muscle fiber recruitment, and cognitive function. Its unique combination of modalities, in several case study and research settings, appears to be having a positive impact on clients. Clinical Case: The purpose of this case study is to describe initial improvements HSS had upon a 34-year-old male diagnosed with muscle dystrophy over a decade ago. Since the diagnosis, the subject has worked with physical therapy professionals (PT) but has not experienced any significant benefits from sessions. He struggles with activities of daily life (ADL), specifically utilizing stairs, getting in and out of chairs, and bending over. The subject recently began treatment at a clinic testing HSS. An intervention plan utilizing the HSS and exercises that mimicked several ADLs was implemented twice a week during their PT sessions for a maximum of ten minutes out of their sixty-minute session. Within three weeks of use, the subjects stated they experienced a significant confidence boost and noted that their ADLs have become significantly easier. Those working with the subject indicated that their overall strength had improved, their walking gait began to normalize, shoulder blade protrusion had lessened, and the subject gained the ability to get in and out of chairs with minimal external assistance. The subject's joint angle measurements were also taken within their first full week using the suit and then again in week three; within that period, the subject gained passive range of motion in most of the sites measured. Final data collections and assessments will be completed in fall 2024 and included in final case study poster. Conclusion: Initial case studies and research suggest the Hyperbolic Super Suit can correct muscular imbalances, increase joint range of motion, muscular strength, and subject's confidence during movement at a rate that was not possible prior to use.

P344: PHYSICAL AND MENTAL WELL-BEING IN FORMER COLLEGIATE SOCCER ATHLETES

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INTRODUCTION: Collegiate soccer may carry a high risk of injury during one's career. While the long-term health outcomes of injuries in professional athletes have been well-documented, less is known about the short- to mid-term health and physical activity levels of former collegiate soccer players. This study aimed to evaluate the activity levels and physical and mental well-being of these athletes, with a secondary focus on the impact injury status has on these outcomes.METHODS: We conducted a retrospective survey-based study involving former male and female collegiate soccer athletes who competed between 2011 and 2021. Participants completed a general survey assessing demographics, injury history, current physical activity levels using the Tegner Activity Scale (TAS), and self-reported health outcomes using the PROMIS scale. A follow-up survey was administered to participants who reported injuries, focusing on joint-specific outcomes.RESULTS: Thirty-nine participants completed the initial survey, with 86 injuries reported. Among reported injuries were foot/ankle (22), knee (20), hip (12), back (6), upper extremity (5), and other (21). The average quantitative physical activity and TAS scores were 5.08 and 4.84, respectively. Average raw mental and physical PROMIS scores were 15.5±1.7 and 15.6±1.7, respectively. SANE scores averaged 76.7 in the affected limb and 89.1 in the unaffected limb. Physical PROMIS scores showed a positive correlation with affected and unaffected limb SANE scores ($p=0.02$, $p= 0.04$), and affected limb SANE scores showed a positive correlation with physical activity quantity ($p=0.04$). Of the injury-specific outcomes, the only significant correlation with activity levels was the Lysholm score with TAS score ($p=0.03$). CONCLUSION: While physical activity decreases in former collegiate soccer players, their overall mental and physical health remains stable. Future research should focus on larger cohorts to further explore the impact of specific injuries on long-term health outcomes in this population.

P345: INTENSITY DEPENDENT EFFECTS OF UNILATERAL, FATIGUING, ISOMETRIC MUSCLE CONTRACTIONS ON IPSILATERAL AND CONTRALATERAL MUSCULAR PERFORMANCE

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BACKGROUND: Time to task failure (TTF) and performance fatigability (PF; decrease in maximal voluntary force from pre- to post-fatiguing task) reflect global aspects of fatigue. For unilateral exercise, there may also be a cross-over effect, which reflects a decrease or increase in maximal voluntary force on a contralateral, non-exercised limb following a fatiguing task on a unilateral, exercised limb). The presence of any cross-over effects may be related to an intensity of muscle contraction. This study examined TTF and PF (i.e. percent change in maximal voluntary isometric contraction [MVIC] force) as well as the cross-over effects following a unilateral handgrip hold to failure (HTF) at 40% and 60% MVIC. **METHODS:** Ten females completed a pre-MVIC on both hands, sustained HTFs at randomly ordered percentages of 40% and 60% MVIC on the dominant hand, and a post-MVIC on both hands. Analyses included a paired samples t-test for comparisons of the TTF and PF, and repeated measures ANOVA for comparisons of the MVIC forces across time and between the intensities. **RESULTS:** The TTF ($p<0.001$) and PF ($p=0.002$) were significantly greater for the 40% MVIC HTF (TTF:192.9±51.8s; PF: -50.7±5.7%) compared to 60% MVIC HTF (TTF:81.2±27.2s; PF: -39.2±9.4%). Following the 60% MVIC HTF, post-MVIC (274.2±35.2N) was significantly greater than pre-MVIC (249.5±47.9N) for the non-exercised hand ($p=0.021$), but not for the 40% MVIC HTF (post-MVIC:263.0±54.6N; pre-MVIC:259.9±43.7N; $p=0.796$). **CONCLUSIONS:** The longer sustained time for accumulation of metabolites during the 40% MVIC HTF may have influenced the greater PF compared to the 60% MVIC HTF. The significant increase in MVIC force on the contralateral, unexercised hand (cross-facilitation) following the unilateral handgrip HTF at 60% MVIC, but not 40% MVIC, may be attributed to the sum of central (i.e. excitation of cortex motor areas via interhemispheric communication) and peripheral (i.e. post-activation potentiation) effects. These intensity dependent effects may inform a possible mechanism underlying the cross-education effect of unilateral, fatiguing isometric muscle contractions, which may be beneficial for training and rehabilitation settings.

P346: SEX DIFFERENCES IN VELOCITY METRICS ACROSS VARIOUS REPETITIONS IN RESERVE DURING THE BARBELL BENCH PRESS

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Background: Repetitions in reserve (RIR) and velocity-based training (VBT) are popularly used to autoregulate intensity for exercise programming. Currently, velocity drop offs of 20-40% are commonly found throughout the literature, but it remains unclear how such velocity drop offs relate to RIR. Due to previously established sex differences in relative barbell velocity, the purpose of this study was to evaluate the relationship between sex and relative average concentric velocity (ACV) drop off at 0-3 RIR during a barbell bench press workout. **Methods**: Barbell bench press 1RM was assessed in 24 resistance trained (6.0±3.9yrs) males (n=12; 24.1±6.1yrs) and females (n=12; 22.5±5.5yrs) followed by a single set to volitional fatigue using 80% of the established 1RM (RTF). A linear transducer assessed ACV for each repetition throughout RTF. Percent velocity drop-off (%DO) was calculated for failure (0RIR), 1 RIR (1RIR), 2 RIR (2RIR), and 3 RIR (3RIR) using the following formula ((X repetition ACV - 1st Repetition ACV)/1st Repetition ACV). A Sex × RIR%DO repeated measures ANOVA was used to determine if sex differences were apparent. Significance was accepted at $p\leq.05$. **Results**: A main effect of RIR%DO was noted ($p<.001$). However, no Sex × RIR%DO interactions ($p=.484$) or main effects of sex ($p=.312$) were seen. All proximities to failure were significantly different from one other (3RIR: -14.7±18.2%, 2RIR: -26±16.3%, 1RIR: -38.2±20.8%, 0RIR: -54.1±13.3%; $ps<.008$). However, this was not found to be impacted by sex. **Conclusions:** Our data suggests that velocity decreases significantly the closer to failure a repetition is performed regardless of sex. These results leave us to conclude that at a moderate load, in a laboratory setting, there are no appreciable differences in barbell velocity at 0-3 RIR between sexes. Thus, if VBT is being used in an attempt to objectively autoregulate training, %DO does not need to be adjusted due to sex.

P347: EFFECTS OF TRAVEL STRESS AND TRAINING LOAD ON NCAA DI WOMEN'S BASKETBALL PERFORMANCE

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Background: Recent NCAA DI conference realignment will require many NCAA DI student-athletes to travel greater distances for competitions on a more frequent basis than ever before. Therefore, this study aimed to measure the effects of in-season travel stress and sport-specific training load on specific measures of in-game basketball performance in a sample of NCAA DI Women's Basketball athletes. **Methods:** An NCAA DI Women's Basketball team (n = 13) was assessed via measures of in-game basketball performance over the course of one competitive season. Travel stress (TS) was assessed at both the acute (ATS) and chronic (CTS) level for each game (n = 30) of the season and sport-specific training load (TL) was measured using sport-specific GPS monitors (Catapult, Melbourne, Australia). Associations between TS and TL with in-game performance were measured using correlations adjusted for opponent quality. Linear regression was used to assess potential interaction effects of TS and ETL on in-game performance and an alpha-level of $p < .05$ was used to determine statistical significance. **Results:** Significant negative correlations were observed between time zone change and team performance efficiency rating (PER; $r = -.505$; $p < 0.01$) and end-game scoring margin (EGSM; $r = -.596$; $p < 0.01$). TL demonstrated a significant, negative association on team free throw percentage (FT%; $r = -.410$; $p < 0.05$), particularly TL accumulated on the day prior to a competition. No significant interaction effects between TS and TL were observed. **Conclusions**: Results of the study demonstrate small to moderate negative associations of both travel stress and sport-specific training load on in-game basketball performance. In light of recent NCAA DI conference realignment, further research on the topic is warranted to better elucidate the potential for TS to negatively impact sport performance in this population.

P348: EVALUATING FAT-FREE MASS INDEX AND LEAN MASS INDEX IN NCAA DIVISION I FEMALE ATHLETES

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BACKGROUND: Lean mass (LM) is directly related to athletic performance and injury prevention. Fat-free mass index (FFMI), which serves as a height-relative measure of LM and bone mineral content (BMC), may be an early indicator of low energy availability and injury risk. The purpose of this analysis was to examine the relationship between FFMI and LMI in elite female athletes and to characterize between sport differences. **METHODS:** Data were analyzed for 60 female NCAA DI collegiate athletes (mean±SD; age: 20.5±1.5 yrs, LM: 49.1±6.4 kg, BMC: 2.4±0.3 kg) across four teams—field hockey (FH), gymnastics (GYM), lacrosse (LAX), and soccer (SOC). Body composition was measured using whole-body dual-energy x-ray absorptiometry to evaluate LM (kg) and BMC (kg). FFMI (kg/m^2) was calculated as the sum of total LM (kg) and BMC (kg), divided by height (m^2), and LMI as total LM (kg) divided by height (m^2). A Pearson's correlation was calculated to assess the relationship between FFMI and LMI. A one-way analysis of variance was applied to compare FFMI and LMI between sports. **RESULTS:** A strong, positive correlation was found between FFMI and LMI ($r=0.995$, $p<0.001$) across the sample. Neither FFMI (17.77±1.45 kg/m^2, $p=0.087$) nor LMI (17.78±1.49 kg/m^2, $p=0.108$) were significantly different between sports. However, LAX had the highest FFMI (18.2±1.3 kg/m^2) that trended towards significance when compared to GYM (16.6±1.2 kg/m^2, $p=0.059$), with a smaller difference found in LMI (mean difference ± standard error [LAX - GYM]: 1.5±0.6 kg/m^2, $p=0.071$). **CONCLUSION:** There is a strong, positive relationship between FFMI and LMI—suggesting that FFMI and LMI are highly interchangeable. However, greater sensitivity may exist in FFMI which is reflected in the greater difference observed between LAX and GYM, as compared to LMI. Leveraging FFMI cut points established for female athletes may provide a tool for guiding nutrition, training, and injury prevention.

P349: CHANGES IN COUNTERMOVEMENT JUMP PERFORMANCE IN COLLEGIATE DISTANCE RUNNERS PRE AND POST-TEMPO RUN

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BACKGROUND: Running is the most popular form of physical activity worldwide, and it has a positive effect on overall health. However, competitive running is also associated with stress injuries and overtraining. Countermovement jumps (CMJ) have previously been used to monitor training load and neuromuscular fatigue in athletes across multiple sports. However, there are discrepancies when utilizing CMJ in an acute setting, immediately following a workout. Therefore, the purpose of this study is to assess countermovement jump (CMJ) performance and neuromuscular fatigue in collegiate distance runners following a hard workout. **METHODS:** In total, 12 female and 15 male distance runners from the Ole Miss cross country team performed CMJ tests before and after a tempo run workout. The athletes completed a standardized warm-up followed by 2 CMJs and 2 single-leg CMJs on each leg using the VALD ForceDecks platform. The males' distances ranged from 8 to 14 miles, and the females' ranged from 8 to 10 miles. Following their run, they rested for 2 minutes and performed the same jump sequence again. Peak power, jump height, RSI, and vertical velocity measurements were recorded. The athletes reported their Perceived Recovery Status and Rating-of-Fatigue scales pre- and post-run. A paired t-test was utilized to examine pre- and post-run data, and Pearson correlation was used to examine the correlation between perceived measures and jump performance. **RESULTS:** Decreases were found in perceived recovery, and increases were observed in the rate of fatigue post-run compared to pre-run ($p < 0.05$). No significant differences were found for pre- and post-CMJ performance, but there was a trend of improved CMJ performance. Significant increases were observed for single-leg CMJ for both the right and left leg in peak power ($p < 0.001$) and jump height ($p < 0.001$) post-run. Additionally, no significant correlations were found between perceived fatigue and CMJ performance, with the alpha set at 0.05. **CONCLUSION:** The results indicate that CMJ or single-leg CMJs may not be valid tools for measuring acute neuromuscular fatigue in cross-country athletes. The results may potentially be indicative of the post-activation performance enhancement (PAPE) phenomenon. Further studies need to be conducted, collecting more data to explore this idea.

P350: THE INFLUENCE OF SELF-REPORTED SUBJECT EFFORT ON MEASUREMENT VARIABILITY IN LOW-STAKES TESTS OF ENDURANCE PERFORMANCE

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Purpose: This study examined the effects of self-reported effort ratings on time trial performance variability in cyclists. Methods: Seven cyclists completed a preliminary trial and 3 identical exercise trials. Exercise trials consisted of 15 min of constant-load cycling (5 min at 50% Wmax, 10 min at 70% Wmax), followed immediately by a 20-km self-paced time trial (TT). Immediately following the TT, participants completed two self-reported measures of expended effort [i.e. Student Opinion Subscale (SOS) and Effort Thermometer scale] to ascertain their perceived effort during the TT. Subjects also completed a Conscientiousness questionnaire during their preliminary trial and a Rating of Effort Given by Others (other participants in TTs) questionnaire following their final exercise trial. For statistical analyses, subjects were divided into either a high effort group (HEG) or low effort group (LEG) based on their effort ratings during the TT. Between-trial variability (CV) was calculated between TT 1-2 and 2-3 for both groups. Independent t-tests were used to assess potential differences in TT performance variability between HEG and LEG groups, with an alpha-level for statistical significance at $p < 0.05$. Results: No differences in TT performance were observed between trials 1, 2 and 3 (38.3 ± 4.0 min; 37.6 ± 2.4 min; 37.6 ± 3.0 min, respectively; $p > 0.05$). CV in TT time tended to be lower between trials 2-3 (2.1 ± 1.6%) versus trials 1-2 (3.3 ± 1.5%), though the difference was not statistically significant ($p > 0.05$). Individual effort ratings on both the Effort Thermometer (9.0 ± 0.9; 1-10 point scale) and the SOS (22 ± 2.4; 5-25 point scale) were generally high across all subjects and trials. There was no systematic evidence that those who reported higher effort (or more consistent effort between trials) had a lower CV in performance between trials. Similarly, scores from

the Conscientiousness questionnaire and the Rating of Effort Given by Others questionnaire were not associated with TT performance variability. Conclusion: Self-reported effort ratings were not associated with between-trial variability in TT performance. This may be due to the generally high (and consistent) ratings of effort reported by those who volunteer for laboratory-based exercise studies.

P351: "DO HEALTHY PEOPLE PASS ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION RETURN TO SPORT TESTING? A SYSTEMATIC REVIEW"

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BACKGROUND: Return to sport (RTS) is a common goal after anterior cruciate ligament reconstruction (ACLR) but carries a relatively high risk of re-injury with up to 20-25% of athletes experiencing graft rupture or contralateral ACL tear. While there is increased emphasis on establishing safe RTS criteria for athletes to return to prior activity levels, studies show that even healthy individuals have difficulty passing RTS testing. PURPOSE: This systematic review aims to synthesize data concerning whether healthy individuals can pass ACLR RTS rehabilitation tests. METHODS: Following the established Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines, a systematic literature search was conducted in May 2023. Three databases were used in the search (PubMed, EMBASE, SPORTDiscus) to retrieve all studies that conducted ACLR RTS rehabilitation tests on healthy individuals. Tests included were isometric strength, isokinetic strength, hop tests, and balance tests. The search was performed in duplicate, and a quality assessment of all studies was included. RESULTS: A total of 1724 studies were retrieved, of which 32 were included, involving 1552 controls with no history of ACL injury. From the studies analyzed, 5.3% to 42.2% of participants failed 6 different hop tests, 15.2% of participants failed the star excursion balance test, 37% of participants failed the isometric knee flexion test, 50% of participants failed the isometric knee extension test, and 23.7% to 28.9% of participants failed the drop vertical jump test. An asymmetry index greater than or equal to 10% was found in 6 of the 18 isokinetic tests and 2 of the 14 isometric tests. Hop testing was the most common test in the included studies (56.3%) followed by balance testing (31.3%), isometric strength testing (31.3%), isokinetic strength testing (25%), and drop vertical jump (6.3%). CONCLUSION: A substantial percentage of healthy participants fail ACLR RTS rehabilitation tests. Healthy individuals have natural variation from side to side that can be greater than 10% for any individual test. When setting thresholds for passing RTS testing, clinicians should set a practical value that helps reduce reinjury rates.

P352: PRE-SEASON COUNTERMOVEMENT JUMP DERIVED NEUROMUSCULAR PERFORMANCE IN FEMALE NCAA DIVISION III VOLLEYBALL PLAYERS

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BACKGROUND: Over the years, several studies have examined the physiological profile of elite male and female volleyball players. However, normative countermovement jump (CMJ) and neuromuscular performance data for NCAA Division III female volleyball players are limited. Therefore, this study aimed to examine CMJ derived variables in this population and compare them to studies that utilized volleyball players or other NCAA Division III female athletes. METHODS: Seventeen members of a NCAA Division III women's volleyball team (mean ± SD): age (19 ± 1.0 yrs); body weight (70.82 ± 13.07 kg); height (1.70 ± 7.97 m); BMI (24.46 ± 4.64 kg·m^{-2}) volunteered to participate in the study. CMJ neuromuscular performance testing included jump height, Reactive Strength Index Modified (RSIm), movement time, peak relative eccentric and concentric force and peak relative eccentric and concentric power. All performance testing occurred before the start of the regular season. RESULTS: The current study yielded the following results (27.71 ± 5.13 cm), RSIm (0.33 ± 0.10), peak relative eccentric force (22.25 ± 2.76 N·kg^{-1}), peak relative concentric force (22.28 ± 2.66 N·kg^{-1}), peak relative eccentric power (15.56 ± 4.20 W·kg^{-1}) and peak relative concentric power (43.73 ± 6.18 W·kg^{-1}). CONCLUSIONS: This study provides normative data for a selected group of NCAA Division III female volleyball players. In comparison to other populations utilizing volleyball players or other NCAA Division III female athletes, the athletic ability of the athletes observed in this study appears to be comparable to or better than other female athletes.

P353: EFFECTS OF ALTITUDE ON ANAEROBIC POWER AND RECOVERY VARIABLES USING AN ATHLETIC COLLEGE POPULATION

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BACKGROUND: Altitude is known to have both negative acute and positive chronic adaptations on endurance athletes. Regarding anaerobic performance, there appear to be very few research studies that have evaluated the impact of altitude on single-bout, explosive, anaerobic activity. Therefore, the purpose of this study is to analyze the impact that altitude may have on power output, RPE, fatigue index, and recovery in an athletic collegiate population who are engaging in several high-intensity interval training (HIIT) sessions. METHODS: Fourteen highly fit, college-aged subjects were recruited for this study. Subjects had their body fat percentage assessed using an Inbody 770 Body Composition Analyzer and then completed a warmup protocol of 5 minutes of leg ergometry at an established workload of 60% of their maximal HR. Then, in a counterbalanced order, each subject underwent 5 trials of 15 seconds of intense leg ergometry, followed by 45 seconds of recovery, either at sea level or at a simulated altitude of 6000 feet. Ratings of perceived exertion (RPE) were recorded after each interval, and twenty minutes post-session (ie. session RPE). Subjects returned 24-48 hours later and repeated the prior session's warmup and interval protocols. The perceived recovery status scale (PRSS) was implemented before every trial. A Paired Samples T-Test was used to analyze maximal power output, fatigue index, and perceived exertion with an alpha level of 0.05 being utilized. SPSS Statistical Analysis program was used in order to analyze the main variables of interest. RESULTS: No significant difference in max power output (p=.293), fatigue index (p=0.233), or rating of perceived exertion (p=0.096) between the experimental and control groups. True to previous assumptions, there was also no significant difference in perceived recovery between the two groups (p=0.333). CONCLUSIONS: The results of this study show that there is no significant difference in repeated anaerobic performance in conditions of acute altitude exposure vs sea level. Future research should assess the use of a more specialized population, and their exposure to chronic anaerobic bouts at altitude, across a longer period of time, in order to determine its impact on subsequent performance.

P354: ASSESSING THE OPTIMAL AMOUNT OF BROAD JUMP TRIALS NECESSARY FOR ACHIEVING PEAK PERFORMANCE

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Muscular power is a physical attribute associated with performances in team sports like soccer, lacrosse, basketball, and field hockey which involves several bursts of explosive sprints. The standing broad jump test (SBJ) is a non-invasive, time efficient, and cost-effective test used in assessing lower-body muscular power. Prior studies have investigated the reliability and validity of SBJ and the impact of lower body resistance training on SBJ. However, there appears to be no study that has evaluated the total number of jumps required to elicit peak jumping performance. Thus, the purpose of this study is to examine the optimal number of broad jumps necessary to achieve peak jumping performance using highly fit recreational athletes. METHODS: Twenty-five to forty recreationally fit collegiate students will be recruited for this study. Anthropometric data (i.e. height, weight, and body fat percentage) will be collected. Subjects will first complete 10 minutes of dynamic warm-up protocol and then each subject will be given 3 familiarization jumps with 30s rest between each jump. After completion of familiarization jumps, subjects will jump numerous times to achieve their longest jump. When subjects have had 3 consecutive attempts that do not surpass their previous furthest jump, the testing session will be over. Ratings of perceived exertion (RPE) will be assessed after every jump. Descriptive statistics will be calculated for anthropometric data, while means and standard deviations will be assessed for jump distance, number of attempts, and RPE. ANTICIPATED RESULTS: Usually, 2-3 jumps are the maximum number athletes and military personnel complete when assessing SBJ, yet we foresee that some participants will record their longest jump after 2-3 attempts. Body fat percentage may also play a factor in jumping performance.

P355: COMPARISONS OFCOUNTERMOVEMENT JUMP PERFORMANCEACROSS THE SEASONIN DIVISIONICOLLEGIATE BASEBALLPLAYERS

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BACKGROUND: The countermovement jump (CMJ) is regularly used in strength and conditioning settings to monitor changes in performance. This may provide information to coaches regarding training-related adaptations and/or decrements in performance. The purpose of this study was to examine changes in jump height (JH), peak power (PP), and reactive strength index (RSI) across the regular season in Division I collegiate baseball players.METHODS: Forty-five Division I collegiate baseball players completed weekly CMJs throughout the season. The CMJs were completed on force plates at the beginning of each week. Each athlete performed a rapid countermovement of self-selected depth followed by a maximal vertical jump with their hands on their hips throughout the entire movement. Each athlete performed three attempts of the CMJ. Jump height, PP, and RSI were taken from the attempt with the highest JH. Data were assessed across 13 weeks of the season. Repeated-measures analyses of variance examined changes in JH, PP, and RSI across the season.RESULTS: For JH, week 4 was greater than week 5, 11, and 12 ($p \leq 0.033$). For PP, week 4 was greater than week 11 and 12 ($p \leq 0.049$), week 7 was greater than week 5, 11, and 12 ($p \leq 0.034$), and week 10 was greater than week 11 ($p = 0.041$). For RSI, week 1 was greater than week 5 and 12 ($p \leq 0.020$), week 2 was greater than week 5 ($p = 0.049$), week 6 was greater than week 5 and 12 ($p \leq 0.013$), and week 7 was greater than week 5 and weeks 9-13 ($p \leq 0.033$).CONCLUSIONS: The present results suggest that changes in PP and RSI may be more sensitive to changes across the season than JH, indicating the importance of variable selection when using the CMJ to monitor improvements and/or decrements in performance. It also appears that week 5 of the season, as well as the final weeks of the season, have lower performance than the rest of the season. In conclusion, the combination of multiple performance metrics of the CMJ may provide holistic examination regarding changes in athletic performance across the season in collegiate baseball players, providing strength and conditioning coaches and practitioners objective data by which they may modify training programs based on weekly changes in these variables.

P356: IMPACT OF PREVIOUS INJURY AND PAIN ON LUMBOPELVIC-HIP COMPLEX FUNCTION AMONG COLLEGE ATHLETES

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Clinicians use the lower quartile Y-Balance test (YBT-LQ) to help determine if a load compromised athlete can withstand additional stress in order to decide their capability of returning to play. Also, the YBT-LQ has been found to predict lower-limb injury risk. Multiple studies reveal that the YBT-LQ is affected greatly by hip rotational range of motion. Adding electromyography (EMG) to assess lumbopelvic-hip complex (LPHC) muscle activity with the YBT-LQ at the end of the range of motion, would provide additional insights into the athlete's limitations on returning to play. Therefore, the purpose is to examine the effects of injury history and pain on hip rotational range of motion, YBT-LQ performance, and LPHC muscle activation. Participants will include active collegiate athletes separated into a healthy group and injury/pain group. Participants will be selected for the injury/pain group if they experience current pain or have had a previous lower extremity injury which prevented sport participation. Hip range of motion will be measured using a digital inclinometer under the previously established sitting protocol. Six EMG sensors will be placed on the bilateral gluteus medius, rectus femoris, and erector spinae muscle group. Once hip rotational range of motion and manual muscle testing has been completed, participants will perform the YBT-LQ with three trials bilaterally each in the anterior, posterolateral, and posteromedial directions. Trials in each direction will be averaged and analyzed using a one-way MANOVA. We hypothesize that injury and/or pain in the lower extremities will be associated with limited rotational hip range of motion, increased bilateral muscle activation in the gluteus medius, rectus femoris, and erector spinae muscle group, as well as overall lower performance on the YBT-LQ.

P357: EFFECT OF TYPE OF REST INTERVAL ON CHANGE OF DIRECTION AND AGILITY

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In team sports, it is common for teams to warm up together before competition, but those athletes who do not compete within the first minutes of the competition often sit for extended periods of time before entering the game. Evidence suggests that athletic performance begins to decline after 20 minutes of seated rest, but whether these effects can be attenuated by standing or other types of physical activities is not well understood. The purpose of this study was to compare effects of seated, standing, and re-warm up rest intervals on agility, reaction time, and ear temperature in recreationally active college-age females. College-age females who self-reported participating in at least 150 min/week of moderate to vigorous intensity physical activity were recruited to participate. Participants visited the lab on three occasions, separated by at least 48 hours, and completed a standardized warm-up protocol. Participants then were assigned to sit in a chair, stand still in one place, or complete a standardized re-warm up during a 20 minute period; order of the sessions was counterbalanced. During each session, participants completed two trials of a pro-agility test involving sprinting with direction change, and two trials of a semi-circle drill where participants responded to 15 repetitions of sensors, placed in a semi-circle, as quickly as possible. There were no significant differences in reaction time during semi-circle drill (0.84±0.11 vs 0.77±0.15 vs 0.78±0.12 seconds) or pro-agility sprint time (5.36±0.61 vs 5.43±0.74 vs 5.35±0.46 seconds) for sit, stand, and re-warm up respectively, $p<0.05$. These data suggest that that neither standing nor re-warming during 20 min of rest improves agility or change of direction.

P358: COMPARISON OF COUNTERMOVEMENT JUMP PERFORMANCE IN HIGH AND LOW THROWING VELOCITY COLLEGIATE BASEBALL PITCHERS

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BACKGROUND: Countermovement jump (CMJ) testing is used in sports to test athletes' ability to generate explosive force through the lower extremities. Lower extremity force production during throwing has been shown to lead higher pitching velocity. Thus, the purpose of this study was to investigate differences in CMJ performance across high and low throwing velocity groups within Division I pitchers. METHODS: Nineteen NCAA Division I male baseball players were tested during their routine athlete monitoring program. CMJ and pitching velocity were tested in a two-day period during the beginning of the fall season. Maximal fastball velocity data was acquired during intersquad games using a Trackman system. Pitchers were then grouped into high velocity or low velocity categories based on their fastball velocity proximity to the mean velocity of the sample (90.16 mph). CMJ data was acquired using a portable force plate sampling at 1000 Hz. Participants performed three maximal effort trials. CMJ variables assessed were braking peak and mean force (N), propulsive peak and mean force (N), phase duration (ms), time to takeoff (ms), countermovement depth (m), jump height (JH) (m), and reactive strength index modified (RSImod). Indepentent samples t-test were used to compare high and low velocity groups across all variables of interest. Additionally, Cohen's d effect sizes were calculated for each variable of interest. RESULTS: No statistically significant differences were seen between groups for any variables of interest. Although not statistically significant, there were moderate effect sizes found between groups for JH (0.56 ± 0.09 vs. 0.50 ± 0.06, $p = 0.10$, $d = 0.78$). Additionally, a moderate effect size was seen in RSImod between groups (0.63 ± 0.14 vs. 0.55 ± 0.08, $p = 0.17$, $d = 0.65$). CONCLUSIONS: Although no significant differences were seen between groups, the moderate effect size within this small sample of pitcher's points to the possibility of JH being a potential variable of interest when examining the translation of physical performance profiling to on-field performance in baseball pitchers. As such, the data from this investigation supports the notion that increasing the output of the test (JH and RSImod), and not focusing on a specific jump strategy should be the goal of strength and conditioning practitioners.

P359: EFFECTS OF FACIAL OR WHOLE BODY COLD WATER IMMERSION ON AUTONOMIC FUNCTION AND STRENGTH ENDURANCE

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BACKGROUND: Effective recovery is pivotal for preventing injuries and maximizing the benefits derived from strenuous workouts. Cold water immersion may serve as a catalyst for accelerated recovery through reducing muscle damage and optimizing autonomic nervous system function. The mammalian diving reflex triggered by facial immersion in cold water has a sudden effect on the autonomic nervous system, but it is not clear if this effect would last. The purpose of this study was to evaluate the efficacy of whole body cold-water immersion versus facial cold-water immersion. **METHODS:** 11 collegiate athletes were recruited for the study. In this randomized crossover design study, 11 college aged participants underwent three trials, each separated by a week, of seven days of daily 5-minute full-body submersion in an ice bath (BODY), 15 second targeted immersion of the face in an ice bath (FACE), or no cold water immersion (CONT). At the end of each trial, participants were asked to complete bench press, deadlift, and squat to failure at a set weight and provide HRV via heart rate strap. Data was analyzed using a repeated measures ANOVA. **RESULTS:** No significant results were found for group and/or time interactions. Total reps of bench press until failure did approach significance between the BODY and CONT groups (13.1 vs 11.5, p = 0.053). **CONCLUSIONS:** Overall, the outcomes of our study ultimately proved to have no significance. With a larger testing group, some results may reach significance. No indication for the use of facial cooling and submersion to improve long term autonomic function or strength was found.

P360: ISOKINETIC MUSCLE TORQUE OF THE KNEE AT DIFFERENT VELOCITIES

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ISOKINETIC MUSCLE TORQUE OF THE KNEE AT DIFFERENT VELOCITIESFaith Johnson, Caylee Brown, Rosa Martinez, Dakota Morgan, Benjamin Jones, Jordan Bettleyon, and Amanda Ransom, Methodist University BACKGROUND: This study aimed to examine if there was a difference in the quadricep-to-hamstring (Q:H) ratio during isokinetic knee flexion and extension in the planting leg of female soccer players. METHODS: 16 volunteer female athletes aged 18-21 from Methodist University (Height: 1.62 ± 0.007 m; Body mass: 64.23 ±11.5 kg, 16 R dominant & no L dominant) participated in the study. Participants performed voluntary isokinetic quadriceps and hamstring contractions at 60°/s, 180°/s, and 300°/s, respectively, using a Biodex. The knee extension peak torque divided by the knee flexion peak torque was recorded to represent the Q:H ratio. The angle at peak torque was also recorded. A 1-way analysis of variance (ANOVA) was used to determine the differences in the Q:H ratio and the angle at peak torque among the different isokinetic velocities. RESULTS: A significant difference in the Q:H ratio was found between the isokinetic velocities (F (2,45)=3.13, p=.05). Follow-up tests found a significantly higher Q:H ratio at 300°/s (M=1.34, sd= 0.36) compared to the 60°/s (M= 1.66, sd=0.39) and the 180°/s (M=1.57, sd=0.37). A significant difference was also found in the flexion angle at peak torque between the isokinetic velocities (F (2,45)= 8.29, p=.0008). Follow-up tests revealed a significantly higher flexion angle at peak torque at 300°/s (M=78.88, sd= 33.58°.) compared to the 60°/s (M= 50.19, sd=11.35°) and the 180°/s (M=48.0, sd=21.49°). No significant difference was found in the extension angle at peak torque. CONCLUSION: Increases in joint velocity angles demonstrated increases in the hamstring eccentric strength as the Q:H ratio begins to be closer to 1.3:1 as compared to the current gold standard of 2:1 ratio seen at lower velocities. It is theorized that this increase in the ratio is due to the hamstrings acting as a dynamic stabilizer of the knee joint. If this ratio does not approach 1.3:1, it may be an indicator that predisposes athletes to injury.

P361: COMPARING DISTAL AND PROXIMAL MUSCLE THICKNESS ULTRASOUND MEASURES FOR RECTUS FEMORIS

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BACKGROUND: Ultrasound scans of the rectus femoris are commonly being used to assess muscle thickness (MT). The MT measure may be relevant to health and/or performance for research and/or clinical settings. These assessments are typically completed in the mid-section of the muscle. For repeated measures, it may be difficult to complete the scan in the same location. It is important to determine how sensitive the MT assessments are to minor measurement errors. **PURPOSE**: Determine potential variability in MT measurement by purposely altering scan location by 2cm in both proximal and distal directions relative to midpoint. It was hypothesized that the proximal and distal sites would have significantly reduced MT compared to the middle site. **METHODS:** Ten healthy adults (20-50 yrs) participated in the study. During testing, participants laid supine on an athletic training table. The first scan was taken at the midpoint of the muscle (between greater trochanter of the femur and the lateral epicondyle of the tibia). The second and third scans were taken 2cm distal and proximal. Scan were taken in B-Mode using a Logic e ultrasound (General Electric, Singapore). A 1-way ANOVA was used to test for significant differences (α;=0.05) among the middle, distal, and proximal measures. **RESULTS**: There were no significant differences (p=0.59) among the middle (2.06±0.35), distal (1.80±0.40), and proximal (2.20±0.36) sites. For 8 of 10 participants, there were minimal differences among the three sites (≤ 3mm). For two patients, there were greater differences among the three sites (5-10mm). **CONCLUSION**: The MT measure appeared to be quite consistent across the 4cm assessed. This suggests that the rectus femoris may not be overly sensitive to small measurement errors.

P362: FORCE PERCEPTION IS LESS ACCURATE AT LOWER INTENSITIES IN THE ISOMETRIC BACK SQUAT

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BACKGROUND: The purpose of this investigation was to compare the accuracy of force perception in warm-up repetitions at 25%, 50%, and 75% in the isometric back squat (SQ) and isometric knee extension (KE). **METHODS:** Twenty-six trained males (n=10) and females (n=16) completed one session where they performed the isometric back squat (SQ) on a force plate and the isometric (KE) with their dominant leg attached to a load cell. Following a brief 5-minute warm-up on a cycle ergometer, subjects completed 3 separate 3-5 second warm-up contractions at 25, 50, and 75% of their perceived maximum voluntary isometric contraction (MVIC) strength. No feedback of any kind was provided to the subjects. Peak force (PF) was averaged across the 3 repetitions at each submaximal target and normalized to PF obtained during the MVIC. The target force was then subtracted from the normalized PF (NPF_{ERROR}) to examine changes in accuracy across contraction intensities and timepoints. A one-way ANOVA was run to examine NPF_{ERROR}. Alpha was set a-priori at 0.05 and all data was analyzed in SPSS. **RESULTS:** There was no significant target force × lift × sex interaction effect (p=0.115). However, there was a significant target force × lift interaction effect (p<0.001). Post-hoc analyses indicated that when collapsed across sex, NPF_{ERROR} was significantly different across all target force levels during both KE (p<0.001) and SQ (p<0.001-0.005). NPF_{ERROR} at 25% target force was significantly greater in SQ (+24.2±20.8 %MVIC) when compared to KE (+13.8±19.8 %MVIC), but not at 50% target force (p=0.366; SQ: +6.7±19.7 %MVIC; KE: +0.7±19.5 %MVIC) or 75% target force (p=0.887; SQ: -9.4±20.9 %MVIC; KE: -11.3 ± 17.1 %MVIC). There were no other significant interaction or main effects (p=0.136-0.896). **CONCLUSIONS:** Our results suggest that sex does not influence the accuracy of force perception and that there were differences in NPF_{ERROR} between the isometric squat and the isometric knee extension. Additionally, error in force perception was significantly greater at lower intensities (25%) in the squat compared to knee extension. These differences in force perception between exercises were not significantly different between exercises at higher intensities (50% and 75%).

P401: FIREFIGHTER FMS SCORES AND PHYSICAL ABILITY TEST SCORES AS MEASURES OF PREDICTING OCCUPATIONAL EFFICIENCY

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BACKGROUND: Firefighting is an occupation which requires a conditioned physical state. To evaluate physical readiness, firefighters must pass Firefighter Physical Ability Tests (FPATs), which consist of various simulated firefighting tasks. Those who score higher are

thought to be better equipped for the occupation. The Functional Movement Screen (FMS) examines movement patterns that challenge mobility and stability by placing the body in positions where movement deficits become evident. A full FMS screen consists of seven screens: deep squat, inline lunge, hurdle step, shoulder mobility, trunk stability, rotary stability, and active straight leg raise. The proposed study will examine the relationship between FMS scores and FPAT scores as an indicator of occupational efficiency. METHODS: We plan to recruit 50 full-time firefighters over the age of 18 to participate in this study. Typical firefighting shifts consist of eight personnel on duty per shift and therefore a target sample size of 50 would allow for sampling multiple different shifts as well as contribute to a greater diversity among participants. Additionally, similar studies exploring the relationship between physical fitness and firefighter ability utilized sample sizes ranging from 20-89, making 50 a reasonable approximate sample size. Each participant will complete two full FMS screens, once in athletic clothing and again in full turnout gear. Following FMS screening, preexisting FPAT scores will be obtained from each department and later analyzed to determine if individuals who scored poorly on the FMS screens also produced lower FPAT scores. Results will be analyzed using a standard t-test to examine the relationship between FMS scores in and out of turnout gear and their relationship with FPAT scores. ANTICIPATED RESULTS: We hypothesize that the additional load caused by turnout-gear will result in a change in weight distribution, which may require participants to assume compensatory movement patterns, thus impacting their FMS scores. We further hypothesize that if an individual exhibits movement dysfunction that forces them to utilize compensatory movement patterns, they will move less efficiently. This may be further explored through the analysis of FPAT scores, which can be used as a predictor of occupational efficiency.

P402: COMPARING WHOLE BODY SWEAT RATE ESTIMATES BETWEEN COMMERICAL SWEAT PATCH AND BODY MASS CHANGE METHODS

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COMPARING WHOLE BODY SWEAT RATE ESTIMATES BETWEEN COMMERICAL SWEAT PATCH AND BODY MASS CHANGE METHODS Laura D. Jones, Peyton S. Higgins, Marissa L. Bello, Emily L. Langford, Stacy H. Bishop, Greg A. Ryan, Robert L. Herron University of Montevallo, University of Arkansas Monticello, Middle Tennessee State University, Georgia Southern University **BACKGROUND:** Hydration status impacts performance and safety during physical activity in the heat. However, sweat rate testing - to inform practice and mitigate the risks of hypohydration - is not common outside of high-performance or research settings. The purpose of this study was to compare sweat rate estimates during exercise in the heat between a commercially-available, sweat testing patch (PATCH) and a corrected, body mass loss estimate (SwR) - common in research. **METHODS:** Participants (n = 8; female = 4; aged 24 ± 3 y) completed exercise in an environmental chamber (35.9 ± 1.9 ^{0}C; 34.9 ± 3.1% RH) in fasted, euhydrated state (USG ≤ 1.020). The participants completed 20 minutes of walking at ≈ 6 METs (69.68 m·min^{-1} and 8.5% grade) followed by 10 minutes of seated recovery. Sweat rate was estimated two ways. PATCH required participants to wear a patch on their forearm and a photo of the patch was uploaded to a smart-phone application post-exercise. PATCH reported a sweat rate range from which an average was calculated. Second, SwR used participants' post-exercise body mass subtracted from their pre-exercise body mass, adjusted for fluid consumed during exercise. The difference in mass was recorded to the nearest 0.1 kg. Both methods required transforming data to L · h^{-1} to compare sweat rates. A paired-samples, *t*-Test ($p \leq 0.05$) was used to investigate differences between SwR and PATCH; and Pearson's correlation was used to explore their relationship. **RESULTS:** SwR (0.6 ± 0.3 L · h^{-1}) was lower than the PATCH (1.2 ± 0.3 L · h^{-1}; $p < 0.001$) but highly correlated (r = 0.76). Of note, SWR was less than PATCH for all observations (range = 28-78% lower). **CONCLUSIONS:** Sweat testing is logistically difficult. The benefits that can be gleaned from commercially-available, wearable technology is promising. However, within this design, a sweat patch overestimated sweat rate when compared to methods that use body-mass change during this short exercise session in the heat.

P403: THE EFFECTS OF FOCUS OF ATTENTION ON FORCE, FATIGUE AND PERFORMANCE DURING A MOTOR TASK

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BACKGROUD: Focus of Attention (FoA) and performance is a theory that determines how performers use their attention to reach maximum performance. Performers can either adopt an internal or external FoA while performing a motor task. Internal focus is adopted when performers think about their own bodies while performing a skill (e.g. thinking about my arm extension while throwing a ball), and external focus is adopted when a performer thinks about the goal of the skill (e.g. looking at the rim while performing a jump shot on basketball). Previous research on FoA found that external focus led to superior performance in dynamic and isometric tasks, and in different skills. In addition, previous research utilizing electromyography, found that less motor units were recruited and more force was generated when an external focus was adopted. Therefore, the purpose of this study is to examine how FoA impacts performance, force production, tissue oxygenation, and fatigue on a wall-sit task. METHODS: we plan to recruit 60 male and female participants between the ages of 18 and 30 to complete this study. Each participant will come to the lab one day and complete two wall-sit tasks while adopting an internal or external Foci of attention in counterbalanced order. We will examine time to failure; force production (EMG) of the Vastus Lateralis of the Dominant leg, tissue oxygenation (near-infrared spectroscopy) of the non-dominant leg, and fatigue (EMG and RPE) for both conditions. Results will be analyzed using Multiple Factorial-ANOVAs to determine the significance of differences between Foci of attention condition in performance, force production, tissue oxygenation, and fatigue. ANTICIPATED RESULTS: We predict that (1) external FoA will enable participants to stay for a longer time on task; (2) external FoA will make participants perceive the task as less demanding (RPE and EMG); and (3) External FoA will recruit less motor units while being more efficient (EMG).

P404: THE IMPACT OF ASSESSMENT METHOD ON RESULTANT RESTING ENERGY EXPENDITURE AND RESPIRATORY EXCHANGE RATIO

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Background: Resting Energy Expenditure (REE) and Respiratory Exchange Ratio (RER) is crucial information to aid practitioners in assessing a client's dietary needs and aspects of substrate utilization throughout exercise and at rest. There is a multitude of literature on the criteria for what constitutes an acceptable test, however, there is minimal knowledge on whether the methods used to obtain these criteria influence the final result. The purpose of this study was to obtain REE and RER from the same test using 3 distinct methods and assess the variation in the final result. Methods: 20 males (n=10; 23.3±3.8yrs) and females (n=10; 23.2±6.1yrs) underwent two 20min REE assessments via indirect calorimetry on two occasions for a total of 4 assessments. REE and RER were then calculated from each test using 3 methods, the first acceptable 5min period (REE CV <5%; M1), 5min period with the lowest CV (M2), and the average of the final 15min (M3). In all instances, the first 5min of each test were discarded. A one-way RMANOVA was used to determine differences between methods for the final REE and RER. Significance was accepted at p≤0.05.Results: A significant main effect of method was noted for REE (p<0.001) but not RER (p=0.778). Post hoc pairwise comparisons with a Bonferroni correction noted significant differences between M1:M2 (1801±397 vs 1773±382 kcals/day; p<.001) and M1:M3 (1801±397 vs 1781±400 kcals/day; p=.019). No significant differences were seen between M2 and M3 (p=.594). Conclusions: These data suggest that the method used to assess REE assessments may impact the final REE but not RER. Utilizing the first acceptable 5min period (M1) produced greater REE values than either the best 5min (M2) or solely averaging the final 15min of the test (M3). Thus, it is recommended that practitioners conduct a full 20min test and select the best 5min rather than concluding the test upon detecting an acceptable 5min block to avoid potential overestimation of REE.

P405: IDENTIFICATION OF METABOLIC PHENOTYPES THROUGH METABOLIC FLEXIBILITY AND ACUTE STRESSORS
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BACKGROUND: Metabolic flexibility describes the body's ability to respond and adapt to a stressor by switching between carbohydrate and fat oxidation. While there are many molecular mechanisms contributing to metabolic flexibility, few studies have examined the fuel selection during acute stressors in pathophysiological states such as obesity. Regarding obesity, previous literature has determined that an individual may be more susceptible to body weight fluctuations based on their metabolic phenotype (MP) classification, denoted as thrifty and spendthrift phenotypes. Individuals who are thrifty largely restrict energy expenditure (EE) during times of famine or fasting, and have smaller increases in EE when overfed, thereby making them more susceptible to obesity. These MP have been identified from changes in metabolic rate when exposed to various dietary interventions, however, little has been done in examining the link between these phenotypes and acute stress responses. The cold pressor test (CPT) is an example of an acute stress response which is used to test the autonomic nervous system in the body and the accompanying cardiovascular and hemodynamic responses. However, this intervention could be used in conjunction with indirect calorimetry to gain insight on the acute response in substrate oxidation and respiratory exchange ratio (RER). The aim of this study is to learn about the potential connections between metabolic phenotypes and metabolic flexibility (MF) through acute stressors. METHODS: I plan to recruit 15-20 subjects between the ages of 18-45. Each participant will complete four resting energy expenditure (REE) tests interspersed with eucaloric washout days using a MGC Diagnostic metabolic cart and face tent. The REE tests include 2 baselines, a 24h-fast, and 2x daily caloric needs of low-protein overfeeding (LPO). The CPT will be performed after the second baseline to analyze MF, while the dietary interventions will determine MP. Results will be analyzed using repeated measures ANOVA to determine the impact of fasting and LPO on REE, as well as the impact of CPT on change in RER. ANTICIPATED RESULTS: It is hypothesized that the CPT will demonstrate increases in RER, and thrifty phenotypes will have a blunted response reflecting metabolic inflexibility.

P406: CHANGES IN UNHEALTHY SNACKING BEHAVIORS IN PRE-MENOPAUSAL WOMEN DURING A BRISK WALKING INTERVENTION
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BACKGROUND: On average, US adults snack up to three times per day, contributing ~22% to total daily energy intake. Unhealthy snacks, which are high in energy, sugar, and fat, are positively associated with adverse health outcomes and these associations may be more pronounced for snacking which occurs later in the evening. It is unclear how unhealthy snacking behaviors change in response to starting an exercise program, but adverse changes could offset the metabolic benefits of the exercise program. METHODS: Previously inactive, pre-menopausal women (n=98, age 35.9 ± 6.1, 76% white non-Hispanic, BMI 29.8 ± 8.2) completed an 8-week walking intervention with the aim of accumulating 150-minutes of MVPA each week. ActiGraph GT3X+ monitors were worn for one week at baseline and throughout the intervention to measure changes in MVPA. Dietary variables were measured via the National Cancer Institute's ASA24 program on randomly selected days (3d at baseline, 6d during the intervention). Snack episodes were self-defined, with unhealthy snacks identified as those containing foods high in total fat (≥20%) and sugar (≥15%), excluding beverages. Late-night snacking was defined as any snacking episode occurring at or after 9 PM, provided it was at least one hour after dinner. Unhealthy late-night snacking referred to episodes that met the criteria for unhealthy snacks. RESULTS: Significant reductions in caloric intake from all snacks (-45.24 ± 205.21 kcal, $p = 0.03$) and unhealthy daily snack frequency (-0.14 ± 0.32, $p = 0.02$) occurred during the intervention (compared to baseline). No significant changes were seen in either the frequency (-0.01 ± 0.31, $p = 0.68$) or caloric intake (19.48 ± 216.34, $p = 0.89$) from unhealthy late-night snacking. After adjusting for baseline levels, none of the changes in unhealthy snacking metrics were significantly associated with the magnitude of change in MVPA during the intervention (all $p > 0.30$). CONCLUSIONS: Among previously inactive pre-menopausal women, increasing MVPA via a brisk walking program did not result in adverse compensatory changes in unhealthy snacking behaviors. Instead, a modest reduction in unhealthy snacking frequency was observed, suggesting that such interventions can positively influence snacking patterns. Grant Funding: NHLBI-1R21HL113742-01

P407: PHYSICAL ACTIVITY INTERVENTION FOR UNDERSERVED PATIENTS WITH TYPE 2 DIABETES
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In the US, chronic disease rates have increased significantly in the past 20 years, particularly type 2 diabetes. Rural, low socioeconomic status (SES), and minority populations are at an increased risk of developing type 2 diabetes. Tailoring physical activity (PA) interventions to these at-risk populations includes finding ways to help people address and overcome their barriers to PA while building self-efficacy in cost-effective, sustainable, and feasible ways. BACKGROUND: To examine the impacts of an innovative PA intervention for rural, low SES, and minority individuals with type 2 diabetes who seek medical care from the safety net clinics in rural Eastern North Carolina. METHODS: Participants were recruited from 4 safety net clinics in Eastern North Carolina that serve residents from 10 counties. Inclusion criteria included being between 18-65 years old, a lack of health insurance, being a current patient at 1 of the 4 participating clinics, having a medical diagnosis of pre-diabetes or type-2 diabetes, and fluent in English or Spanish. Participants attended bi-weekly group classes, including PA demonstrations tailored to the patient population and informational handouts. RESULTS: A statistically significant decrease was found in perceived stress with post-intervention 12.3±9.3 scores averaging 2.3 points lower than pre-intervention scores 15.2±7.5 ($p = .01$, $t = 2.66$). Patients' confidence in their ability to engage in PA also significantly increased ($p = .02$). Days per week engaging in PA significantly increased by 1.2 days per week from 2.8±2.3 days pre-program to 4.0±1.9 post-intervention ($p < .001$, $t = -3.82$). Satisfaction was very high with almost all responses (98.9%) indicating patients were "Very Satisfied" or "Satisfied" with the class. CONCLUSIONS: Findings demonstrate that this intervention increases PA participation in patients, therefore, it was determined that innovative physical activity programming may be a cost-effective, sustainable, and feasible way to increase PA engagement in rural, low SES, and minority populations with type 2 diabetes. Future research should measure PA with objective measures and examine the long-term benefits of an intervention using a follow-up assessment. Grant or funding information: The Duke Endowment, HHP Experiential Award

P408: IMPACT OF THE LIFETIME FITNESS PROGRAM ON COLLEGE STUDENTS' FITNESS PROFILES
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BACKGROUND: Physical inactivity among college students is a growing public health concern. Many students fail to meet physical activity (PA) recommendations, and the transition to college often results in further decreases in PA levels. This decline is linked to increased health risks and decreased overall well-being. Required college-student PA programs have been proposed as a potential solution, but the effectiveness of these programs remains understudied, and it is unclear whether PA program participation translates to improved fitness profiles. The Lifetime Fitness (LFIT) program at the University of North Carolina is a required one-credit PA course designed to promote PA among students. This study will evaluate the overall effect of LFIT on fitness profiles and identify how different LFIT classes (e.g., jogging, yoga) and individual socio-demographic and psychosocial factors influence changes in fitness profiles. METHODS: This study will use a quasi-experimental pretest-posttest design with approximately 2,600 undergraduate students enrolled in twice weekly (50 minutes/session) LFIT classes. Fitness assessments at the beginning and end of the semester will measure cardiorespiratory fitness (3-minute step test), muscular endurance (1-minute push-up and sit-up tests), and flexibility (sit-and-reach test). PA levels will be self-reported using the International Physical Activity Questionnaire. Multiple linear regressions will evaluate pre-to-post changes in fitness profiles, controlling for LFIT class type, sex, age, ethnicity, baseline PA levels, and self-reported class attendance. Analyses will be conducted in R software (v4.4.0), with a significance level of < 0.05. ANTICIPATED RESULTS: We expect that LFIT participation will improve student fitness profiles as measured by changes in cardiorespiratory

fitness, muscular endurance, and flexibility but that LFIT class type and baseline fitness and PA levels will likely moderate the effect.

P409: ASSESSING ENJOYMENT IN EXERCISE AND VIRTUAL PHYSICAL ACTIVITY

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BACKGROUND: Most Americans engage in too little physical activity, which may be driven by a host of factors including low enjoyment and feelings of aversion toward the behavior. Recent evidence has suggested that traits of an activity-including whether the individual finds it distracting or enjoyable-can moderate perceptions of intensity. This has driven an interest in gamified versions of activity, including popular virtual reality delivered exercise programs, with users anecdotally reporting enjoyment and an ability to tolerate greater intensity relative to conventional exercise. At present there is limited scientific data on the relationships between actual and perceived intensity during conventional exercise relative to gamified immersive activity. METHODS: This study will plan to recruit 30 male and female participants between the ages of 18-64 who do not engage in high intensity aerobic activity. Each participant will complete baseline questionnaires including but not limited to physical activity, activity intensity preference and tolerance, and stress, and will be fitted with a Polar H10 heart rate monitor. After measuring resting heart rate, they will complete one 10-minute treadmill block and one 10-minute virtual reality exercise block, each targeting the same perceived exertion. Participants will rate their exertion and affective state throughout, adjusting intensity as needed. They will rate enjoyment and exertion immediately after completing each activity. During a second and third session the participant will repeat the activity blocks, and the order of activities will be randomized across sessions. Descriptive statistics, including mean (SD) for continuous variables and n(%) for count variables, will be used to characterize the sample. Mixed effects regression will be used to investigate whether either mode of activity results in greater enjoyment and discrepancy between real and perceived exertion. ANTICIPATED RESULTS: It is hypothesized that a higher level of enjoyment and greater discrepancy between perceived and actual exertion will be correlated with virtual physical activity compared to walking on a treadmill.

P410: THE IMPACT OF BMI ON THE CADENCE-BASED WALK-TO-RUN TRANSITION THRESHOLD

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BACKGROUND: The walk-to-run transition (WRT) is characterized by the spontaneous and abrupt change in gait from walking to running. Previous research has identified cadence thresholds of 135 and 140 steps per minute as predictors of the WRT (accuracy > 90%). However, there is limited evidence showing whether anthropometric characteristics, such as body mass index (BMI) affect the cadence-based WRT. PURPOSE: To examine potential differences in the cadence-based WRT among BMI groups. METHODS: Forty-four young adults (22 ± 3.5 years, BMI 24.5 ± 4.0 kg/m^2, 68% Female) performed 4 × 3-min treadmill bouts at 0.89, 1.34, 1.78 and 2.24 m/s (2, 3, 4, and 5 mph). BMI was categorized as underweight/normal (<25 kg/m^2) and overweight/obese (≥25 kg/m^2). Cadence was calculated from the directly observed step count per bout (hand tallied steps, verified from video recording) divided by bout duration. The WRT was identified via direct observation of walking vs. running gait during each trial (confirmed from video recording). Receiver operating characteristic (ROC) curve analysis was used to identify the optimal cadence threshold (Youden's index; sensitivity + specificity - 1) for each BMI group, including 95% confidence intervals (bootstrap n = 20,000 replicates). Subsequently, sensitivity, specificity and accuracy values were obtained for these optimal thresholds using confusion matrices. RESULTS: The optimal cadence-based WRT thresholds varied by BMI group. Specifically, the underweight/normal BMI group had a higher WRT threshold (142 [95% CI: 140, 145] steps/min, sensitivity = 100%, specificity 94.4%, accuracy = 95.7%), compared to the overweight/obese BMI group (138 [95% CI: 137, 143] steps/min, sensitivity = 100%, specificity = 100%, accuracy = 100%). However, these differences were not statistically different (based on overlap of 95% CIs). CONCLUSION: Our analysis revealed an earlier (lower) cadence-based WRT in the overweight/obese BMI group compared to the underweight/normal BMI group. These findings reiterate the importance of considering anthropometric characteristics, not limited to but including BMI when examining gait variables.

P411: IMPACT OF ACCELEROMETER WEAR LOCATION ON OUTPUT DURING PHYSICAL ACTIVITY MONITORING IN VIRTUAL REALITY EXERGAMES

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BACKGROUND: Accelerometry can be used to measure physical activity but has rarely been used to quantify physical activity during non-ambulatory, yet active virtual reality (VR) exergames in youth. The optimal wear location of device-based physical activity monitoring in VR exergames that require intensive upper body movements, but with limited ambulation is unknown. This study compared accelerometer step cadence (steps/minute) and triaxial vector magnitude activity counts per minute (CPM) across three wear-sites during 5 conditions: seated rest, walking, tradition gaming, and two VR exergames. **METHODS**: Youth (n = 23; age, 9.4 ± 1.2 yr) completed five, 10-minute conditions: seated rest, seated video game Katamari Forever (SVG-KF), treadmill walk (5.6 km/h, 0% grade) (TW), and two VR exergames: Beat Saber (BS), and Thrill of the Fight (TOF) while right hip- (RH) and right and left wrist-worn (RW and LW) Actigraph GT9X accelerometers collected step cadence, and CPM. Accelerometer output was analyzed with 3x5 two-way repeated measures ANOVA. **RESULTS:** Step cadence and CPM were not significantly different between rest and SVG-KF across all wear-sites, and were significantly less than TW, BS, and TOF. RH TW step cadence (94.1±29.0) was greater ($p<0.05$) than RW (50.8±14.8) and LW (57.3±15.4), however BS (RW: 55.3±13.5; LW: 57.3±14.0; RH: 10.0±24.4) and TOF (RW: 46.3±9.3; LW: 43.5±9.1; RH: 23.2±9.5) step cadence was less at RH ($p<0.05$). TOF CPM was significantly different between RW (313.2±105.6), LW (242.0±74.6), and RH (50.4±18.9, $p<0.05$). CPM for BS (RW: 170.6±72.7; LW: 181.3±83.0; RH: 17.9±17.9) and TW (RW: 103.7±40.9; LW: 105.3±37.6; RH: 62.9±20.6) were similar between RW and LW, but significantly greater than RH ($p<0.05$). **CONCLUSIONS:** Wear location did not impact accelerometer output during SVG and rest conditions. During walking and VR exergames, accelerometer output for RW and LW were generally similar, but very different from the RH. Wrist-worn accelerometers maybe useful to capture the unique upper extremity movement movements of VR exergames, while hip-worn accelerometers may better reflect ambulatory exercise. Future work could use measured VO2 to develop an energy expenditure prediction equation for VR exergames at each accelerometer location.

P412: THE EFFECTS OF EXERCISE ON AEROBIC FITNESS AND COGNITION IN PATIENTS WITH COGNITIVE IMPAIRMENT

Hannah Haukos, Jeffrey A. Katula. *Wake Forest University, Winston Salem, NC.*

BACKGROUND: Alzheimer's Disease (AD) is a neurodegenerative disease that currently impacts 6.5 million Americans, is the most common cause of dementia, is the 6th leading cause of death, and costs the public health system more than $300 billion annually. Evidence suggests that exercise has the potential to meaningfully improve brain function and structure in older adults through improvements in aerobic fitness, but findings are equivocal. The purpose of this study is to test the impact of two different types of exercise, aerobic (AX) vs. stretching/balance (SBR) on aerobic fitness and cognition in older adults with Mild Cognitive Impairment (MCI). METHODS: The EXERT study randomly allocated volunteers (n=289) into either AX or SBR for a 12-month intervention. Both conditions involved exercise at a local YMCA 4 times/week with a YMCA personal trainer. The AX involved moderate/high intensity training (70-80% heart rate reserve [HRR]) and SBR low intensity (less than 35% HRR). Aerobic fitness (AF) was estimated from variables obtained during a 400-meter walk test and included performance time, sex, and systolic blood pressure. RESULTS: An analysis of covariance in which change in AF was the dependent variable with baseline AF and age as covariates revealed that the AX group experienced significantly different changes in AF as compared to the SBR group (Mean AF change: AX=0.53 ml/kg/min; SBR=-1.04 ml/kg/min; p<.05; ES=0.35). Additionally, AF was associated with measures of cognitive functioning at baseline and

12-month follow-up. CONCLUSION: The study's results will be useful in elucidating the relationship between AF and cognition within a population of individuals with MCI.

P413: STEPS, BODY FATNESS, AND CARDIOMETABOLIC RISK IN YOUNG/MIDDLE-AGED ADULTS - THE CARDIA STUDY

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Background: Throughout the last century, overweight and obesity have become increasingly prevalent across all age groups, and while it is multifactorial, insufficient physical activity is a key contributor. While excess body fat is the primary result, it can also contribute to various comorbidities. Recent studies have shown that steps expressed relative to fat mass predict body fat percentage and key indicators of cardiometabolic risk, and may provide for using step count targets to improve weight and cardiometabolic risk management. The purpose of this study was to examine the relationship between step counts and cardiometabolic risk using data from the Coronary Artery Risk Development in Young Adults (CARDIA) data set.
Methods: In year 20 of the CARDIA study (1985-86), a subset of the sample carried a pedometer for eight days, underwent a DEXA scan to assess body composition, and provided blood samples to assess several markers of cardiometabolic risk (e.g., HDL-cholesterol, fasting glucose, fasting insulin). RelSTEPS (steps/kg fat mass/day) was determined by dividing average daily step counts (steps/day) by fat mass (kg). Regression analysis was performed to determine significant predictors of body fat percentage and cardiometabolic risk markers. The alpha level for all statistical analyses was 0.05.
Results: A total of 163 participants were included in the analysis - 57 men (age = 45.32 ± 3.43 years, weight = 89.6 ± 13.6 kg, body fatness = 23.27 ± 5.33%) and 106 women (age = 45.55 ± 3.79 years, weight = 77.9 ± 19.3 kg, body fatness = 35.87 ± 7.71%). RelSTEPS and sex were significant predictors of body fatness (r^2=0.67, p=<0.001), HDL-cholesterol (r^2=0.19, p=<0.001), and quantitative insulin sensitivity check index [QUICKI] (r^2=0.32, p=<0.001).
Conclusion: A model that included RelSTEPS and sex significantly predicted body fat percentage, HDL, and QUICKI in a subset of participants in the CARDIA study. This finding suggests that it may be possible to determine step count targets to yield predictable changes in body weight/composition and cardiometabolic risk in middle-aged adults.

P414: EVALUATION OF GARMIN AND FITBIT ALGORITHMS TO AUTOMATICALLY DETECT CHILDREN'S SEMI-STRUCTURED ACTIVITIES AND DURATION

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BACKGROUND: Consumer wearables with automatic activity detection algorithms have the potential to improve the assessment of children's physical activity energy expenditure. This study will evaluate the ability of Garmin Move IQ and Fitbit SmartTrack automatic activity detection algorithms to detect children's activity type and duration compared to direct observation (DO). **METHODS:** Children (n=17, 11.0 ± 1.6 years, 58.8% female) completed a ~60-minute, semi-structured activity protocol while wearing a Garmin Vivoactive 4S and a Fitbit Sense concurrently on their nondominant wrist. The watches were counterbalanced with each protocol, and children's activities were measured via DO. The protocol was counterbalanced and consisted of 3 activities (walking, running [run 10 meters following the sound of an audio recording], and outdoor biking), each separated by seated rest and lasting ≥ 10 minutes. Activity type and duration data from Garmin and Fitbit were exported via Fitabase and translated into 1-second epochs. Epoch-by-epoch (i.e., accuracy) and measurement agreement (i.e., absolute error) analyses were conducted to evaluate the performance of Garmin Move IQ and Fitbit SmartTrack for detecting children's activity type and duration compared to DO. **RESULTS:** Garmin Move IQ correctly predicted biking 71.9% (95%CI=54.9%, 88.8%), running 5.8% (95%CI=-5.6%, 17.2%), and walking 47.6% (95%CI=25.6%, 69.5%) of the time, while Fitbit SmartTrack correctly predicted biking 63.9% (95%CI=43.5%, 84.3%), running 82.1% (95%CI=67.3%, 97.0%), and walking 49.1% (95%CI=28.9%, 69.4%) of the time. For duration, Fitbit SmartTrack produced lower mean absolute errors (biking=3.2±4.6 minutes, running=3.7±7.8, walking=10.5±13.1) than Garmin Move IQ (biking=5.3±4.6 minutes, running=9.5±2.4, walking=16.6±10.3). **CONCLUSIONS:** Preliminary analyses suggest Move IQ and SmartTrack algorithms have low overall performance for detecting walking, biking, and running activities and duration among children.

P415: SPEED-CADENCE ASSOCIATION AND STATURE DURING RUNNING BOUTS IN 18-20 YEAR OLDS

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BACKGROUND: This study evaluated relationships between speed, stature, and sex with cadence (steps/min) during running.METHODS: Stature (height, in cm) was measured using a stadiometer. Participants completed at least one 5-min treadmill running bout in a larger study of walking/running. Observed steps were hand-tallied. A linear mixed effects model was fitted to explain cadence, accounting for multiple bouts per participant using a participant random intercept, and with covariates sex, speed, and height. Backward elimination variable selection was used to model relationships. Visualizations were created to demonstrate associations uncovered within the final linear mixed effects model. They corresponded to the cadence expected value (and 95% CI) for each value of the included covariates, as well as a 3-dimensional surface equivalent of the aforementioned graphs.RESULTS: Forty-nine participants (mean age=19.16 ± SD 0.78 years, 38.8% female, mean height=170.77 ± SD 9.51 cm) completed 138 5-min running bouts ranging from 2.5-6.0 mph. The initial model showed that neither sex (p=0.99) nor height (p=0.153) was statistically significant, although speed (p<0.0001) was significantly associated with cadence accounting for these other variables. In the final model, sex was removed. Controlling for height, speed was significantly associated with cadence (p<0.001), and there was a trend toward significance (p=0.056) for height when accounting for speed. The marginal r-squared for the fixed effects indicated that 32.6% of the variability in cadence was explained by the fixed effects of speed and height.CONCLUSION: With a trend toward a significant association between stature and cadence when accounting for speed in this limited sample, further exploration is warranted. Overall, this study highlights the potential for personalized approaches to describing the relationship between running cadence and stature in young adults. This study is funded by NIH NICHD R01HD105768.

P416: COMPARING PUBLIC AND PRIVATE SCHOOL DATA FROM PHYSICAL ACTIVITY CLEARINGHOUSE FOR EDUCATION (P.A.C.E.) STUDY

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Purpose: Measuring physical activity levels in children is valuable for determining possible causes for obesity prevalence within the state of Mississippi. In 2007, The Mississippi Department of Education instituted *The Healthy Students Act*. This mandates all children K-8th grade attending a public school should get a minimum of 150 minutes of physical activity-based instruction per week. While this document sets a standard for physical activity (PA) in public schools, private schools are lacking insources of accountability. This study aims to provide insight into the differences in PA levels in south central Mississippi schools, both private and public institutions. **Methods:** Students from local elementary schools3rd-6th grade), wore Actigraph GT9x accelerometers for 5 consecutive days during school hours. Teachers were asked to log start and stop times for recess and P.E. to allow a comparison of opportunity time to time spent at different intensities. Following data collection, accelerometer data was analyzed using Actigraph software (v6.13.6) and statistical analysis performed with SPSS (v29.0) **Results:** Students from the private school (n=54) spent 23.71% and 23.61% of their recess and P.E. at a moderate to vigorous intensity, respectively. Students from the public school (n=53) spent 27.75% of recess and 16.8% of P.E. at moderate to vigorous intensity. When comparing these values relatively, the data reflects the private school's percent MVPA during P.E. approaches a statistically significant value to the public institution (p=0.77). **Conclusion:** Though the overall percent of MVPA was higher in the public school, this is the result of increased opportunity time. The private school offered significantly less opportunity time in both P.E. and recess (p<0.001), a higher percent MVPA is reflected during P.E. A designated P.E. instructor programming exercise for the entire school can provide efficient movement practices that result in elevated levels of MVPA. Increased amounts of opportunity time do not always lead to increased MVPA. Despite the differences in PA levels between the two

institutions, both schools still fall short of the physical activity recommendations set by the state.

P417: COMBINED STRENGTH AND HYPERTROPHY TRAINING RESULTS IN GREATER CORTICAL AND SPINAL EXCITABILITY THAN STRENGTH ALONE

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Purpose: To examine the effects of a strength (S) in comparison to combined strength and hypertrophy (S+H) focused resistance training on cross-sectional area (CSA) of the vastus lateralis (VL), lower body maximal strength, and cortical and spinal excitability of the knee extensors. **Methods:** 34 untrained males (age = 23 ± 4 yrs) were randomized into either a S (n = 12), S+H (n = 12), or a control (CON; n = 10) group. Before (PRE) and after (POST) a 6-week intervention, CSA of the dominant VL was obtained via ultrasonography, followed by participants performing a one-repetition maximum (1RM) on a leg press device. Additionally, participants performed maximal voluntary contractions (MVCs) of the knee extensors on a dynamometer, followed by transcranial magnetic stimulation over the motor cortex during a 10% MVC contraction to examine peak-to-peak motor evoked potential (MEP) amplitude. Furthermore, spinal magnetic stimulation over the 2nd lumbar vertebrae at rest was performed to examine spinal MEP (SMEP) amplitude. Surface electromyography was recorded from the VL to examine peak-to-peak amplitudes. The S group completed 16 training sessions comprised of 3 knee extensions MVCs, followed by 3 sets at 90% 1RM for one repetition on the leg press. The S+H group performed the same training as the S group; however, they performed 3 additional sets at 45% 1RM for as many repetitions until they reported 2 repetitions left in reserve. To account for variability amongst groups, change scores (Δ=POST - PRE) were calculated for all dependent variables. Separate one-way ANOVAs (group [S vs. S+H vs. CON]) were used to examine potential differences in ΔCSA, Δ1RM, ΔMVC, ΔMEP, and ΔSMEP. **Results:** There were one-way interactions for all dependent variables ($p < 0.05$). ΔCSA was greater for S+H compared to S and CON ($p < 0.05$). Both S and S+H had a greater increase in Δ1RM and ΔMVC than CON ($p < 0.05$), but were similar to each other. The increased ΔMEP was greater for S+H compared to S and CON ($p < 0.05$). The increased ΔSMEP was greater for S+H only compared to CON ($p < 0.05$). **Conclusion:** Despite a greater increase in CSA, MEP, and SMEP for S+H, there were similar increase in maximal strength between training groups. It is unclear if cortical and spinal excitability improved due to training or if the (S)MEP amplitudes were dependent on changes in muscle mass.

P418: CONSTRUCT VALIDITY OF A CLINICAL SEATED TRUNK CONTROL TEST

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BACKGROUND: Trunk neuromuscular control training plays an integral part in rehabilitation, injury prevention, and athletic performance programs. Most current clinical tests for trunk neuromuscular control focus on muscle strength or endurance. Clinical tests that address isolated trunk control, focused on proprioception and movement accuracy performance, have not been fully validated. The study objective was to evaluate the construct validity of a clinical test of trunk neuromuscular control against a biomechanical reference standard. METHODS: A sample of 22 healthy participants (age 25.7 ± 4.9 y) performed both the biomechanical and clinical tests in a random order after familiarization and warm up trials. During the clinical test, participants sat on a 20-inch balance board (sphere 10 degrees) with their eyes closed and arms and ankles crossed. Using only their trunk, they were asked to balance and keep the board from touching the support surface. An error was counted each time the participant came out of position, or the board contacted the surface. Five 30-second trials were performed. Errors were summed across the trials with higher scores representing poorer control. The biomechanical reference test had seated participants balancing an unstable chair atop a force platform for three 30-second eyes closed trials. The center of pressure data were used to calculate a 95% confidence ellipse area (CEA) for each trial, with higher CEA representing poorer performance. A Pearson correlation between the error total and average CEA was used to determine the construct validity of the clinical test. RESULTS: Participant performance on the clinical test ranged from 3 to 38 errors and the CEA ranged from 81.2 to 639.8 mm^2. The two tests were moderately positively correlated (r = 0.517, p = 0.014). CONCLUSION: The findings suggest that the clinical seated trunk control test could serve as an alternative to the laboratory based biomechanical test of trunk neuromuscular control that emphasizes proprioception and movement accuracy.

P419: AEROBIC FATIGUE ALTERS REACTION TIME AND MOVEMENT VELOCITY WITHIN COLLEGIATE CLUB SOCCER PLAYERS

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BACKGROUND: Soccer requires immense amounts of balance and body control while simultaneously running long distances at varying intensities. However, it is unknown how aerobic fatigue impacts an athletes Limits of Stability (LOS). The purpose of this study was to determine how aerobic fatigue can impact reaction time, movement velocity, and directional control within men's collegiate club soccer players. **METHODS:** Eleven NCAA male collegiate club soccer players (age: 19.73 ± 1.27 years, height: 178.10 ± 5.99 cm, mass: 72.64 ± 9.21 kg) completed the study. Participants initially performed a dynamic warmup with no constraint on time. A baseline LOS test was then completed on the NeuroCom® Balance Master®, which included leaning towards 8 targets separated by 45° while barefoot. Immediately after baseline values were collected, participants completed a VO_{2max} treadmill test following the Costill and Fox (1969) protocol where the speed remained constant at 3.98 m/s and the incline increased 2% every two minutes. Following the VO_{2max} test, participants completed another LOS test. A paired sample t-test with an alpha level set at $p<0.05$ was used to compare reaction time, movement velocity, and directional control pre- and post-fatigue for all eight targets. **RESULTS:** There were no significant differences ($p > 0.05$) for directional control, however, reaction time significantly decreased (p = 0.002) pre- (1.52 ± 0.42 s) to post-fatigue (1.06 ± 0.28 s) for target #1 while movement velocity significantly increased for targets #2 (p = 0.025; pre: 3.45 ± 1.36 °/s, post: 4.61 ± 2.33 °/s), #4 (p = 0.004; pre: 2.48 ± 0.98 °/s, post: 3.53 ± 1.53 °/s), #6 (p = 0.001; pre: 2.65 ± 0.84 °/s, post: 4.05 ± 1.61 °/s), #7 (p < 0.001; pre: 3.15 ± 0.98 °/s, post: 5.42 ± 1.98 °/s), and #8 (p = 0.048; pre: 3.79 ± 1.41 °/s, post: 4.86 ± 1.76 °/s). **CONCLUSION:** Data indicates reaction time and movement velocity significantly improve within collegiate club soccer players who are aerobically fatigued.

P420: THE EFFECTS OF ACUTE STRETCHING ON ANKLE BIOMECHANICS IN PICKLEBALL MANEUVERS

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BACKGROUND: Pickleball is emerging as an important injury topic due to its ease of play, exercise benefits, and rapid growth among seniors.[1] However, senior pickleball injuries are increasing rapidly while senior tennis injuries have remained flat.[2] Little is known about pickleball-specific movements investigated and their effects on the lower extremity, specifically the ankle. The purpose of this study will be to investigate effects of acute static stretching on ankle biomechanics during pickleball-style movements. METHODS: 27 participants, aged 18-80, who are recreationally active and have played pickleball at least once will be recruited. Participants will complete two separate days of testing for baseline and experimental measurements. The experimental protocol will include an 8-minute stretching session targeting the gastrocnemius and soleus muscles of each leg. A one-way repeated measures analysis of variance will be used to detect differences between the pre-test and post-test dependent variables. We hypothesize that 1) static ankle stretching will increase ankle dorsiflexion range of motion during pickleball cutting and lunge tasks; 2) ankle angular velocity would increase after stretching during cutting tasks; 3) external ankle moment would not be different after stretching; and 4) ankle power would not be different after stretching. ANTICIPATED RESULTS: We expect the results of this study will help us determine if an acute static stretching session can decrease ankle injuries during common pickleball movements. Understanding these injury mechanisms can highlight the importance of further researching dangerous pickleball maneuvers with the sport's increasing popularity. REFERENCES: 1. Forrester MB. Pickleball-Related Injuries Treated in

Emergency Departments. *Journal of Emergency Medicine*. 2020;58(2):275-279. doi:10.1016/j.jemermed.2019.09.0162. Weiss H, Dougherty J, DiMaggio C. Non-fatal senior pickleball and tennis-related injuries treated in United States emergency departments, 2010-2019. *Inj Epidemiol*. 2021;8(1). doi:10.1186/s40621-021-00327-9

P421: ACUTE EFFECTS OF CONTRACTION SPEED DURING MOTOR IMAGERY ON CORTICOSPINAL AND MUSCLE FUNCTION RESPONSES

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BACKGROUND: Motor Imagery (MI) is the imagination of a movement without physical muscle contraction. Acute MI has been shown to increase strength and corticospinal excitability, but few studies have placed emphasis on the rate of torque development (RTD) during MI or as an outcome following MI. RTD refers to how quickly skeletal muscle generates torque and is associated with mobility in aging and clinical populations. MI has implications for these populations where traditional strength training is not possible, so it is important to determine its effect on RTD. Corticospinal responses to MI are muscle and task specific, but it is unclear if the speed of imagined muscle contractions affects neural responses. This study aims to determine the acute effects of fast and slow imagined contractions on corticospinal responses and RTD. METHODS: Eighteen young (18-30 yrs), healthy subjects will complete 4 laboratory visits in randomized order, including a familiarization session, control, and 2 MI conditions. During MI conditions, subjects will imagine 2 sets of 25 repetitions of either fast (i.e., increase torque as fast as possible) or slow (i.e., 3 seconds to peak torque) isometric elbow flexions. Before and after each condition, single pulses will be delivered over the primary motor cortex using transcranial magnetic stimulation to measure motor-evoked potential amplitude and the resulting silent period duration for the bicep brachii to quantify changes in corticospinal excitability and inhibition, respectively. Rapid, maximal voluntary isometric contractions will be used to measure changes in peak torque, RTD, and rate of electromyography rise. Two-way repeated measures ANOVAs will be used to analyze outcomes. ANTICIPATED RESULTS: Compared to control, we expect both MI conditions to acutely increase corticospinal excitability, peak torque, and RTD while reducing corticospinal inhibition, but we expect greater changes in these outcomes following fast MI.

P422: RELATIONSHIPS BETWEEN DORSIFLEXION RANGE OF MOTION AND HOP TEST PERFORMANCE IN COLLEGIATE SOCCER PLAYERS

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BACKGROUND**:** Collegiate soccer athletes typically undergo a variety of preseason examinations conducted by the sports medicine and sports science teams in order to identify potential injury risks or factors that could negatively affect performance throughout a season. These tests are multifaceted ranging from basic vitals to functional performance testing that targets the sport specific demands soccer players experience throughout training and matches within a season. When advanced functional testing is included in the preseason battery of tests for soccer athletes, the ankle and knee function is often a target. Talocrural dorsiflexion range of motion (DFROM) is often used to assess available motion at the ankle and unilateral hop tests are used to assess limb asymmetries that could influence knee injury risk. The relationship between these tests and whether both DROM and hop tests are necessary for a collegiate soccer testing battery is unknown. Thus, the purpose of this study was to examine the relationship between DFROM and unilateral hop test performance at preseason. METHODS**:** 24 male Division I collegiate soccer players were tested for bilateral DFROM in cm at preseason using the Weight Bearing Lunge Test. Hop testing consisted of single leg single hop for distance (cm), triple hop for distance (cm), and 6-meter timed hop (s) per limb. Maximum distance from three trials were calculated for the distance hop tests. Fastest times from three trials were used in the analysis for timed hops. Statistical relationships were assessed using bivariate correlations with significance set a priori at $p \leq 0.05$. RESULTS**:** Bivariate correlation results revealed no statistically significant relationships between DFROM of either limb with any of the hop tests conducted (all $p > 0.05$). CONCLUSIONS**:** The current findings suggest that there are no significant relationships between DFROM and hop test performance in collegiate male soccer players, and therefore, it may be beneficial to include all tests in the assessment of risk factors. These results may aid collegiate coaches, medical staff, and sports science teams in designing preseason soccer screenings, ensuring that they include a variety of assessments for the lower extremity.

P423: THE EFFECT OF HELMET LOADS ON CERVICAL SPINE MUSCULATURE, INTRADISCAL PRESSURE, AND FACET JOINT FORCES

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BACKGROUND: As many as 97% of fighter pilots report experiencing neck pain. This pain has been directly linked to their helmets and interferes with their flying, causes sick leave, and costs the military millions of dollars. The purpose of this study is to use finite element models (FEMs) to analyze the effects of the helmet loads on cervical spine tissues. A secondary purpose is to validate the muscle loads and intervertebral disc (IVD) properties in this FEM. **METHODS:** Two simulations were run with the previously validated VIVA OpenHBM head and neck model. The no helmet (NH) simulation was loaded with gravity and muscle forces. The helmet (H) was loaded the same with the addition of the helmet mass. A PID controller was used to estimate muscle activation required to stabilize the head in a neutral position. **RESULTS:** The NH reaction force at each IVD was 72.1+/-16.6N. This corresponds well with previous literature estimating the head weight and muscle forces to be 73.6N on each IVD. There were large increases in reaction forces from NH (72.1+/-16.6N) to H (90.1+/-13.4N). Total muscle forces increased from 149.0N (NH) to 164.1N (H). IVD pressure distributions correlate well with previous reports in the literature at CORA=0.8778 (NH) and CORA=0.8539 (H). IVD pressure magnitude increases from NH (0.50+/-0.07MPa) to H (0.65+/-0.11MPa). Facet joint forces decreased by 0.850.69N from NH to H at all levels except C5C6 where forces increased by 4.1N. **CONCLUSIONS:** The helmet load is 19N and muscle forces increased 15N, but IVD reaction forces only increased 18N and the total facet force magnitude stayed the same. Thus, other structures in the spine must be taking on supraphysiological loads that may be causing pain and tissue damage. The reaction force magnitude and IVD pressures correlate well with previously reported data, validating the IVD material properties and PID method for muscle activation. This research was funded by the Office of Naval Research [N000142112649].

P424: THE EFFECTS OF INTERNAL AND EXTERNAL FOCUS CUES ON EXERCISE PERFORMANCE

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BACKGROUND
Focus of attention in physical performance refers to where an individual directs their cognitive resources during movement. Previous research suggests that an external focus may enhance performance more than an internal focus. However, the effects of attentional focus on muscle activity and performance in females, in exercises like bicep curls and vertical jumps, are not well known since previously established research is male dominated. This study aims to compare the impact of internal and external focus cues on exercise performance and muscle activation specifically in females. METHODS
Eleven female participants (age 20.91 ± 0.94 years) performed two sets of 10 repetitions under both external and internal focus resulting in a total of 40 bicep curls. The participants also performed two sets of three repetitions under both internal and external focus conditions and one set of three repetitions under no focus for a total of nine vertical jumps. Electromyography (EMG) measured muscle activation in the bicep brachii and vastus lateralis, while a Tendo Unit captured power output. A repeated measures ANOVA and paired samples t-tests were used to analyze differences in muscle activation and performance between focus conditions.
RESULTS
We failed to support the hypothesis. Data showed a statistically significant difference in EMG activity with internal focus cues in the bicep brachii during bicep curls compared to external focus cues ($p = 0.05$). No significant differences were observed in vertical jump performance or muscle activation between focus conditions.
CONCLUSIONS
Our findings suggest that, for females performing bicep curls, internal focus cues may result in greater muscle activation than external cues,

which contrasts with previous studies in male populations. Future research should investigate these effects with larger, more diverse samples and include other exercise modalities.

P425: EFFECT OF DEEP FASCIAL STIMULATION ON SHOULDER PROPRIOCEPTION OF VOLLEYBALL PLAYERS

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BACKGROUND: Shoulder proprioception in volleyball players is important for maintaining precise motor control required for optimal performance. Deep fascial stimulation methods such as foam roller exercises are used to increase fascial elasticity and stimulate proprioceptors. There are a limited number of studies on shoulder proprioception, thus, the aim of our study was to investigate the effect of foam rolling on maximum voluntary isometric contraction (MVIC) and force reproduction (FR). METHODS: A total of 47 female club volleyball players (16.3±1.9 years) residing in Manisa, Turkiye, participated in the study. Each participant completed two trials. First, participants performed 5-min of shoulder warm-up exercises, followed by two MVIC trials and two FR trials with a target force of 50% MVIC (165°). For trial two, participants performed the 5-min shoulder warm-up plus 5-min foam roller exercises (total 10-min warm-up), followed by two MVIC trials and two FR trials. Descriptive statistics, paired t-tests, and Wilcoxon signed rank tests were used to analyze the maximum MVIC values and minimum error of FR. RESULTS: There was a significant increase in MVIC between trial one and trial two (+6.63±10.61, $p<0.001$). FR error improved between trials, but was not statistically significant ($z=-0.83$, $p=0.42$). CONCLUSIONS: Use of foam roller during warm-up had a positive effect on maximal shoulder joint strength. This improvement may be due to the excitation of proprioceptors within the fascia, causing more activation or an increase in neuromuscular efficiency. The FR error improvement suggests potential benefits for proprioception that could enhance performance in volleyball-specific movements. Future studies should investigate this further to provide clearer insights into the role of deep fascial stimulation in neuromuscular control and proprioception.

P426: VALIDITY OF THE POLAR H10 DURING THE DEEP BREATHING AUTONOMIC FUNCTION TEST

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BACKGROUND: Clinical assessment of cardiac-autonomic function often involves the deep breathing test, administered using an electrocardiogram (ECG). The Polar H10 Bluetooth heart rate monitor would make this test more accessible, but its ability to accurately capture inter-beat interval data during large fluctuations in heart rate has received little investigation. Therefore, we aimed to evaluate the level of agreement between the Polar H10 and ECG during the deep breathing test. METHODS: Data from twelve apparently healthy adults (66% female, 22.4 years, 28.5 kg/m2) met inclusion criteria for analysis (0 ectopic beats) from this ongoing investigation. Participants rested in a supine position for 5 min to stabilize. Subsequently, inter-beat intervals were simultaneously recorded by an ECG (lead II, 1000 Hz) and a Polar H10 during the 1-min deep breathing test. Participants followed breathing prompts from a tablet screen during the test which displayed 5-s inspirations and 5-s expirations (0.1 Hz). Inter-beat interval files were analyzed in Kubios Scientific HRV software to calculate the expiratory-to-inspiratory ratio (E/I) and respiratory sinus arrhythmia (RSA). Comparison statistics included paired t-tests and Bland-Altman analyses. Relative and absolute agreement were assessed with Lin's concordance correlation coefficient (CCC) and the coefficient of variation (CV), respectively. RESULTS: The E/I and RSA for ECG (1.28 ± 0.12 and 15.1 ± 6.7 beats·min-1, respectively) and Polar H10 (1.28 ± 0.12 and 15.2 ± 6.8 beats·min-1, respectively) demonstrated minimal mean biases (0.0 ± 0.0 and 0.1 ± 0.1 beats·min-1, respectively, Ps ≥ 0.66), tight 95% limits of agreement (-0.02 - 0.02 and -0.9 - 1.1 beats·min-1, respectively), along with near perfect relative (CCC ≥ 0.99) and absolute agreement (CV ≤ 1.7%). CONCLUSIONS: The Polar H10 provided nearly identical E/I and RSA values to ECG in the current sample of healthy young adults during the deep breathing test.

P427: THE IMPACT OF MAINTAINING KNEE FLEXION ON PULSE WAVE VELOCITY MEASUREMENTS FOLLOWING PROLONGED SITTING

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BACKGROUND: Elevated pulse wave velocity (PWV) is a marker of increased arterial stiffness and cardiovascular disease (CVD) risk. Blood pooling in the lower extremities is a possible mechanism linking acute prolonged sitting with increases in PWV. Current guidelines recommend measuring post-sitting PWV in a supine position with the legs extended. However, this may obscure the true effects of prolonged sitting on arterial stiffness from being measured, as leg extension after sitting likely attenuates blood pooling by promoting venous return. The aim of this study is to compare post-sitting PWV with the legs remaining in 90° of knee flexion versus extended.METHODS: Males and females (N=20) aged 18 to 59 years, free from cardiovascular disease will be enrolled in this randomized crossover study. There are two conditions with standardized pre-assessment criteria. PWV will be measured post-sitting with the legs either (1) remaining flexed (experimental) or (2) extended (control). Pre-sitting measurements occur after a 15-minute supine rest period, with 3 calf circumference measurements, followed by 6 assessments (3 per leg position) of blood pressure (BP), pulse wave analysis (PWA), and carotid-femoral PWV (cf-PWV) using the SphygmoCor® XCEL system. Participants will then complete a 3-hour bout of uninterrupted sitting, during which blood pooling will be continuously monitored using near-infrared spectroscopy (NIRS) and calf circumference After 10-minutes of post-sitting supine with the legs in the randomized position, calf circumference will be again remeasured, followed by final BP, PWA, and cf-PWV assessments.ANTICIPATED RESULTS: It is hypothesized that Post-sitting cf-PWV will be significantly higher (indicative of greater arterial stiffness) in the experimental condition (legs remaining in 90° of flexion) compared to the control condition (legs extended). Should these findings be confirmed, this would implicate blood pooling as a mechanism for sitting-induced increases in PWV and inform methodological choices for future studies investigating the effects of prolonged sitting on arterial stiffness.
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P428: EXAMINING BLACK MEN WHO ARE FORMER COLLEGIATE ATHLETES' PERCEPTIONS OF SPORT AND LIFELONG PHYSICAL ACTIVITY

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Background: Black men account for under half of all athletes in major sports in North America. Many Black men, however, do not engage in physical activity post-athletic career, resulting in lower life expectancies, higher rates of chronic disease, and economic disadvantage. It is important to understand the reasons why Black men participate in sports yet do not continue similar levels of physical activity after their athletic careers. **Purpose:** To examine the impact of sports on Black men's lives, including post-career physical activity levels. **Methodology: T**his qualitative study recruited Black male former Division 1, 2, or 3 athletes (N = 14) using social media, word of mouth, and personal connections. After completing the Informed Consent Document, participants completed a Demographics questionnaire. One-on-one interviews were conducted using a semi-structured interview guide; participants responded to questions about physical, mental, and overall well-being, as well as family life and the environment they were brought up in. Descriptive statistics were completed for demographics. Qualitative data was analyzed using content analysis. The university's Institutional Review Board approved all study protocols. **Results:** Participants (n = 13 Black; 1 = Biracial) were 38.1 ± 7.7 years of age. All participants also completed a four-year degree, with 10 of them completing a master-level degree or higher. Nine of the men played at a Division One college, four played at a Division Two college, and one played at a Division Three college, with three of the participants continuing for a professional career. The majority of men (n = 12) were employed full-time. The four overarching themes that emerged included 1) social influence and support, 2) motivation, 3) benefits of sport, and 4) emotional barriers. **Discussion:** The most pertinent finding was that physical barriers

(e.g., injury) were not the most impactful factor on their lifelong PA, but social and emotional barriers (e.g., mental health, support from others). Study limitations included recruitment, limitations in sports represented (e.g., basketball, football, and track), and the sample size. Future research should examine the social barriers versus the emotional barriers in all Black males - not just athletes - for optimal public health outcomes.

P429: WHAT IS THE CAUSE IN THIS CASE OF LOWER EXTREMITY WEAKNESS?

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BACKGROUND: A 10-year old patient suffered a right hip avulsion fracture while playing football. For ten years following the injury, he experienced chronic pain and progressive weakness of the lower extremity. Consultations with neurology, rheumatology, neuropathology, cardiology, and others involved numerous tests, resulting in a diagnosis of Crohn's disease. The goal of this study is to review literature on possible causes of progressive lower extremity pain and weakness as it relates to the patient's medical test results. CASE PRESENTATION: The patient provided medical history and test results to the researcher. Tests included blood tests, MRIs, muscle biopsies, and nerve conduction studies. When the patient was diagnosed with Crohn's disease in 2021, the doctors prescribed an infliximab infusion, an anti-tumor necrosis factor medication. The medication has drastically decreased the signs of inflammation in the patient's lower extremity, demonstrated through follow-up blood tests and MRIs. LITERATURE REVIEW: Literature review began using key word searches such as "lower extremity pain and weakness", "pediatric lower extremity pain", "pain caused by nervous issues". Creating a focus on pathologies including deep vein thrombosis, motor neuron disease, extraforaminal entrapment, mitochondrial myopathy, and others. CONCLUSION: His signs and symptoms align with those of nervous issues or complex regional pain syndrome (CRPS). CRPS is a diagnosis of exclusion qualifying with an inciting event with unproportional pain and duration, allodynia, temperature asymmetry, and decreased range of motion. The patient presents with all these signs and symptoms. CRPS may be treated using anti-tumor necrosis factor medication to reduce inflammation along with the use of therapies including hippotherapy and spinal cord stimulation with a goal to create an improved quality of life for the patient.

P430: VAGAL NERVE STIMULATION DOES NOT IMPROVE HEART RATE VARIABILITY IN WOMEN WITH RHEUMATOID ARTHRITIS

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BACKGROUND: Vagal modulation is decreased in women with rheumatoid arthritis (RA). Transcutaneous vagus nerve stimulation (tVNS) may increase vagal modulation as demonstrated by increases in vagal measures of heart rate variability (HRV). Therefore, the purpose of this study is to examine the effects of tVNS on vagal measures of HRV in women diagnosed with RA. METHODS: Three women diagnosed with RA (Age: 51±5 years, BMI: 25.1±8.7 kg/m^2) volunteered to participate in this study. Participants came into the laboratory for three visits separated by 10 days. During the first visit, anthropometric data was collected, and participants were familiarized with heart rate (HR) assessment using a chest strap (Polar H10) and mobile phone application (Elite HRV). Participants were instructed to assess their morning HR daily. During the second visit, patients were familiarized with tVNS (Xen) and mobile phone application (Neuvana), and HR data was exported from participants' cell phones (baseline). Following 10 days of tVNS, HR data was re-exported (post). HR data was imported into HRV software (Kubios) to derive HRV measures including: the natural logarithm (ln) of the root mean square of successive differences (RMSSD) and ln high frequency power (HF). Ten-day averages of HR, lnRMSSD and lnHF at baseline and post tVNS were calculated. Significant differences between HR, lnRMSSD and lnHF at baseline and post tVNS were determined using Wilcoxin Signed Rank Tests. Significance was accepted a priori $p<0.05$. RESULTS: There were no significant differences ($p>0.05$) between baseline and post tVNS for HR (baseline=73bpm, post tVNS=75bpm, p=0.11), lnRMSSD (baseline=2.97ms, post tVNS=2.90ms, p=0.41), or lnHF (baseline=4.2 ms^2, post tVNS=3.77ms^2, p=0.11). CONCLUSIONS: The preliminary findings of this study suggest that 10 days of tVNS does not improve vagal modulation in women with RA. Future studies should include a larger sample size to elucidate potential effectiveness of this treatment.

P431: DYNAMIC ASSESSMENT OF METABOREFLEX RESPONSES IN METABOLIC SYNDROME

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BACKGROUND: Previous research indicates that individuals with metabolic syndrome (MetS) demonstrated exaggerated blood pressure responses to metaboreflex (MMX) activation when elicited via post-exercise circulatory occlusion (PECO). However, whether these responses are exaggerated during graded MMX activation during voluntary exercise remains to be answered. **METHODS:** Twelve individuals meeting the NCEP ATP III criteria for MetS and 12 healthy control participants matched for age, sex, race, and ethnicity completed a dynamic assessment of MMX activation which included 8 minutes of voluntary rhythmic handgrip exercise performed at 25% of the maximal voluntary contraction with a 1:1 work to rest ratio and a cadence of 60 contractions per minute. The first 2 minute of each assessment were performed under free flow conditions, after which a cuff was inflated just below the elbow to pressures equal to 40% (minutes 2:00-4:00), 70% (minutes 4:00-6:00), and 100% (minutes 6:00-8:00) of the pressure required to occlude radial blood flow at rest. Beat-by-beat blood pressure (BP) heart rate (HR) were continuously recorded via finger photoplethysmography and a one-lead electrocardiogram, respectively. Repeated measures analyses of variance examined differences in MMX responses across occlusion pressure and between groups. **RESULTS:** As expected, MAP (F=22.3, p<0.001) and HR (F=13.1, p<0.001) both significantly increased across the MMX trials, reaching their maximum during the 100% condition. However, no significant pressure by group interactions were observed for either variable ($p\geq$0.290), and main effects of group were only observed for HR (F=10.4, p=0.005). **CONCLUSIONS:** Based on these findings, the exaggerated MMX responses previously observed using PECO assessments do not appear to extend to dynamic assessments of MMX magnitude performed during voluntary exercise, when central command is intact. **FUNDING:** This project was supported by the National Institute of General Medical Sciences (U54GM115428) and the The University of Southern Mississippi.

P432: INTER-RATER AGREEMENT ON ECG INTERPRETATION AMONG A CARDIOLOGIST, AN EXPERT READER, AND COLLEGE STUDENTS

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INTRODUCTION: Athlete-specific ECG criteria have evolved, leading to greater specificity and reduced false positive rates. Comparisons have been made between local physicians and those from specialized centers in their consistency of ECG interpretation using the 2017 International Criteria. Limited research exists on whether novice ECG interpreters can be trained to accurately interpret athletes' ECGs and further, be able to identify the abnormal condition. This study evaluated the overall and individual inter-rater reliability of novice ECG interpreters and exercise physiologist when compared to a cardiologist. METHODS. Three novice ECG interpreters received training in interpreting athlete ECGs using the 2017 International Criteria under the guidance of an expert reader. During a high school sports screening event, 1,350 ECGs were collected and assigned unique identification numbers. After the screening event, three novice interpreters, a cardiologist, and an Exercise Physiologist independently classified the ECGs as either "normal" or "abnormal" and identified the findings on abnormal ECGs. Information on the athlete's age, gender, race/ethnicity, and sport was included. Overall agreement between the cardiologist, exercise physiologist, and three students was assessed using a Fleiss' kappa analysis and individual pair agreement was calculated using Crosstabs. RESULTS: 1,350 athlete ECGs (males = 879; females = 471, age (mean + SD) 15.09+1.3y) were reviewed and 51 (3.8%) abnormal cases were identified and further diagnosed. The overall inter-rater agreement between a cardiologist, an exercise physiologist, and three student readers in classifying an ECG as normal or abnormal was rated as good (k = 0.711, p < .001). Individual agreement between which ECGs were classified as normal ranged from moderate, (k = .585) to very good (k = .845). Abnormal readings

were further analyzed, and overall abnormal diagnosis agreement was rated as moderate (k = .432, p = 0.00) with individual agreement on abnormal diagnosis ranging from poor (k = .196) to very good (k = .851). CONCLUSION: This study demonstrated that novice ECG readers could correctly classify ECGs based on the International Criteria as "normal and abnormal" but may need further training in accurately identifying ECG abnormalities in athletes.

P433: DAILY EXERCISE , BUT NOT WINE INGESTION, IMPROVES GLYCEMIC CONTROL IN INSULIN-RESISTANT PARTICIPANTS

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BACKGROUND: Ethanol increases insulin secretion in response to ingested carbohydrates and exercise enhances insulin sensitivity; therefore, we tested the hypothesis that the combination of wine and exercise would enhance glycemic control in insulin-resistant participants. METHODS: 13 participants (10 female, 3 male; 7 with type 2 diabetes, 6 with pre-diabetes) completed four different 1-week treatment periods consisting of no alcohol and no exercise (CON), daily red wine (14 g ethanol) with dinner and no exercise (WINE), no alcohol and daily exercise (60 min at 55% heart rate reserve; EX), or daily wine with dinner and daily exercise (WINE + EX). During the last three days of each treatment period, each participant wore a continuous glucose monitor to record blood glucose data. RESULTS: Average blood glucose levels over each 3-day period were 7.5 ± 0.4, 7.3 ± 0.3, 7.0 ± 0.4, 7.0 ± 0.4 mmol/l for CON, WINE, EX, and WINE + EX treatments, respectively. Exercise lowered average glucose level (p = 0.04), but wine had no effect. The percentage of time with blood glucose higher than 7.2 mmol/l was 49 ± 9.2% for CON, 45 ± 8.4% for WINE, 34 ± 7.7% for EX, and 38 ± 8.2% for WINE + EX, indicating a significant effect for exercise (p = 0.016). Average overnight glucose (12:00AM-5:00AM) was measured at 7.4 ± 0.4, 7.0 ± 0.3, 7.2 ± 0.3, 6.7 ± 0.4 mmol/l for CON, WINE, EX, and WINE + EX treatments, respectively. Neither exercise nor wine had a significant effect on average overnight glucose level. CONCLUSIONS: These results suggest that one week of exercise lowers both average blood glucose levels and the fraction of time spent above 7.2 mmol/l in this group of insulin-resistant participants. There was no significant effect on average overnight glucose. Daily wine consumption, in the absence of daily exercise, did not affect glycemic control.

P434: EXPLORING OSTEOARTHRITIS PREVALENCE DISPARITIES: A COMPARATIVE ANALYSIS OF VETERANS AND NON-VETERANS IN THE UNITED STATES MILITARY

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Injuries within the military pose significant challenges to national security, with arthritis emerging as a major health concern among active-duty personnel, often leading to premature retirement or honorable discharge. This research project aims to investigate the prevalence of osteoarthritis among veterans compared to non-veterans across all states. Utilizing data from the CDC, age-adjusted arthritis prevalence rates in men were analyzed for both veteran and non-veteran populations. Results reveal a higher prevalence of arthritis among veterans compared to non-veterans, with the difference in median values statistically significant (P < 0.001). The findings underscore the importance of addressing arthritis within the military community, as its impact extends beyond individual health concerns to national security, this is an area of grave concern. Introducing programs that would assist rehabilitation could potentially prevent the progress of osteoarthritis in our military personnel. Physical therapists can have an impactful role with osteoarthritis progression within the military.

P435: DYNAMIC SCAPULAR KINEMATIC ADAPTATION AFTER REVERSE TOTAL SHOULDER ARTHOPLASTY

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Introduction: The reverse total shoulder introduces a new force coupling mechanism that alters the mechanical load, making it challenging to develop a definitive conclusion about multiplanar dynamic scapular positioning solely based on observational analysis. This study aimed to determine if using micro inertial measurement unit sensors to evaluate three-dimensional multiplanar scapular motion can offer more definitive and precise criteria to understand the influence of scapular kinematics of reverse total shoulder arthroplasty. **Methods:** Twelve patients (7 females, 5 males; mean age 68 ±3.74 years) met inclusion criteria and were preoperatively identified candidates for reverse shoulder arthroplasty. Kinematics studies were performed preoperatively and postoperatively using the Alyve system (Carpi, Italy) on the involved and uninvolved shoulder as a comparison immediately postoperatively, at three and six months. Preop and postop American Shoulder and Elbow Surgeons (ASES) scores (Minimally Clinically Important Difference=12) and range-of-motion outcome measures were obtained each time. Scapulohumeral rhythm (SHR) was assessed via quantitative measures of the scapula using the arm-trunk angle (H) and the angle of scapular upward rotation (S) using the following formula: SHR=(H-S)/S assessed via the Alyve system. **Results:** A two-tailed paired sample *t*-test revealed a statistically significant difference between the mean preoperative ASES scores (36.16) and six-month postoperative ASES score (76.44) (t(11)=-9.11, p<.001). A two-tailed paired sample t-test revealed a statically significant mean difference in the scapular tilt between the surgical and contralateral shoulder at three months postoperatively (8.86(0.91,16.82), p<.05). **Conclusion:** The findings suggest that postoperative changes in scapular kinematics following a rTSA positively impact shoulder function and patient-reported outcome measures. Micro inertial measurement units effectively assess SHR in patients undergoing a reverse total shoulder. By addressing SHR, clinicians can improve patient care and enhance the long-term success and patient satisfaction of undergoing reverse total shoulder arthroplasty.

P436: VARIABILITY IN PHYSICAL THERAPY PROTOCOLS FOLLOWING HIP ARTHROSCOPY

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INTRODUCTION: Hip arthroscopy remains one of the fastest-growing procedures in orthopaedic surgery with an 85% increase in procedure frequency from 2011 to 2018. There is agreement on the need for physical therapy following hip arthroscopy and a strong literature base on various modalities that can be implemented to aid recovery. Yet, little continuity exists amongst institutions on rehabilitation prescriptions. This study aims to identify common trends and the vast variability in publicly available physical therapy protocols following hip arthroscopy.**METHODS:** Inclusion in protocol collection was based on the 175 Accreditation Council for Graduate Medical Education accredited orthopaedic surgery programs and their affiliated surgeons. Rehabilitation protocols were collected utilizing a web-based search engine (Google.com) using the input "[Insert Program Name] hip arthroscopy rehabilitation protocol." Each protocol was analyzed for variability in brace utilization, weight-bearing restrictions, range of motion restrictions, exercise implementation, and duration for each phase and modality of rehabilitation.**RESULTS:** Of the 175 programs, only 36 unique rehabilitation protocols were publicly available from 41 programs (23.4%). Thirteen (36.1%) protocols required brace usage with an average duration of 3.2 weeks. Weight-bearing restrictions had the largest variability ranging from full body weight to just 20 pounds of pressure. Range of motion restrictions were inconsistent among the 36 protocols with varying views on duration and degree of range of motion restriction for various hip rotations. Exercise implementation varied from phase to phase of recovery with little agreement between protocols. Variability in time to return to various levels of activity also existed among the protocols analyzed.**CONCLUSION:** Publicly available physical therapy protocols following hip arthroscopy are scarce in the public domain and are highly variable. Most notably, variations exist in brace utilization, weight-bearing restrictions, and exercise utilization and progression. Future research should focus on discerning the most effective physical therapy protocol following hip arthroscopy

P437: SAFETY OF PORTABLE BODY WEIGHT SUPPORT TREADMILL TECHNOLOGY

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BACKGROUND: As our population ages, more preventative health modalities will be needed. Portable body weight support (pBWS) systems are low cost, accessible tools that allow users to reduce effective body weight. These tools could be particularly useful in rural

communities such as Appalachia. pBWS could be a potentially potent tool for rehabilitation or exercising with chronic conditions such as arthritis. The purpose of this study was to determine the safety of a novel pBWS technology. **METHODS:** Ten participants who were 55 years old or older were recruited for this study. Each participant completed two treadmill walking test conditions at a self-selected pace. One test utilized the pBWS while the other was without support. Heart rate and steady state walking economy were measured for each condition to assess physical exertion. A visual analog scale was used to determine pain, while the Borg Scale was used for perceived exertion. **RESULTS:** No significant differences were found between trials for any measure. Anecdotally, subjects reported comfort and enthusiasm about using the pBWS. All participants reported low pain at baseline. **CONCLUSIONS:** This new form of BWS system had no adverse effects on subjects and should be considered safe for healthy individuals. Future research should consider special populations, as we suspect the relative health of our participants prevented us from detecting changes in walking economy, pain, and exertion.
FUNDING: Appalachian College Association's Ledford Scholar Program

P438: THE EFFECT OF TEAM COMPETITION LEVEL ON YOUTH FEMALE SOCCER PLAYERS' TRAINING ACTIVITY AND RESPONSE

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BACKGROUND: Developing soccer players are frequently assessed and selected for different competitive-level club teams. The main purpose of this study was to determine whether the physical training demands of youth female soccer players differ based on team standard level of competition. A secondary objective was to substantiate whether differences in the physical team-based training activity between advanced and competitive-level female soccer players persist across multiple sessions and remain consistent during a phase of a competitive season. METHODS: This study utilized a repeated-measures design, with Advanced and Competitive-level female soccer players aged 15-17 years participating in three trials of the same team-based soccer-specific training session, separated by 7-days, over a three-consecutive week period. The experimental training session was designed to replicate team-based training in soccer and filmed using a Veo Sports Camera. Polar® Pro Sensors (GPS, accelerometry and heart rate) were worn across players' chests to measure distance covered, intensity of activity, and heart rate response during soccer training. External (total distance covered, number of acceleration & deceleration, and sprinting actions) and internal (%HRmax) load markers of training demand were compared by time, standard of competition, tactical playing position and training activity type. RESULTS: Detection of significant team standard of play differences in training activity and skill performance were found. The advanced female players covered a greater total distance at high intensity in training sessions 1 (964.58 ± 318.86 vs. 485.90 ± 242. 67 m) and 3 (690.58 ± 252.68 vs. 446.90 ± 187.34m), scored more total goals (1.11 ± .40), completed more dribbles (2.30 ± .65), and tackles (1.02 ± .41) than competitive-level players over 3 weeks of team practice. CONCLUSIONS: Advanced-level female soccer players perform a greater volume of physical work at high intensity and maintain superior technical skill performance over series of team-based practice sessions compared to age-matched competitive players. These findings should be considered in female soccer talent identification, training and developmental processes.

P439: TEST-RETEST RELIABILITY OF THE GAS EXCHANGE THRESHOLD AND RESPIRATORY COMPENSATION POINT AND ASSOCIATED HEART RATES

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BACKGROUND: To improve cardiorespiratory fitness, exercise prescription is often based on heart rate (HR) or oxygen consumption rate (VO_{2max}). The gas exchange threshold (GET) and respiratory compensation point (RCP) from a graded exercise test (GXT) have been used to examine the onset of physiological fatigue and predict endurance exercise performance. Therefore, it is important to consider the HR associated with the GET and RCP. The purpose of this study was to examine the reliability of the GET and RCP (expressed as a VO_2) as well as the HR associated with these thresholds. **METHODS:** Nine females (mean±SD, age = 22±2 years, height = 167.2±5.5 cm, body mass = 58.26±7.35 kg, VO_{2max} = 39.69±7.92 mL·kg^{-1}·min^{-1}) performed two GXTs to determine the GET and RCP. Each GXT started at 50 W, increasing 30 W every 2 min until volitional exhaustion or when subjects could no longer maintain a cadence of 70 rev·min^{-1}. Using visual inspection, the GET and RCP were determined as the point of departure from the linearity of the VCO_2 versus VO_2 and V_E versus VCO_2 relationships, respectively. The HRs associated with the VO_2 value corresponding to the GET (HR_{GET}) and RCP (HR_{RCP}) were determined using linear regression. Analyses consisted of paired samples t-tests ($p \leq 0.05$) to examine the test 1 and test 2 mean GET, RCP, HR_{GET}, and HR_{RCP} values, intra-class correlation coefficients ($ICC_{2,1}$), standard errors of the measurement (SEM), minimal differences (MD), and coefficients of variation (CoV). **RESULTS:** There were no significant differences between test 1 and test 2 ($p=0.20$, $p=0.07$, $p=0.08$, $p=0.06$) for HR_{GET}, HR_{RCP}, GET, or RCP, respectively. The HR_{GET} (ICC = 0.391, SEM = 6.8 b·min^{-1}, MD = 18.8 b·min^{-1}, CoV = 3.9%) demonstrated "poor" reliability. The HR_{RCP} (ICC = 0.834, SEM = 3.4 b·min^{-1}, MD = 9.5 b·min^{-1}, CoV = 2.2%), GET (ICC = 0.848, SEM = 1.649 mL·kg^{-1}·min^{-1}, MD = 5.536 mL·kg^{-1}·min^{-1}, CoV = 6.9%), and RCP (ICC = 0.959, SEM = 1.259 mL·kg^{-1}·min^{-1}, MD = 3.491 mL·kg^{-1}·min^{-1}, CoV = 3.6%) demonstrated "excellent" reliability. **CONCLUSIONS:** The present study indicated no systematic error and excellent reliability for the HR_{RCP}, GET, and RCP. Although there was no systematic error, caution may be warranted when using the HR_{GET} to prescribe or monitor exercise training due to its poor test-retest reliability.

P440: FATIGUABILITY IN WOMEN'S COLLEGIATE ATHLETICS

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BACKGROUND: In recent years, development of technology such as wearable devices have led to more objective assessments of workload and fatigue, predominately via heart rate variability (HRV)-driven markers. There are also subjective measures of fatigue assessment commonly used in high-performance training settings, such as rating of perceived exertion (RPE) scales. Previous research has shown that objective and subjective metrics do not measure identical but rather complementary aspects of fatigue. This study will examine the relationship between perceived workload and workload measured by wearable devices in collegiate athletes. This information will ideally help in understanding how to better interpret data from wearable devices and inform behavior modification in the context of training. METHODS: Participants will be asked to continuously wear a Whoop activity monitor for a two-week period of data monitoring. Daily RPE documentation will be recorded within 30 minutes of completing a training session and prior to viewing Whoop data for the corresponding two-week period. Participants will complete a brief questionnaire battery prior to data collection during Visit 1 and post-data-collection during Visit 2. Whoop exports will be obtained from participants during Visit 2 and RPE data will be obtained directly from University athletics. RESULTS: The results are expected by Spring, 2025. CONCLUSIONS: The results of this study will expand the data base to inform behavior modification by identifying predictors of differences in workload as rated by HRV-driven metrics and RPE data.

P441: METABOLIC ASSESSMENT DURING A 6-MILE RUCK MARCH

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Background: Ruck march training is perhaps the most used marker for tactical physical preparation requiring individuals to carry loads of equipment over large distances. While changes in running mechanics and well-established benchmark times to complete rucks at various distances have been determined, little is known about the metabolic demands required to achieve these ruck marches. Therefore, our aim in this case series is to delineate the metabolic demands of performing a loaded 6-mile ruck.**Methods:** Five (5) cadets from the University of North Georgia's Boars Head Brigade were the subjects and consisted of 4 males and 1 female who had mean ages of 20.2 ± .6 years and a mean starting body weight of 178.6 ± 30.5 pounds. Metabolic data was collected using the CosMed K5 Metabolic Analyzer via breathe-by-breathe analysis. Each cadet completed the 6-mile Ruck March wearing full military gear including helmet, ruck (minimum of 35 lbs, rifle (6 lbs) and flack vest (8 lbs). The additional load was approximately 55lbs. **Results:** Collected data was partitioned into three equal 2 mile segments, creating data tertiles. Comparison is between each of these time segments. From the CosMed Metabolic

Analyzer, observed VO2 (mls/kg/min), Heart Rate and Ventilation Threshold were consistent throughout the 6-mile Ruck March. In segment 1, VO2 (mls/kg/min) averaged 24.91 mls/kg/min, segment 2 25.44, segment 3 26.19 with a percent change of 2.11% between segments 1 and 2, 5.16% between segments 1 and 3 and 2.98% between segments 2 and 3 respectively. Heart Rate (HR) averaged 161.35 in segment 1, 163.04 in segment 2 and 160.03 in segment 3. HR percent change between segments 1 and 2 was 1.05%, between segments 1 and 3 a -0.82% difference, and between segments 2 and 3 an -1.85% difference. VT (L/min) averaged 1.8 in segment 1, 1.57 in segment 2 and 1.56 in segment 3. Comparison from segment 1 to 2 displayed a -12.81% difference, from segment 1 to 3 a -13.19% difference and between segments 2 and 3 a -0.44% difference.**Conclusion:** Based on these results, we can conclude that oxygen consumption averaged between 24.91 to 26.10 mls/kg/min for the 6-mile RM and remained very consistent throughout the entire 6-mile RM. HR averaged between 161.35 to 160.03 for the 6-mile RM, while VT averaged between 1.80 to 1.56 L/min.

P442: DIFFERENCES IN COUNTERMOVEMENT JUMP DERIVED NEUROMUSCULAR PERFORMANCE IN FEMALE NCAA DIVISION III VOLLEYBALL PLAYERS

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BACKGROUND: Several studies from our laboratory demonstrated that NCAA Division III soccer players underperform anaerobically at the beginning of the playing season. Further examination of the data shows a large variability in performance measures between players. Such data has not been examined in NCAA Division III women's volleyball players. Therefore, this study aimed to utilize countermovement jump (CMJ) to provide insight into neuromuscular function and compare high and low jump height performance in this population. METHODS: Seventeen members of a NCAA Division III women's volleyball team (mean ± SD): age (19 ± 1.0 yrs); body weight (70.82 ± 13.07 kg); height (1.70 ± 7.97 m); BMI (24.46 ± 4.64 $kg \cdot m^{-2}$) volunteered to participate in this study. CMJ neuromuscular performance testing included jump height, peak eccentric and concentric force, peak eccentric and concentric power, and eccentric and concentric impulse. All performance testing occurred before the start of the regular season. A median split divided the athletes into high (HP) and low (LP) performing groups based on CMJ heights. RESULTS: Significant and large effect size differences were observed between the groups for jump height (HP: 31.89 ± 1.42; LP: 24.00 ± 2.35 cm, $p < 0.01$, $d = -2.43$), peak eccentric force (HP: 24.07 ± 2.33; LP: 20.63 ± 2.07 $W \cdot kg^{-1}$, $p < 0.01$, $d = -1.56$), peak concentric force (HP: 24.11 ± 2.07; LP: 20.66 ± 2.03 $W \cdot kg^{-1}$, $p < 0.01$, $d = -1.68$), peak eccentric power (HP: 18.21 ± 4.07; LP: 13.22 ± 2.75 $W \cdot kg^{-1}$, $p < 0.01$, $d = -1.45$), peak concentric power (HP: 48.87 ± 4.26; LP: 39.16 ± 3.27 $W \cdot kg^{-1}$, $p < 0.01$, $d = -2.58$). Peak eccentric and concentric impulses were not significantly different ($p > 0.05$) and displayed small and median effect sizes (d), respectively, and between the groups. CONCLUSIONS: The results of the study suggest that differences in jump height are related to the eccentric and concentric phases of the performance.

P443: INTER-RATER RELIABILITY OF THE MODIFIED FUNCTIONAL BALANCE TEST FOR FIREFIGHTERS

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BACKGROUND: Firefighting is a dangerous occupation as more than 60,000 injuries are incurred annually by United States fire personnel. Most of these injuries are related to slip/trip/fall mechanisms on the fireground and incur substantial direct and indirect fiscal costs. The functional balance test is used to evaluate firefighters' balance in an occupationally relevant manner and has been recently modified. However, there is a lack of research on the interrater reliability of this assessment, which may support its utilization in fire service and research settings. Therefore, the purpose of this study was to evaluate the interrater reliability of the modified functional balance test (mFBT). METHODS: 18 male career firefighters (Age: 38.9±7.8 yr; Height: 179.1±5.4 cm; Body mass: 102.1±17.4 kg; BMI: 31.8±5.1 kg/m2; Fat: 24.6±6.9%) completed two familiarization sessions before data collection. Then, six trials of the mFBT were performed while wearing full personal protective equipment and carrying equipment. The final three trials were used for data analysis. To complete the mFBT the firefighter walked on a 3.7 m plank while stepping over and bending under obstacles of standardized heights as fast as possible. Summation of completion time and technical errors produced a Performance Index (PI). Two observers scored the mFBT time and identified major (2 s penalty) and minor (1 s penalty) errors via two video recordings. Intraclass correlation coefficients (ICC[95% CI]) and difference scores (absolute and relative comparisons) were used to evaluate interrater reliability and agreement, respectively. RESULTS: The interrater reliability for the mFBT time was almost perfect (ICC=0.999 [0.997-1.0]) and displayed strong agreement (Diff=0.09±0.18 s; 100.7±1.4%). Likewise, the interrater reliability for the PI was almost perfect (ICC=0.992 [0.976-0.997]) and reflected strong agreement (Diff=0.26±0.50 s; 102.1±4.6%). The interrater reliability and % agreement across trials was ICC=0.933[0.819-0.975] and 87% agreement for minor errors and ICC=1.000 and 100% agreement for major errors, respectively. CONCLUSIONS: These findings indicate that the mFBT yields almost perfect interrater reliability for time and PI outcomes and strong agreement of errors when using video analysis.

P444: CONSENSUS BETWEEN OSMOLARITY AND SPECIFIC GRAVITY IN CAREER FIREFIGHTERS

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BACKGROUND: Firefighters (FFs) are exposed to heat stress and physically demanding tasks, making hydration status a critical performance and safety factor. Although saliva osmolarity (Sosm) and urine specific gravity (USG) are the standard measures of hydration level, limited research exists on the relationship between the two metrics. Thus, this study examined the relationship between Sosm and USG in career FFs. METHODS: Sosm and specific gravity data points were extracted from an annual health and fitness assessment. After a 24-hour shift, a cohort of 55 career FFs (age=31.2 ± 9.6 years; experience= 8.2 ± 8.1 years) from a southeastern US fire department participated in this study. FFs reported to the university laboratory and refrained from consuming liquids ≥5 minutes prior to Sosm testing (MX3), then provided a urine sample for a USG measure (Master Refractometer by Atago). The measured hydration level was converted into hydration categories. Weighted Cohen's Kappa was calculated to estimate the agreement of the two hydration tests. RESULTS: Results from Sosm test indicated 27 (49.1%) of the FFs were well hydrated, 21 (38.1%) mildly dehydrated, 6 (10.9%) significantly dehydrated, and 1 (1.8%) seriously dehydrated; proportions for USG were 23.6% (n=13), 54.5% (n=30), 18.2% (n=10), and 3.6% (n=2), respectively. The Weighted Cohen's kappa for agreement between the two tests was 0.05 (Standard Error=0.09). CONCLUSIONS: Most subjects were mildly to seriously dehydrated according to either Sosm or USG, and results found minimal agreement between Sosm and USG. However, due to the convenience of Sosm testing, this method is recommended to gain insight into FF hydration status when compared to USG.

P445: BETWEEN-SET RECOVERY TIMES ON REACTIVE STRENGTH INDEX FROM A 10/5 REPEATED VERTICAL JUMPS TEST

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BACKGROUND: Rest intervals (RI) play an important role in program designs and athletic performance. Longer intra-set rest periods are used to emphasize the efficient use of the stretch shortening cycle (SSC) and to replenish ATP stores. The 10/5 Repeated Jumps Test (RJT) assesses rapid eccentric-concentric transitions, which play an impactful role in injury prevention and athletic ability. Previous literature has shown inconclusive results when analyzing the effects of rest on athletic performance. The purpose of this study is to compare the effects of various between-trial rest intervals on RSI during a 10/5 RJT. It is hypothesized that there will be a reduction in RSI score as the rest intervals shorten. METHODS: Participants (N = 7) were young male athletes (mean age: 21.7 ± 4.11 years). The 10/5 RJT was conducted using different RI (30s, 45s, 60s, and 90s) in a counterbalanced design. Kinetic data (vertical ground reaction force, flight time, ground contact time, jump height, RSI) was collected using a portable force platform (AccuPower 1016 x 672mm). Body mass (kg)

was recorded prior to testing. RESULTS: 30s intervals exhibited decreased RSI and prolonged ground contact times. 90s intervals demonstrated improved ground contact times and jump heights. Friedman tests showed no significant differences in RSI across RI (p = 0.31). DISCUSSION: The lack of statistical significance may be due to inconsistencies within subjects that may have been mitigated by a larger sample size. Inconsistent testing times may have affected the fatigue levels of participants. CONCLUSION: The study highlights the impact of varying RI on RSI during the 10/5 RJT in young male athletes. Although descriptive data showed trends, there were no clear statistical differences. Future research should explore additional recovery parameters and athlete-specific considerations to optimize RI for dynamic explosive assessments.

P446: THE EFFECT OF CAPSAISIN MOUTH RINSE ON REACTION TIME AND PROCESSING SPEED

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BACKGROUND: Capsaicin is the main active spice component found in chili peppers. Capsaicin has been shown to impact cognitive function in animal models. The purpose of this study is to examine the effects of a capsaicin mouth rinse on reaction time (RT) and processing speed (PS). METHODS: Men and women (18-24 years old) with no known allergy to spicy foods or current cuts/abrasions within the mouth were recruited. Participants completed a health history and informed consent. The University IRB approved the study. The study consisted of a counter balanced repeated measures design of two trials. On the first visit, participants performed a reaction time task (Dynavison) and a processing speed task (Stroop) with or without a 20 ml 0.6% capsaicin mouth rinse. Prior to each cognitive task, participants swished the capsaicin mouth rinse for 5 seconds and then spit out the fluid. Participants immediately performed the RT or PS tasks in random order. For the Stroop test of processing speed, participants viewed a computer screen with the names of colors displayed in a color not matching the word. Each participant was given the same 50 color words. Participants were scored on number of correct responses and total time to complete the 50 words. Reaction Time was assess using the Dynavision D2, a 4ft x 4ft board with 64 small buttons arranged in five concentric circles that illuminate in a randomized order. Participants pressed the lit button as quickly as possible. The computer software records the number of hits and the average time per hit to the nearest hundredth of a second. RT was measured by the number of correct hits in 60 seconds and by the time needed to hit the button once illuminated. RESULTS: For Reaction Time, participants hit 16% fewer buttons and were 18% slower in reaction time per hit; however, these changes were not significant (p>0.05). Processing speed errors did not significantly change and the time to respond to all 50 prompts increased by 10.48 seconds (11%, p>0.05). CONCLUSION: A capsaicin mouth rinse doesn't significantly reduce reaction time or processing speed in college aged adults.

P447: PREDICTION OF COUNTERMOVEMENT JUMP PERFORMANCE USING FOUR LOWER BODY EXERCISES

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BACKGROUND: Countermovement (CMJ) performance is a key component of athletic performance across many sports. An understanding of lower body exercises that correlate and possibly predict CMJ performance would be strong candidates for inclusion in a training program to optimal CMJ improvements. This study will examine four lower body movements (2 isometric, 2 dynamic) that may predict CMJ performance. METHODS: Participants will perform all exercises in one testing session. Participants must be men resistance training 4-6 days per week for the past 3 months. After a standardized warmup, participants will complete 5 exercises in randomized order with 3 minutes rest between each exercise. Maximal effort CMJ will be performed on force plates measuring peak force, peak velocity, peak power, rate of force development, and jump height. Isometric squat while standing will be performed in two 3 second maximum effort repetitions while standing on the Hawkins force plates. The isometric squat will be performed on a locked barbell set at a height resulting in 60 degrees of knee flexion. Data collected will include peak force and rate of force development. Peak force data from the isometric squat will be used to predict squat 1RM using a validated equation. Participants will perform three repetitions of a standard squat as fast as possible while lifting 53% of predicted 1RM. Data will be collected on peak force, peak velocity, peak power, and rate of force development using the GymAware linear velocity transducer. Participants will perform three maximum velocity high pull reps at 53% of calculated 1RM. The high pull involves moving loaded barbell from just below the waist to the shoulders. The load for this pull will be estimated using a validated equation. Data will be collected on peak force, peak velocity, peak power, and rate of force development. Participants will perform two 3-second-long maximum effort repetitions of the isometric mid-thigh pull with three minutes of rest in between attempts. Data will be collected on peak force, peak velocity, peak power, and rate of force development via Hawkins Dynamic force plates. ANTICIPATED RESULTS: We hypothesize that dynamic movements (squatting and high pull) at 53% 1RM will have the highest correlations with CMJ performance.

P448: RELATIONSHIP BETWEEN HEALTH-RELATED FITNESS MESAURES AND ESTIMATED VO2MAX IN YOUNG ADULTS

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BACKGROUND: Health-related fitness variables are thought to provide meaningful insight to performance metrics including aerobic capacity (VO2max). The purpose of this study was to investigate the relationship between commonly collected health-related fitness measures and estimated VO2max in young adults. METHODS: Ten participants (6 male; 4 female; aged 24 ± 3 y) underwent a test battery by a trained exercise professional to determine: Height; Weight; Body Fat Percentage (via BIA); Waist and Hip Circumference (calculated to determine Waist-Hip Ratio); Summated Maximal Hand Grip Strength; Isometric Mid-Thigh Pull; and Queens College Step Test to estimate VO2max. Pearson's product moment correlations were used to investigate the relationships between each variable and estimated VO2max. Data are presented as mean ± standard deviation, and an alpha ≤ 0.05 was utilized. RESULTS: None of the measured health-related fitness variables showed a significant correlation (p > 0.05) with estimated VO2max (44.0 ± 7.3 ml/kg/min). Each variable's correlation with estimated VO2max was trivial to small: Height (174.8 ± 9.6 cm; p = 0.76, r = -0.11); Weight (84.9 ± 18.7 kg; p = 0.81, r = -0.09); Body Fat (26.7 ± 4.8%; p = 0.99, r = -0.01); Waist (85 ± 11 cm; p = 0.99, r = 0.01); Hip (104 ± 8 cm; p = 0.67, r = -0.16); Waist-Hip Ratio (0.82 ± 0.06; p = 0.62, r = 0.19); Summated Grip (91 ± 31 kg; p = 0.95, r = -0.03); and Isometric Mid-Thigh (167 ± 47 kg; p = 0.85, r = -0.08). Similar trends exist when separated by gender, though sample size limitations exist. CONCLUSION: These findings suggest that in a college-aged, seemingly healthy population, commonly measured health-related fitness components may not be correlated with estimated VO2max. The lack of significant correlation between body composition values and estimated VO2max is of particular note due to established research suggesting a strong link between these variables.

P449: DIFFERENCES BETWEEN PERCEIVED AND RECOMMENDEDNUTRITIONAL NEEDS IN NCAA DIVISION 1 FEMALE ATHLETES

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Background: Nutritional intake can greatly impact an athlete's ability to adequately perform the necessary demands of their sport. However, previous literature has demonstrated many athletes may lack the nutritional knowledge necessary to follow the recommended nutritional guidelines for their level of activity. Additionally, female athletes display an increased risk for nutritional deficiencies. Thus, the purpose of this investigation was to assess the differences between perceived and recommended nutritional needs in NCAA Division 1 female soccer and volleyball athletes. Methods: NCAA Division 1 female soccer (n=24; 19.2±1.2yrs; SO) and volleyball (n=19; 19.8±1.4yrs; VB) athletes completed a survey assessing their perception regarding recommended daily intakes for total kcals, protein (PRO), carbohydrates (CHO), and fat. These perceived needs were then compared to the recommended guidelines set forth by the American College of Sports Medicine (ACSM) and the International Society of Sports Nutrition (ISSN) for low, medium, and high levels of daily activity. A Sport × Intake repeated measures ANOVA was used to assess differences between perceived and recommended needs and if this varied by sport. Significance was accepted at p≤0.05. Results: No differences were noted between sports for perceived needs for any

metric (ps >0.257). For both sports, significant differences were noted for total kcal intake at medium (SO: 2841±292 kcals/day, p=0.015; VB 3193±427 kcals/day, p<0.001) and high activity levels (SO: 3788±389 kcals/day, p<0.001; VB 4257±570 kcals/day, p<0.001) when compared to perceived needs (SO: 1917±1447 kcals/day; VB 1545±899 kcals/day). No interactions or main effects of sport were present for PRO and FAT (ps>0.139). Perceived needs were significantly lower than recommendations for CHO at high activity levels (Perceived: 297±483 g/day; High: 599±79.1 g/day, p<0.001). Conclusions: These data suggest that NCAA Division 1 female soccer and volleyball athletes perceive their daily nutritional intake needs to be in line with those who undergo low levels of activity on a daily basis as recommended by ACSM and ISSN. This difference primarily extends to overall kcal and CHO intake but not PRO or FAT. Additionally, these perceptions do not appear to be impacted by the chosen sport of the athlete.

P450: RELATIONSHIP BETWEEN POST-EXERCISE HEART RATE AND HEART RATE RECOVERY ON ESTIMATED VO2MAX IN YOUNG ADULTS

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BACKGROUND: Post-exercise heart rate recovery (HRR) is related to aerobic fitness and relevant in exercise prescription. The purpose of this study was to investigate the relationship between post-exercise HR and short-term HRR intervals, following the completion of a validated aerobic step test in young adults. **METHODS:** Ten (4 female, 6 male) participants (age 24 ± 3 yr) completed the Queens College Step Test to estimate VO2max. Following completion of the test, HR was measured at the 5 (HR_5), 10 (HR_{10}), 15 (HR_{15}), and 20 (HR_{20}) second marks, in accordance to test protocol. Additionally, the 10 (HRR_{10}), 15 (HRR_{15}), and 20 (HRR_{20}) second HR were subtracted from the initial 5 second HR value to create HRR score for each timepoint. Pearson's product moment correlations were used to investigate the relationship between variables of interest and estimated VO_{2max}. A *p*-value of ≤ 0.05 was used to determine the significance of any relationship, and data are presented as mean ± standard deviation. **RESULTS:** A significant, positive, moderate correlation was found between HRR_{20} (11.8 ± 6.5bpm) and estimated VO2max (44.0 ± 7.3 ml/kg/min; p = 0.04, r = 0.67). All other variables revealed non-significant, weak-to-moderate correlations to estimated VO_{2max}: HR_5 (157 ± 21 bpm; p = 0.17, r = -0.48); HR_{10} (155 ± 22 bpm; p = 0.17, r = -0.48); HR_{15} (150 ± 23 bpm; p = 0.10, r = -0.56); HR_{20} (146 ± 24 bpm; p = 0.08, r = -0.59); HRR_{10} (3 ± 3 bpm; p = 0.59, r = 0.20); and HRR_{15} (7 ± 5 bpm; p = 0.15, r = 0.50). Additional significant relationships existed when separated by sex, though small sample sizes limit the importance of these comparisons. **CONCLUSION:** Higher HRR is correlated to higher estimated VO_{2max} scores in this sample of young adults. However, the relationship is weaker during the first 5-15 s following cessation of exercise when compared to the 20-s timepoint, demonstrating that short-term HRR dynamics - immediately following exercise - warrants further investigation.

P451: COMPARISON BETWEEN TWO AEROBIC CAPACITY TESTS ON VO_2MAX AND VENTILATORY THRESHOLD IN ULTRAMARATHON RUNNERS

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Ultramarathons consist of any distance greater than the standard marathon distance (26.2 miles or 46 kilometers) and participation in these unique events has increased since the late 20th century. Although the popularity of ultramarathons has increased, a gold standard for aerobic capacity testing for these very special athletes has been rather challenging to establish. Therefore, the purpose of this study was to compare two different aerobic capacity tests focusing on VO_2max and Ventilatory Threshold (VT) in ultramarathon runners. Twenty-three ultramarathon runners were recruited for the study (31.4 yrs $\pm$ 9.2 yrs, 173.2 cm $\pm$ 8.0 cm, 70.5 kg $\pm$ 12.7 kg, 17.9 %BF $\pm$ 6.9 %BF), yet one participant was dropped from the study due to inability to complete the necessary protocols. Participants reported to the lab twice, 72-hours apart, and completed two separate aerobic capacity tests (Costill/Fox-Fast or Bruce Protocol) in a counterbalanced order. VO_2max, VT, VE, RPE, TTE, and RER were collected and peak values were analyzed using SPSS. An independent paired samples t-test was performed, and significance was set at $p \leq 0.05$. The results of the study were not statistically significant ($p \leq .526$) although VO_2max was higher in the Bruce Protocol compared to the Costill/Fox Protocol (53.8 $\pm$ 9.1 ml/kg/min) vs 52.0 $\pm$ 9.3 ml/kg/min). Although the results of the study were not significant, this can potentially be contributed to the level of competition of the participants, as some participants would not be classified as elite ultramarathon runners. However, the results revealed a trend that twenty out of twenty-three participants performed better on the Bruce Protocol than the Costill/Fox-Protocol regarding VO_2max. Future research should evaluate the aerobic capacity of elite ultramarathon runners, using various protocols, which may assist in determining which protocol is best for evaluating an ultramarathon runner's aerobic and even racing performance.

P452: A CHANGE IN MEASURED FITNESS & POSTURE IN DPT STUDENTS

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BACKGROUND: This study aimed to assess students' physical fitness change throughout Doctor of Physical Therapy school. **METHODS:** A total of 14 volunteer DPT students from the class of 2025 between 18 and 40 years of age (mass = 84.88 kg, sd = 28.61 kg; height = 1.703 m, sd = 0.10 m) came into the lab on three separate occasions (beginning of the first semester (BY1), end of the first year(EY1) and the end of the second year which was the end of didactic work(EY2)). The following tests were completed: handgrip strength using a handgrip dynamometer, vertical jump height using a Just Jump System ® switch mat, and Cardiorespiratory fitness was predicted using the YMCA 3-minute step test. Body composition was also analyzed using a BodPod®. Three one-way ANOVAs were used to estimate the influence of handgrip strength, vertical jump height, and YMCA 3-minute step test on the change in physical fitness over the three visits. **RESULTS:** There was a significant main effect of time on handgrip strength ($F_{(2, 13)}$ = 10.38, p < 0.002). Participants increased handgrip strength from BY1 (36.06 ± 9.71 kg) to EY1(40.35 ± 10.91 kg) and EY2(38.42 ± 9.32 kg). No significant differences were found between EY1 and EY2. There was a significant main effect of time on vertical jump height ($F_{(2, 13)}$ = 11.51, p < 0.0007). Participants decreased vertical jump height from BY1(18.02 ± 3.39 in) to EY1(16.72 ± 3.76 in) but increased from EY1to EY2 (17.66 ± 3.93 in). There was also a significant main effect of time on the 3-minute step test ($F_{(2, 13)}$ = 41.90, p < 0.0001). Participants decreased 3-minute step test heart rate from BY1(104.0 ± 24.41 BPM) to EY1(91.93 ± 21.15 BPM) but increased from BY1 to EY2 (135.3 ± 28.16 BPM) and from EY1to EY2. **CONCLUSION:** Mixed results were found in this study. From the beginning of the study to the end of the didactic work, forearm strength increased, lower extremity power had no change, and cardiovascular fitness decreased.

P453: COMPARING DISTAL AND PROXIMAL MUSCLE THICKNESS ULTRASOUND MEASURES FOR BICEPS BRACHII

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BACKGROUND: The biceps brachii is a commonly measured muscle to assess upper body strength and hypertrophy in both athletic and clinical settings. Muscle thickness (MT) is a viable tool to measure the biceps brachii with the use of a portable ultrasound device. However, there can be large variability with regard to the site of measurement, specifically that there can be discrepancies in the muscle thickness measurement based on where the ultrasound probe is placed. It is therefore important to determine the sensitivity of the quantitative measures based on where on the biceps brachii the scans are taken. **PURPOSE**: Scan the mid-point, 2cm proximal and 2cm and determine if significant differences exist. It was hypothesized that the middle would be significantly thicker than the proximal and distal sites. **METHODS:** Ten healthy adults (20-50 yrs) participated in the study. During testing, participants lay supine in the anatomical position. The midpoint of the muscle was calculated as the distance between the head of the humerus and the antecubital space. Without picking up the 8L ultrasound probe the researcher took a picture of the biceps brachii in B-Mode using a Logic e ultrasound (General Electric, Singapore), before taking pictures both 2cm proximally and distally of the muscle. A 1-way ANOVA was used to test for significant differences (α;=0.05) among the middle, distal, and proximal measures. **RESULTS**: There were no significant differences (p=0.99) among the middle (2.32±0.53), distal (2.33±0.61), and proximal (2.30±0.55) sites.

CONCLUSION: The MT measurements remained consistent across the length of the biceps brachii muscle. These data infers that the biceps brachii may not be overly sensitive to small measurement errors.

P454: INTRA-SET CHANGES IN SURFACE ELECTROMYOGRAPHY DUE TO HIGH OR LOW LOAD RESISTANCE EXERCISE TO FAILURE

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BACKGROUND: The purpose of this study was to examine the load-dependence of changes in surface electromyography during lower body resistance exercise taken to failure. **METHODS:** Thirty strength-trained college-aged males (n=14) and females (n=16) completed a crossover design in randomized order. EMG amplitude of the superficial quadriceps (VL, VM, RF) was recorded during the exercise bout, consisting of 3 sets of unilateral leg extensions to failure with 2 min rest at an intensity of 80 (HL) or 30% (LL) of 1RM. The first, middle and last rep of each set was selected for analysis using custom written signal processing software. Dynamic EMG amplitudes were normalized to an average reading during a warmup set at equal load. **RESULTS:** For reps completed there were no sig. 3 way interactions, but interactions for sex×set (p=.041), sex×condition (p=.036) and set×condition (p<.001) were found. Post hoc analysis showed that when collapsed across sex, reps in LL set 1 (mean, 95% CI 29.1 [27.3-31.0]) were higher (ps<.001) than all other sets; reps in LL set 2 were higher than LL set 3 (p=.0253, 22.7 [20.9-24.6]) vs. 19.3 [17.5-21.3]). However, reps in HL did not significantly decrease across set (ps>.1389, set 1: 10.6 [8.7-12.4], set 2: 8.9 [7.0-10.8], set 3: 7.8 [5.9-9.7]). When collapsed across set, reps completed in HL were similar between sexes (p=0.359), but in LL males completed more reps than females (p=.0003, 27.1 [24.9-29.3] vs. 20.1 [18.4-22.4]). Across condition, males completed sig. more reps than females in sets 1 and 2 (p<.0103, set 1: 22.1 [20.5-25.2] vs 16.8 [14.7-19.0], set 2: 18.7 [16.3-21.0] vs 13.0 [10.9-15.1]), but not set 3 (14.8 [12.5-17.2]) vs. 12.3 [10.4-14.4]). For normalized EMG amplitude, we observed a main effect for condition (p<.001): HL evoked sig. greater dynamic amplitudes than LL. Collapsed across rep, set, and sex, HL normalized amplitudes were 219% higher than those during LL (384% [357-412%] % vs 165% [137-193%]). There was no higher interaction between factors, although a trend is noted for set (p=.063) showing a 34% increase between sets 1 and 2 (261% [231-291%] vs 295% [265-326%]). **CONCLUSIONS:** Males completed more reps than females at low loads. Relative load, not fatigue, is the main driver of increased EMG amplitude across fatiguing sets. **FUNDING:** This project was funded by an SURF grant awarded to AK.

P455: EFFECTS OF THE POLYAMINE SPERMIDINE ON MARKERS OF ANABOLISM, CATABOLISM, AND CELLULAR SENESCENCE IN MUSCLE CELLS IN VITRO

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Polyamines (spermidine and spermine) are small molecules produced from the amino acid ornithine and are ubiquitously present in all cell types. Interestingly, cellular polyamine concentrations decline in an age-associated fashion, and this may mechanistically affect cellular aging given their involvement in growth/proliferation, protein synthesis, cell membrane stability, and autophagic flux. Although spermidine (SPM) is a nutraceutical promoted for its anti-aging effects, the effects of exogenously supplied polyamines on skeletal muscle outcomes are vastly underexplored. Thus, we used in vitro models to examine the effects of different SPM concentrations on myoblast proliferation (STUDY1) as well as myotube protein synthesis and protein degradation markers (STUDY2). Additionally, we performed a serum starvation experiment on myotubes to determine if SPM affected cellular outcomes (STUDY3). All studies involved low-passage C2C12 myoblasts. For STUDY1, myoblasts were seeded with growth media (GM, 10% FBS) and treated with either phosphate buffered saline (CTL) or different concentrations of SPM (0.1-100 μM) for 24 hours to examine cell counts. For STUDY2, myotubes were generated following 5-7 days of differentiation media and treated with either CTL or 1/10/50 μM SPM in DM for 24 hours. For STUDY3, differentiated myotubes were serum-starved for 24 hours while being treated with CTL or 2 μM SPM. STUDY1 indicated increased myoblast number with 0.1&1.0 μM SPM relative to CTL (p<0.05), but 10/20/50/100 μM concentrations drastically reduced cell counts relative to CTL indicating a potential cytotoxic effect. STUDY2 indicated that 24-hour 10 μM treatments increased myotube diameter relative to CTL, albeit no markers of protein turnover were significantly affected. STUDY3 indicated that serum starvation increased myotube beta-galactosidase activity (+13%, p=0.019), and 2 μM SPM during serum starvation reduced this metric (trend at p=0.079). We posit lower micromolar doses (e.g., 0.1-2.0 μM) of spermidine may enhance myoblast proliferation and positively impact cellular senescence in myotubes. Additionally, slightly higher doses (e.g., 10 μM) may promote anabolism in myotubes. However, these findings as well as need to be translated using in vivo models to draw more definitive conclusions.

P456: COMPARISON OF WRIST-WORN DEVICES IN ESTIMATING ENERGY EXPENDITURE IN FEMALE ATHLETES

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Background: Wearable technology, especially smart watches, is currently very popular. Smart watches are a convenient and accessible way for people to monitor personal health data. Two common brands are FitBit and Apple Watch. Many people base health decisions on data from these devices, so it is important to understand the accuracy of each. Previous research from our group using the FitBit Versa 2 and Apple Watch Series 3 indicated that they measure heart rate accurately compared to 12-lead ECG monitoring. However, both watches yielded large error rates for estimated energy expenditure (EE) compared to gold-standard open-circuit spirometry, in a sample of young, healthy men. Additionally, our previous findings suggested that hand-dominance and modality (e.g., treadmill versus stationary bike) of exercise influences EE estimation accuracy. The purpose of this study is to determine whether these same inaccuracies are observed in a sample of females. **Methods:** Twelve to fifteen female college athletes will be recruited for this study. Participants will wear a FitBit Versa 2 and Apple Watch series 3 on each wrist and be fitted with a 12-lead ECG monitoring system and face mask for open circuit spirometry. Next, they will perform subsequent graded exercise tests on a treadmill and a stationary bike. Exercise heart rate and EE data will be compared to data gathered from the ECG system and metabolic cart, respectively. Repeated measures ANOVA will determine differences between measurement tool across the three graded exercise test stages. **Anticipated Results:** We anticipate seeing similar amounts of error in EE, but similar accuracy in heart rate. Our next steps would be to combine data and determine if there are any sex differences.

P457: THE IMPACT OF INTRAWORKOUT CARBOHYDRATE CONSUMPTION ON RESISTANCE TRAINING PERFORMANCE IN RESISTANCE TRAINED ADULTS

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Background: Consuming carbohydrate (CHO) throughout a workout is a well-established practice throughout endurance sports. However, despite the growing popularity of intraworkout CHO consumption in strength sports and resistance training (RT), there is a paucity of literature to examine if such methods may benefit RT in the same manner. The purpose of this study was to examine the impact of consuming CHO during an RT workout on measures of muscular performance. **Methods:** 10 resistance trained (7±7.3yrs) males (n=5, 28.6±8.4yrs) and females (n=5, 20.6±1.5yrs) completed 4 laboratory visits. On visit 1, a 1RM was established for barbell bench press, dumbbell incline row, dumbbell shoulder press, and lat pull down. During visits 2-4, participants completed a resistance training workout consisting of 3 sets to failure at 75% of the previously determined 1RM while consuming 28oz of either a CHO beverage providing 50g of CHO, a flavor matched placebo (PLA), or water (WAT). Visits 2-4 were completed in a randomized crossover fashion. Total repetitions for each exercise, set, and throughout the full session were recorded. A Condition:Set repeated measures (RM) ANOVA was used to examine differences in repetitions across sets for each exercise. A one-way RMANOVA was utilized to assess variations in total repetitions for each exercise and the full session between conditions. Significance was accepted at p≤.05. **Results:** No Condition:Set interactions (*ps*>.583) or main effects of condition (*ps*>.398) were found for any variable. Main effects of set were found for all exercises (*ps*<.001). Furthermore, no significant differences were detected across conditions for any exercise or all repetitions completed throughout the session (*ps*>.140). **Conclusions:** These data suggest that, in a

laboratory setting, consuming 50g of CHO throughout an upper body resistance training workout does not impact the total volume that is able to be completed when compared to a flavor matched placebo or water.

P458: DIFFERENCES IN ANAEROBIC PERFORMANCE AND RPE BETWEEN EUMENORRHEIC AND HORMONAL CONTRACEPTION USERS

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BACKGROUND: In eumenorrheic (EUM) women, higher estrogen may enhance fatigue resistance during high-intensity exercise bouts, while higher progesterone may increase ratings of perceived exertion (RPE). Oral contraceptives (OC) eliminate endogenous hormonal fluctuations, while hormonal intrauterine devices (IUD) deliver localized hormones that do not suppress them. The stable, low-hormone profile with OC may benefit anaerobic performance and RPE, and IUD may exhibit similar outcomes as EUM. To date, the impact of hormonal environment on anaerobic performance remains inconclusive. Therefore, this study aimed to evaluate differences in anaerobic performance and RPE between low (LHP) and high hormone phases (HHP) in EUM, OC, and IUD. METHODS: Healthy, recreationally active women (EUM: n=6; IUD: n=3; OC: n=10) (Mean±SD; Age: 24.3±3.8 yrs; %BF: 23.4±2.5 %) performed a repeated sprint test (10 × [6s sprint: 30s rest]) on a cycle ergometer during their LHP (1-7 days post menstruation/placebo pill) and HHP (5-9 days post ovulation/active pill). At-home urine hormone tests were completed daily to determine hormone phase and testing days. Fatigue index (FI (%)) was recorded and RPE, peak power (PP (watts (W)), average power (AP (W)), and power drop (PD (W)) were averaged over the 10 sprints. Effects of group and hormonal phase on anaerobic performance outcomes were evaluated using two-way repeated measures ANOVA. RESULTS: There were no significant group × phase interaction effects for any outcome (p=0.454-0.991). When evaluating main group effects, there were no significant differences between EUM, OC, and IUD for any outcome (p=0.066-0.555), but OC had higher PP (MD±SE: 112.3±45.0 W; p=0.058) and AP (101.2±41.7 W; p=0.067) compared to IUD. When evaluating main phase effects, PD was greater in the LHP (Mean±SD: 102.3±22.7 W) compared to the HHP (92.0±22.9 W) (p=0.006); no other outcomes were significantly different between LHP and HHP. CONCLUSIONS: Minimal differences in anaerobic power outcomes and RPE were observed between hormone profiles and phases. Peak power and AP may be higher in OC due to the absence of endogenous hormonal fluctuations or differences in carbohydrate utilization for high-intensity energy demands, but further investigation and/or a larger sample size is needed to confirm group differences.

P459: EFFECT OF HIGH-INTENSITY FUNCTIONAL TRAINING WITH A RESPIRATORY MUSCLE TRAINING DEVICE ON HEART RATE RECOVERY

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Respiratory muscle fatigue can limit high-intensity performance. Respiratory muscle training (RMT) devices increase breathing resistance during exercise and recovery, potentially enhancing adaptation due to additional stress. Therefore, we aimed to determine the effect of high-intensity functional training (HIFT) with an RMT device on heart rate recovery (HRR) following a maximal HIFT test. Twenty recreationally active adults (age = 22.6 ± 2.1y, BMI = 24.1 ± 3.4kg/m^2) were randomized into two groups with (RMT; M = 6, F = 4) and without (CON; M = 6, F = 4) an RMT device. Training consisted of three 30-minute HIFT sessions per week for six weeks. Each session consisted of four rounds of six HIFT exercises using a 30:30-second work-to-rest ratio, with 2.5 minutes of rest between rounds. Pre- and post-testing consisted of an 18-minute self-paced maximal HIFT bodyweight test with each round containing 10 inverted rows, 5 pushups, and 15 squats. Heart rate was monitored throughout all sessions. Training volume (TV) for weeks 1 and 6 was calculated as: (weight x total repetitions) + (distance or watts on a rower or bike, respectively). Training HRR was recorded between the third and fourth training rounds and compared between weeks 1 and 6. Following HIFT test completion, testing HRR and number of rounds completed (RC) were recorded. ANCOVAs using baseline fitness (VO_2max) as the covariate were used to assess effects of the intervention on TV, training and testing HRR, and RC ($\alpha = 0.05$). Effect sizes (Cohen's *d*) were also calculated. There was a time main effect for TV ($P = 0.002$, ES = 0.93). The RMT group exhibited a lower training HRR versus CON at weeks 1 and 6 ($P = 0.008$, ES = -0.72). There was no effect on testing HRR ($P > 0.05$, ES = 0.10), but there was a time main effect for RC ($P < 0.001$, ES = 1.14). HIFT with an RMT device increased cardiovascular strain during training compared to HIFT without compromising TV. While HIFT improved RC, the increased strain from the RMT device did not improve testing HRR. Future studies should explore the effects of RMT on aerobic performance. This project was funded by a grant from NEO-Ventures LLC. This abstract was made possible in part by Grant Number T32-GM081740 from NIH-NIGMS for GFM. Its contents are solely the responsibility of the authors and do not represent the official views of NEO-Ventures LLC nor NIGMS or NIH.

P460: OPTIMAL INTRA-COMPLEX REST INTERVALS FOR COMPLEX TRAINING TO DEVELOP POWER

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BACKGROUND: Complex training (CT) is a power development strategy used primarily by athletes. It is characterized by a heavy resistance exercise (HRE) followed by a rest period and then a biomechanically similar low-resistance exercise (LRE) performed as quickly as possible. The two exercises are known as a complex pair. The heavy load of the HRE is responsible for the post activation potentiation effect which further enhances power production during the LRE. It is believed that CT can illicit chronic adaptations that enhance an athlete's strength and power production capabilities after an extended period of exposure to the training strategy. The intra-complex rest interval (ICRI) is the length of time that one rests between the HRE and LRE. There is no clear agreement within the literature as to what the optimal ICRI time is for trained athletes, or how this could vary between muscle groups. METHODS: The study will recruit 16 male and female participants between the ages of 18-35. Each participant will complete 7 visits. Visit 1 will include health screening and a familiarization session where the subject's 5 repetition maximum (5RM) in the barbell back squat and smith machine bench press will be obtained for the HRE. Visits 2-7 will comprise of a complex training session pairing a back squat 5RM (HRE) and single vertical jump (LRE) for the lower body, and a 5RM bench press (HRE) with a smith machine ballistic barbell throw (LRE) for the upper body. The ICRI time between the HRE and LRE will be randomized between 30sec, 1, 2, 4, 6, or 8 min, with each session testing a specific ICRI time. Results will be analyzed using repeated measures ANOVA to determine the significance of differences in power production between different rest times after the HRE. ANTICIPATED RESULTS: It is hypothesized that rest times of 4 min or greater will have a greater positive impact on power production during the LRE when compared to rest times of 2 min or less. In addition, it is hypothesized that relative changes in upper body power will be lower when compared to lower body changes in power, for ICRI less than 6 minutes.

P461: COMPARISON OF COUNTERMOVEMENT JUMP PERFORMANCE IN FEMALE NCAA DIVISION I AND JUNIOR COLLEGE SOCCER

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Background:The countermovement jump (CMJ) is commonly used as an assessment of one's neuromuscular capabilities. Previous investigations have shown the CMJ can differentiate sport populations by competition level through variables such as reactive strength index modified (RSImod) and jump height (JH). As the CMJ has increased in popularity, it is possible to use normative data to differentiate levels of competition within sports. Thus, the purpose of this investigation was to explore CMJ performance across competition levels of collegiate soccer players. Methods: 31 collegiate soccer players from one NCAA Division I team (n=20) and one junior college team (n=11) participated in this investigation. Data was collected during the spring training period for both teams. Participants completed three maximal effort CMJ trials, separated by 30 seconds. All trials were performed on a portable force platform sampling at 1000 Hz. Independent sample t-tests were performed on the mean values of the three trials for each variable of interest. Results: Statistically significant differences were seen between competition levels with higher values in the NCAA group for JH (0.27 ± 0.03 cm vs 0.22 ± 0.03 cm, $p < 0.001$), RSImod (0.31

± 0.05 vs 0.26 ± 0.04, p < 0.01), and countermovement depth (CMD) (0.32 ± 0.05 cm vs 0.26 ± 0.04 cm, p < 0.01). No statistical differences were presented for time to takeoff (TTT) (881.82 ± 107.02 ms vs 856 ± 126.07 ms, p > 0.05) between groups. Conclusions: Based on the TTT being the same for both teams, there is a possibility of jump strategy differences existing among competition levels. This can be supported by the NCAA group going to a greater CMD with similar TTT. The greater RSImod seen in the NCAA is due to a greater JH, as RSImod is the ratio of JH and TTT. Thus, both JH and RSImod could be used in the talent identification process in collegiate womens soccer.

P462: COMPARING LOCALIZED AND WHOLE-BODY VIBRATION ON LOWER EXTREMITY JOINT KINEMATICS: A PILOT STUDY

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BACKGROUND: Whole-body vibration (WBV) has been utilized as a mechanism of activating proprioceptive pathways, while reestablishing neural connections to the muscle. Technological advancements of wearable, localized compression vibration sleeves (LCV) provide similar proprioceptive and neuromuscular stimulation while removing geographical barriers. Reducing joint and gait asymmetries is a leading way to help minimize injury and decrease mortality. Previous studies looked at effects of these modalities on walking speed and cadence, but not asymmetries. The purpose of this study is to determine if any effects are observed between LCV and WBV on stride length (STRL) and step length (STEP) asymmetries. **METHODS:** Twelve male and female participants (22.16±2.04 yrs, 1.73±.08 m, 74.84±11.23 kg) volunteered to take part in this pilot study and served as their own control groups. A WBV plate was tested against the LCV sleeves to determine the influence of different styles of vibration on asymmetries within joint kinematics. Vibration was implemented utilizing a 1:1 work: rest ratio for 5 trials between recorded gait cycles. A 3D motion capture system was used to obtain joint kinematics. Joint kinematics were assessed before and after each modality to determine baseline for WBV and LCV. Paired samples t-tests were conducted to examine differences between variables. **RESULTS:** A statistically significant difference was noted in between pre and post LCV for STRL and STEP (.66%±3.12% vs. -.72%±.99%, p=.05, -5.62%±10.44% vs. .94%±4.60%, p=.05), however there were no significant effects noted between pre and post WBV STRL or STEP. **CONCLUSION:** These results suggest vibration may help minimize asymmetry in stride and step length, which may support a reduction in injuries and decrease mortality. Post WBV saw a decrease in asymmetry in step length, but not in stride length. Using LCV as a modality to reduce joint asymmetries could serve as a method to prevent falls and increase neuromuscular stimulation. Further analysis is needed to continue to explore the effects of these modalities on lower extremity joint kinematics.

P501: DIETARY BERBERINE SUPPLEMENTATION IMPROVES THERMAL COMFORT AND PERCEIVED EXERTION DURING EXERTIONAL HEAT STRESS

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Purpose: Berberine is a popular over the counter medicine in China that is ingested to improve gastrointestinal function. Recently, Berberine has been shown to improve core temperature regulation in mice, but whether these benefits are extended to humans that are challenged with exercise-heat stress is currently unknown. **Methods**: Five men and two women (mean ± SD: Age 22.7 ± 3.4 years, height 173.3 ± 2 cm, mass 71.6 ± 3.1 kg, VO2max 51.4 ± 2.8 mL·kg-1·min-1, body composition 12.2 ± 2.3% body fat) ingested 1.5g of Berberine or Placebo for 7d prior to a 1hr treadmill run (60% VO_{2max}) in hot ambient conditions (35°C & 35%RH). Blood samples were collected before (Pre), immediately following (Post), 1 hour (1-Post), and 3 hours after (3-Post) exercise. Core temperature, shell temperature, heart rate (HR), expired gasses, and ratings of thermal sensation, perceived exertion, and perceived discomfort were measured throughout exercise. **Results**: Thermal sensation was lower (p=0.027) from 25 through 60 min of exercise in Berberine (12.0±3.2) as compared to Placebo (15.4±3.3). Ratings of perceived exertion (RPE) were also lower (p=0.002) from 25 through 60 min of exercise in Berberine (13.2±2.6) as compared to Placebo (15.8±2.6). Perceived discomfort also trended lower (p=0.074) in Berberine (10.7±4.6) as compared to Placebo (13.9±4.6). **Conclusion**: These data suggest 7d berberine supplementation improves thermal sensations and perceived discomfort during exertional heat stress. Improvements in circulating neurotransmitter (Serotonin, Dopamine, and Norepinephrine) concentrations may potentially explain this response, and analysis of plasma samples is currently ongoing.

P502: DIETARY BERBERINE SUPPLEMENTATION IMPROVES MEAN SKIN TEMPERATURE DURING EXERTIONAL HEAT STRESS

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Purpose: Berberine is a popular Chinese dietary supplement that has been used to regulate gut function for centuries. More recently, it has been shown to reduce core temperature elevation in mice exposed to passive heat stress. This study examined the effectiveness of 1.5 grams of dietary Berberine supplementation on core, skin, and mean body temperature during 60-minutes of treadmill exercise performed in hot, dry ambient conditions. **Methods:** Five men and two women (mean ± SD: Age 22.7 ± 3.4 years, height 173.3 ± 2 cm, mass 71.6 ± 3.1 kg, VO_{2max} 51.4 ± 2.8 mL·kg^{-1}·min^{-1}, body composition 12.2 ± 2.3% body fat) ingested 1.5g of Berberine or Placebo for 7d prior to a 1hr treadmill run (60% VO_{2max}) in hot, dry ambient conditions (35°C & 35%RH). Core temperature, shell temperature, heart rate (HR), thermal sensation, perceived discomfort, perceived exertion, and expired gasses were measured throughout exercise. Blood samples were collected before (Pre), immediately following (Post), 1 hour (1-Post), and 3 hours after (3-Post) exercise. **Results:** Berberine supplementation was not shown (p>0.05) to improve core temperature response during exercise (Berberine: 37.90 ± 0.44; Placebo: 37.96 ± 0.34). However, Berberine supplementation did contribute to a significant reduction in mean skin temperature (p<0.03) from 50-60 minutes of exercise (Berberine: 34.81 ± 1.22; Placebo: 35.12 ± 0.71). Mean body temperature also trended toward significance (p= 0.08) following Berberine supplementation from 40-55 minutes of exercise (Berberine: 37.60 ± 0.50; Placebo: 37.74 ± 0.27). **Conclusion:** These data indicate that Berberine supplementation reduces skin and possibly mean body temperatures during prolonged exercise under hot, dry conditions. These findings may have practical significance for athletes, military populations, and others who regularly perform work or exercise under similar conditions.

P503: PRELIMINARY PHYSIOLOGICAL AND PSYCHOLOGICAL CHARACTERIZATION OF CAREER FIREFIGHTERS UNDERGOING SMOKE DIVER TRAINING

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BACKGROUND: Smoke Diver training is an advanced, physically and mentally challenging course focusing on fire suppression and structure fire rescue skills for career firefighters (FF). Little is known about FFs pursuing this certification and how individual descriptors may influence physiological responses to training. This study aimed to characterize the general health of FFs undergoing a 5-day Smoke Diver course and to explore associations between health variables and stress biomarkers at rest and following a day of live drills. **METHODS:** Male FFs (N=24; M ± SD; age, 31 ± 6 y; body mass index [BMI], 29.2 ± 4.2 kg·m^{-2}) completed a survey to assess demographics, health behaviors (e.g., habitual sleep via Pittsburgh Sleep Quality Index [PSQI], physical activity [PA]), and posttraumatic stress disorder (PTSD) symptom severity (e.g., PTSD Checklist for DSM-5 [PCL-5]). In a subset of FFs (n=8; age, 33 ± 4 y; BMI, 28.1 ± 3.7 kg·m^{-2}), exploratory correlational analyses investigated associations between descriptives and stress biomarkers (white blood cells [WBC], red blood cells [RBC], hemoglobin [HGB], hematocrit [HCT]) at rest and in response to a full day of live drills (Δ, post-pre). **RESULTS:** FFs had 9 ± 5 y of service, 89.5% met federal PA guidelines (≥150 min·wk^{-1} of aerobic exercise and ≥2 days·wk^{-1} of resistance exercise), slept 6.8 ± 0.4 h per night, 74.1% slept poorly (PSQI Global Score = 5.7 ± 2.4; ≥ 5 indicates poor sleep quality), and reported low PTSD symptom severity (PCL-5 score = 5.6 ± 6.6). In our subset (n=8), higher PSQI Global Scores were associated with high WBCs at rest (r = 0.71, p = 0.05) and changes in stress biomarkers following the live drills: ΔRBC (r = -0.81, p = 0.01), ΔHGB (r = -0.76, p = 0.03), and ΔHCT (r = -0.78, p= 0.02). Higher PTSD symptom severity was also associated with high WBCs at rest (r = 0.83, p = 0.01) and physiological stress post-drills (ΔRBC, ΔHGB

and ΔHCT: r = -0.82 to -0.88, p ≤ 0.01 for all). **CONCLUSIONS:** FFs were, on average, middle-aged, overweight men, who met federal PA guidelines, experienced mild sleep dysfunction, and had low PTSD symptom severity. While a larger and more diverse sample is needed to enhance the generalizability of our results, we found that poorer sleep quality and higher PTSD symptom severity influences physiological stress in Smoke Diver trainees at rest and during live drills.

P504: THE EFFECT OF RESISTANCE TRAINING ON BDNF LEVELS AND MENTAL HEALTH

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BACKGROUND: Mental health has become a more widely recognized concern. Reports of college students being treated for anxiety and depression have been on the rise. As this issue surfaces and professionals frantically seek viable treatments, exercise has been at the forefront of their efforts. One potential mechanism that could account for these changes with exercise is Brain-Derived Neurotrophic Factor (BDNF). This protein is important for glucose regulation and energy metabolism, and has been shown to play a role in neurodegenerative diseases and mental health. Thus, the purpose of this study is to examine the effectiveness of resistance training in improving mental health in college students and whether BDNF could mediate these results. METHODS: 50 college students with mild to moderate anxiety or depression, determined by State-Trait Anxiety Inventory (STAI) and Beck Depression Inventory-II (BDI-II) will be recruited for this study. STAI and BDI-II will be completed and BDNF will be measured via blood draw at baseline. Each individual will be randomly assigned to either an intervention (resistance training) or control group. The intervention group will undergo a 3-month resistance training program where they will have 3 60-min sessions per week supervised by certified personal trainers. Each session will include a 10-min warm up, 45 minutes of resistance exercises targeting major muscle groups, and a 5-minute cool-down. The control group will maintain current lifestyle habits and are asked not to begin any new exercise programs during the study period. At the end of each month, both groups will complete STAI and BDI-II and BDNF will be measured. ANTICIPATED RESULTS: It is hypothesized that a 3-month resistance training program will have a greater positive influence on anxiety and depressive symptoms compared to those that do not participate in resistance training during that time period. BDNF will act as a mediator of these results.

P505: BODY DISSATISFACTION IS POSITIVELY ASSOCIATED WITH DISORDERED EATING BEHAVIORS IN UNDERGRADUATE STUDENTS

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BACKGROUND: Undergraduate students seeking health-related degrees may be at a higher risk of developing disordered eating behaviors compared to those majoring in non-health-related fields. Although disordered eating may also be influenced by other health-related variables such as body mass index (BMI), physical activity (PA) levels, and body/muscle dissatisfaction, no prior studies have examined the potentially synergistic relationship between these variables**. METHODS:** This study aimed to examine whether disordered eating varied as a function of academic major (health- vs non-health-related), PA (total MET-minutes per week obtained via the International Physical Activity Questionnaire - Short Form), BMI, muscle dissatisfaction (summary scores obtained via the Muscle Appearance Satisfaction Scale), body dissatisfaction (summary scores obtained via the Body Shape Questionnaire), and sex. Electronic surveys were distributed to approximately 28,000 undergraduates to assess demographic information (e.g., sex, academic major) and the aforementioned health-related variables. A blocked linear regression approach was conducted to determine the best fitting model among all independent variables (IVs). Next, significant IVs ($p<0.05$) from the blocked regression model were included as interactive effects in a linear regression model, with non-significant IVs included as covariates. **RESULTS**: The sample consisted of 186 participants (health-related majors n = 82). Preliminary results indicated that health-related major was associated with lower disordered eating scores, and greater body/muscle dissatisfaction scores were associated with higher disordered eating scores. Results from the interactive linear regression model indicated that only greater body dissatisfaction scores were associated with greater disordered eating scores ($t(175) = 6.79$, $p<0.001$). **CONCLUSIONS**: Body dissatisfaction is a significant predictor of disordered eating among undergraduate students after controlling for muscle dissatisfaction, BMI, and PA, and interactions with body dissatisfaction and academic major.

P506: ANHEDONIA-RELATED DEPRESSIVE SYMPTOMS AND PTSD SYMPTOM SEVERITY DIFFERENTIALLY INFLUENCE PHYSICAL ACTIVITY LEVELS IN TRAUMA-EXPOSED ADULTS

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BACKGROUND: Prior research has examined independent associations between posttraumatic stress disorder (PTSD), anxiety, and depressive symptoms with physical activity (PA) levels. However, examinations of specific depression and anxiety symptom dimensions (e.g., anhedonia, worry) and interactions among these psychiatric variables with PA levels are lacking. **METHODS:** Secondary data-analyses were conducted among 107 trauma-exposed adults (61% women; 54% white; mean±SD age=28±9 y) who completed the Mood and Anxiety Symptom Questionnaire - Anhedonic Depression scale, PTSD Checklist for DSM-5, Penn State Worry Questionnaire, Pittsburgh Sleep Quality Index, and International Physical Activity Questionnaire - Short Form. Interactions between anhedonia-related depressive and PTSD symptom severity (model 1) and worry and PTSD symptom severity (model 2) on PA levels were examined with separate linear mixed effects models that controlled for covariates that independently influence PA levels (i.e., age, sex, body mass index, education, race, sleep quality), with random effects by subject. **RESULTS:** Participants reported an average of 2583.54±1947.53 total MET-min/wk, and 70% of the sample met the aerobic activity component of the federal PA guidelines. For model 1, there was a significant anhedonia-related depressive symptom severity × PTSD symptom severity interaction ($t(97)=2.30$, $p=0.02$; marginal $R^2=0.48$, conditional $R^2=0.74$). Analysis of simple effects indicated that greater anhedonia-related depressive symptom severity was associated with lower PA levels among those with moderate to low PTSD symptom severity (i.e., scores ≤ sample mean of 14.47±14.02), whereas greater anhedonia-related depressive symptom severity was associated with higher PA levels among those with high PTSD symptom severity (i.e., scores > sample mean). For model 2, the worry × PTSD symptom severity interaction was non-significant ($t(97)=0.95$, $p=0.35$; marginal $R^2=0.44$, conditional $R^2=0.72$). **CONCLUSION:** These nuanced findings suggest that PA levels among trauma-exposed adults may vary as a function of anhedonia-related depressive symptom severity and PTSD symptom severity profiles (i.e., combinations of symptoms differentially influence PA levels).

P507: WHEY PROTEIN SUPPLEMENTATION DOES NOT AFFECT VASCULAR MEASURES FOLLOWING ECCENTRIC-INDUCED MUSCLE DAMAGE IN RESISTANCE-TRAINED INDIVIDUALS

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BACKGROUND: Due to a higher anti-inflammatory and antioxidant content, dairy products from pasture-raised grass-fed cows may modulate vascular tone to a greater extent compared to products from grain-fed cows. Since exercise-induced muscle damage (EIMD) can transiently disrupt vascular homeostasis, we tested the hypothesis that whey protein from pasture-raised grass-fed cows (PRWP) would enhance markers of vascular recovery compared to either conventional whey protein (CWP) or a non-protein control (NPC) following EIMD. **METHODS:** A 3-arm randomized, isocaloric placebo-controlled design was used to test 39 (26 male / 13 female) resistance-trained individuals (PRWP, n = 14; CWP, n = 12; NPC, n = 13). To induce EIMD, participants completed an eccentric barbell back squat protocol. Rested blood pressure and vascular assessments, including, augmentation index normalized to a heart rate of 75 bpm, subendocardial viability ratio, and pulse wave velocity via applanation tonometry, were performed post-EIMD (i.e., 24, 48, and 72 h into recovery). Participants consumed PRWP, CWP, or NPC three times daily throughout the recovery period. Linear mixed models with fixed factors for time, condition, and their interaction were used to determine the effect of supplementation on vascular recovery. Statistical significance was defined as a two-sided alpha of ≤ 0.05.

RESULTS: Between-condition differences in blood pressure and vascular assessments were not observed at baseline (pre-EIMD). However, a significant interaction at 48 h post-EIMD was detected such that diastolic blood pressure was elevated in the PRWP condition (PRWP, 77 ± 11 mm Hg; CWP, 66 ± 9 mm Hg; NPC, 67 ± 10 mm Hg; $P = 0.011$). Pulse wave velocity was not significantly different between groups ($P = 0.598$), visit ($P = 0.753$), or group-by-visit interaction ($P = 0.418$). No other differences in either blood pressure or vascular assessments were observed post-EIMD. **CONCLUSIONS:** In contrast to our hypotheses, a modest elevation in diastolic blood pressure was observed 48-h post-EIMD in the PRWP condition. The training history / status of our participant sample may have restricted the ability to detect EIMD-induced vascular perturbations.

P508: THE ASSOCIATION BETWEEN PROTEIN INTAKE AND LEAN MASS IN NON-HISPANIC BLACK AND EAST ASIAN FEMALES

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BACKGROUND: Low lean mass is associated with increased disease and injury risk as well as decreased quality of life. Protein (PRO) intake is an important strategy to maintain lean mass (LM). There is limited data evaluating the association between PRO intake and LM in non-athletic, young adult, female populations, and even less in females of color. The purpose of this study was to characterize PRO intake and evaluate the association between PRO intake and LM in females of color. **METHODS**: 86 Non-Hispanic Black (n=43) and East Asian (n=43) females (Age: 22.5±3.8 yrs, BMI: 22.8±3.5 kg/m2, %fat: 31.4±5.7%) enrolled in this study. Participants completed a 3-day dietary log; each reported all food and beverage intake for two weekdays and one weekend day. A dietary analysis software assessed total caloric intake and PRO intake. LM was assessed using dual-energy x-ray absorptiometry and moderate to vigorous physical activity (MVPA) was quantified by the International Physical Activity Questionnaire. Two separate multiple linear regression analyses were performed to assess the association between LM and PRO intake, and LM and PRO intake as a percentage of total calories (%PRO). Each model controlled for race, age and MVPA. **RESULTS**: Average PRO intake was 87.0 ±30.7 g, %PRO was 17.8±5.1% and relative PRO intake was 1.3±0.4 g/kg. After accounting for covariates, there was a significant correlation between PRO intake and LM ($p<0.001$, $\Delta r^2 =0.126$) and a significant correlation between %PRO and LM ($p<0.001$, $\Delta r^2=0.06$). **CONCLUSIONS**: In our sample of NH Black and East Asian females, PRO intake was well above the RDA (0.8 g/kg) and was within the recommended percentage of total calories (10-35%). PRO intake and %PRO were significantly related to LM after accounting for age, race and MVPA. Based on our results, total PRO intake had a stronger association to LM than %PRO. LM is an important variable for several health and wellness outcomes; therefore, future studies should evaluate these associations in a larger sample of females of color who have an increased risk for cardiometabolic diseases. Additionally, future research should investigate the efficacy and acceptability of an intervention to increase PRO intake to support cardiometabolic health in young adult females of color. **FUNDING**: Research was supported by the NIH NIDDK (P30DK056350).

P509: CHARACTERIZATION OF SEGMENTAL RAW BIOELECTRICAL IMPEDANCE VALUES IN WOMEN ACROSS DIFFERING HORMONE PHASES AND PROFILES

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Background: Raw bioelectrical impedance values (impedance [Z], resistance [R], reactance [Xc], phase angle [PhA]) offer insights into cellular integrity and tissue hydration, which fluctuate with female hormone phases and profiles. Fluid loss during the low hormone phase (LHP) may increase Xc and PhA, while extracellular water tends to rise during the high hormone phase (HHP), potentially lowering R and PhA. Most research has focused on whole-body assessments, but segmental analysis (arms, legs, trunk) may reveal region-specific physiological effects. This study aims to characterize differences in segmental bioimpedance between LHP and HHP in eumenorrheic (EUM) and oral contraceptive (OC) users. **Methods:** Sixteen women (EUM=8, OC=8) (age: 23.9±4.0 yrs; BMI: 24.1±2.9 kg/m²; skeletal muscle mass [SMM]: 26.2±2.4 kg; %BF: 28.5±5.8%) completed bioimpedance measures (Z, R, Xc, and PhA at 5, 50, and 250kHz) once in LHP and HHP using a multifrequency device (InBody 970, Seoul, South Korea). Group × phase interactions were evaluated using 2x2 ANOVAs. **Results:** There was a significant interaction for PhA of the right arm at 250 kHz (p=0.039); PhA was significantly different between LHP and HHP for EUM (MD±SE: -0.125±0.043; p=0.011), but not OC (p=0.774). No other interactions reached significance (p>0.05). EUM had significantly lower Xc than OC in the right arm (5kHz: -1.963±0.903 Ω, p=0.047; 250kHz: -3.538±1.330 Ω, p=0.019), left arm (5kHz: -2.150±0.925 Ω, p=0.036; 250kHz: -3.450±1.464 Ω, p=0.034), and trunk (5kHz: -0.350±0.148 Ω, p=0.004; 250kHz: -0.356±0.139 Ω, p=0.023) as well as lower PhA in the trunk (5kHz: -0.350±0.148°, p=0.033). No significant phase effects were observed (p=0.061-0.983), but within EUM, bioimpedance values tended to be higher in HHP, particularly in the arms (p>0.05). **Conclusions:** Results suggest a trend of higher raw bioimpedance values, particularly Xc and PhA, in OC compared to EUM. Though the physiological basis remains unclear, PhA shifts are likely due to changes in Xc, which at lower frequencies may suggest alterations in extracellular fluid composition. Alternatively, EUM may also experience more dynamic changes in cell membrane properties, while OC users may have more stable membranes. Larger studies are needed to confirm these trends and provide deeper physiological insights.

P510: THE RELATIONSHIP BETWEEN HYDRATION STATUS AND COGNITION IN LACTATING WOMEN

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Literature has shown that fluid restriction results in decrements in cognitive performance in the general population, and lactating females are particularly vulnerable to hypohydration due to the fluid demands of lactation. Therefore, the purpose of this analysis was to evaluate the relationship between hydration status and cognitive performance in postpartum, lactating women. Participants were at least three months postpartum and primarily breastfed their baby, supplementing with a maximum of eight ounces of formula per day. Participants provided a first morning urine sample and collected urine for 24-hours, and urine specific gravity (USG) was evaluated. Urine volume and color were also assessed. Cognition was evaluated utilizing the NIH Toolbox Cognition Battery, which provides a composite score of cognitive abilities based upon a battery of cognitive function measures. Pearson correlations between hydration status markers and cognition were then calculated. Overall, participants scored in the 97.4±3.6 percentile for cognition. Mean first morning urine USG was 1.015±0.004 while 24-hr USG was 1.013±0.004. There were no statistically significant correlations between the fully corrected t-score for cognition and first morning urine USG (r=0.53, p=0.36), 24-hr USG (r=0.78, p=0.12), first morning urine color (r=0.72, p=0.17), or 24-hr urine color (r=0.82, p=0.09). Though there were no significant relationships between variables, correlations are moderate and may increase more data is collected.

P511: DOG OWNERS TALK THE TALK ABOUT WALKING THE WALK: A QUALITATIVE EXPLORATION OF ACTIVITY PARTICIPATION

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Introduction: Nearly one in two households in the US own a dog. While dog owners tend to be more active than non-dog owners, there are many inactive dog owners. This study explored factors that positively and negatively influence physical activity levels and dog walking among dog owners. **Methods:** Adult dog owners who were a primary caregiver of their dog(s) were recruited via social media to participate in a semi-structured interview. Interview questions explored dog owner's activity/exercise with and without their dog(s) and the factors that helped and interfered with activity. Interviews were conducted over the phone, audio-recorded, and transcribed verbatim. Data analysis was completed using constant comparative methodology, grounded theory and open coding. **Results:** Participants (n=20) were primarily female (90%) and White (90%), were 42.0±13.5 years old and participated in dog walking on 4.9±2.0 days/week. Four main themes emerged and were further broken into

subthemes: 1) barriers to physical activity: physical health, seasons/weather, and time/schedule, 2) barriers to dog walking: dog specific limitations and weather/temperature, 3) facilitators to physical activity: access to resources, environment/infrastructure, partner/social support, physical and mental health, and weather, and 4) facilitators to dog walking: dog personality and behavior and obligation to dog and/or dog owner lifestyle. **Discussion:** The current study found common barriers and facilitators to physical activity participation and dog walking among dog owners. Some influences are consistent with previous literature regarding physical activity engagement; however, there were some unique factors specific to dog owners and their dogs. Addressing some of the observed factors like offering tailored programs/workouts for busy schedules, indoor options for bad weather, promoting social support, and providing low-resource options may be helpful strategies to increase activity among dog owners. Unique to dog walking, it is critical to overcome dog specific limitations (i.e., behavioral concerns, health, personality), and focus on the sense of obligation/responsibility of the dog owner.

P512: DOES SELF-EFFICACY MEDIATE THE EFFECTS OF A DIGITAL DIABETES PREVENTION PROGRAM ON HEALTH BEHAVIORS?

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BACKGROUND Although digital diabetes prevention programs (d-DPP) have been shown to be effective at changing lifestyle behavior and inducing weight loss, it is unknown whether these approaches impact theoretically relevant behavior change constructs. The purpose of this study is to test whether self-efficacy mediates the impact of d-DPP on physical activity and diet behaviors. **METHODS** The Preventing Diabetes with Digital Health and Coaching for Translation and Scalability (PREDICTS) trial randomized volunteers with prediabetes (n=599; mean age 55.4±12.7 years, 61.4% female, 91.3% white) to either a d-DPP or a small group education (SGE) condition. The d-DPP provided 12-months of a weekly educational curriculum, lifestyle coaching, virtual peer support, and behavior tracking tools. The SGE received one group session involving weight loss and action planning. The outcomes for this study were baseline to 12-month changes in moderate to vigorous physical activity (MVPA) and diet. Self-efficacy was measured relative to physical activity (PASE) and healthy eating (HESE). Two, multi-step regression analyses were conducted to test the hypothesis that self-efficacy mediated the effect of the intervention on MVPA and diet behaviors. **RESULTS** For physical activity, intervention assignment was not significantly related to changes in self-efficacy (b = 1.87, t = 1.09, p = .27); changes in self-efficacy were related to changes in MVPA (b = 1.58, t.=2.54, p = .01); and the intervention was related to changes in MVPA (b = 45.10, t = 2.04, p = .04). However, the indirect effect of self-efficacy was not significant (b = 2.96, 95% CI = -2.36, 10.76) indicating no mediation. Relative to diet, the intervention significantly predicted changes in self-efficacy (b = 5.13, t = 3.02, p = .0003); changes in self-efficacy were related to changes in diet (b = -.022, t = -3.40, p = .0007); and intervention assignment was related to changes in diet (b = -.70, t = -2.98, p = .003). Additionally, the indirect effect was significant (b= -.11, 95% CI = -.23 and -.03) indicating partial mediation by self-efficacy. **CONCLUSION** Digital approaches to health behavior change have the potential to impact theoretically relevant constructs. More research is needed to refine intervention components to maximize intervention effectiveness on health behavior change.

P513: TRANSLATION AND CULTURAL ADAPTATION OF THE PHYSICAL ACTIVITY-RELATED HEALTH COMPETENCEQUESTIONNAIRE FOR THE ENGLISH-SPEAKING POPULATION

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BACKGROUND: The physical activity-related health competence (PAHCO) model integrates health and physical literacy, focusing on movement, control, and self-regulation competencies, which are essential for improving health outcomes of physical activity. While the questionnaire has been validated in German, an English version is necessary for wider use. Thus, the aim of this study was to develop a linguistically valid version of the PAHCO questionnaire in English. **METHODS:** Following established guidelines, two independent bilingual translators first performed a forward translation of the 25 PAHCO questions from German to English. The translations were synthesized in a consensus meeting, followed by back translation into German by two new translators unfamiliar with the original questionnaire. An expert committee reviewed all versions to ensure cross-cultural adaptation, creating a pre-final version. To evaluate the readability of the pre-final version, pilot testing was conducted with 22 participants (59% F, 37 ± 15y) who completed the PAHCO survey, rated the ease of understanding each item, and provided feedback during cognitive interviews. Interviews were transcribed verbatim, and participant quotes were used to assist in analyzing the quantitative ranking results and refining the questionnaire. **RESULTS:** Participants rated 80% of the questions as "extremely easy" or "moderately easy" to understand Following all interviews, 56% of questions received substantial feedback on wording or phrasing. The most common feedback involved critiquing ambiguous or awkward terms like "my body," "tense in my muscles," and "relieve built-up stress." The use of vague terms such as "feel good" and "bad" were critiqued for lacking clarity. **CONCLUSION:** The translation process resulted in a generally clear questionnaire, significantly improved through user feedback and expert discussions. The English PAHCO version now requires thorough psychometric testing to evaluate its reliability and validity.

P515: IMPACT OF LEG LENGTH ON CADENCE-BASED WALK-TO-RUN TRANSITION THRESHOLD IN ADULTS

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BACKGROUND: Cadence (steps/min) can be used to evaluate and predict walk-to-run transition (WRT). A previous study determined that the WRT occurs between cadence values of ~135 and 140 steps/min in adults. However, the effect of anthropometric characteristics, such as leg length, on these thresholds is unclear. **PURPOSE**: To examine the impact of leg length (LL) on cadence-based WRT threshold in adults. **METHODS**: Forty-four participants (22 ± 3.5 years, 68% women) performed four × 3-min treadmill bouts at 0.89, 1.34, 1.79, and 2.24 m/s (2, 3, 4, and 5 mph). Cadence was calculated by dividing the total number of steps per bout (directly observed and video verified) by bout duration. True WRT was visually classified by direct observation of walking vs. running gait during each trial (and confirmed from video recordings). The data was subset by LL (measured from the anterior superior iliac spine to medial malleoli; average of left and right leg) into tertiles (short [78.0-85.6 cm], medium [86.0-94.2 cm], tall [95.3-105.0 cm]). Receiver Operating Characteristic curve analysis and Youden's Index (sensitivity + specificity - 1) were used to calculate the optimal cadence threshold for predicting the WRT in each LL group. Sensitivity, specificity and accuracy values were computed for each optimal threshold using confusion matrices. **RESULTS**: Leg length appears to impact cadence-based WRT thresholds. Optimal threshold was highest for the shorter LL group (145 [95% CI: 142-148] steps/min; sensitivity = 100%, specificity = 100%, accuracy = 100%), followed by the medium LL group (138 [95% CI: 135-145] steps/min, sensitivity =100%, specificity = 98%, accuracy = 98%), and finally the taller LL group (136 [95% CI: 132-145] steps/min, sensitivity =100%, specificity = 90%, accuracy = 93%). **CONCLUSION**: Cadence-based WRT thresholds appear to be highest in individuals with short LL and decrease as LL increases. Our findings emphasize the importance of considering LL when using cadence to predict WRT. In application, cadence is a valuable tool for the prediction and control of gait behavior in research.

P516: SCIENCE IN MOTION: EXPLORING WAYS TO INCREASE CHILDREN'S PHYSICAL ACTIVITY DURING THE SCHOOL DAY

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BACKGROUND: Only 24% of children meet the recommended physical activity (PA) guidelines, with many spending more time in front of screens and less time outdoors. Integrating PA into classroom lessons, including science, both in inside and outside settings, can provide valuable opportunities for increasing children's PA levels. The purpose

of this study was to investigate children's PA levels across the school day and examine differences in settings during science lessons. METHODS: Participants were first-grade children (N=42, 44% boys, 56% girls, average age 6.36±0.28 years, from three classrooms in a Title 1 Lab school associated with a university in western NC. PA was integrated into science lessons using three settings: indoor non-active, indoor active, and outdoor active. Children also received physical education (PE) once per week. Accelerometers were used to estimate PA using Evenson cut points for step counts and moderate to vigorous physical activity (MVPA). Data was collected during three two-week periods (December, February, May). Teachers placed and removed accelerometers on the children at the start (7:55am) and end (2:50pm) of the school day. Exploratory t-tests compared step counts and MVPA between PE and non-PE days, while repeated measures ANOVA analyzed PA differences between science lesson settings ($p<0.05$). RESULTS: Children took an average of 3,653 steps per day and spent 26.07 minutes in MVPA. PA was significantly higher on PE days compared to non-PE days on both step count ($p=0.001$) and MVPA ($p=0.001$). However, no significant differences were observed in step counts or MVPA between the science lesson settings. There was no interaction effect between lesson setting and classroom for step count or MVPA minutes. CONCLUSIONS: Integrating PA into science lessons provided additional opportunities for children to engage in PA. The impact did not differ significantly across classrooms where the science lessons occurred. Since PE only occurs one per week, finding ways to integrate PA throughout the school day is essential. Collaboration between PE and classroom teachers may help design lessons to promote higher PA levels and improve student health and engagement.

P517: THE ASSOCIATION BETWEEN PROLONGED SEDENTARY BEHAVIOR AND PERCEIVED PSYCHOLOGICAL STRESS

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BACKGROUND: Cardiovascular disease (CVD) is a leading cause of mortality, with perceived psychological stress (PPS) recognized as a key risk factor. High levels of PPS are prevalent among college-based young adults (CBYA). Identifying which lifestyle behaviors are associated with PPS is essential for developing effective CVD prevention strategies in this population. Research has demonstrated positive associations between total sedentary behavior (SB) time and PPS. Prolonged, uninterrupted SB (PUSB) is particularly hazardous for depressive symptoms and other mental health outcomes, but the relationship between PUSB and PPS remains poorly understood. This study aimed to test the association between PUSB and total SB time with PPS. METHODS: CBYA (N = 270; mean ± SD age 20.2 ± 1.6 years; 69% female; 60% White) completed a laboratory visit where the 10-item Perceived Stress Scale (PSS; scoring range: 0-40) was administered to measure global PPS. Following the laboratory visit, participants wore an activPAL4 for seven days to measure PUSB (average daily minutes spent in SB bouts >60 min and >30 min) and average daily minutes of total SB, with data calculated using PALanalysis software. To examine associations of PUSB and total SB time with PPS, separate linear regression models were run in jamovi, which were adjusted for *a priori*-determined covariates (age, sex, race, activPAL wear time, moderate-to-vigorous physical activity time, body fat percentage). This is an ongoing study with a recruitment target of N=500. RESULTS: In this preliminary analysis, the mean PSS score was 21.0 ± 3.4. Total SB time averaged 448 ± 120 min/day, with PUSB >60 min at 132 ± 85 min/day and PUSB >30 min at 263 ± 101 min/day. PUSB >60 min (β = -.007, 95% CI: -.012 to -.002, p = .011) was negatively associated with PPS, while total SB time (β = -.003, 95% CI: -.008 to .001, p = .105) and PUSB >30 min (β = -.004, 95% CI: -.008 to .000, p = .076) were not significantly related. CONCLUSIONS: Longer duration PUSB bouts may reflect coping strategies in CBYA, such as watching television, which may help explain the negative association with PPS. Conversely, total SB time and shorter duration PUSB bouts likely encompass activities that do not confer benefits to PPS, including studying. Future research should confirm which specific domains of SB are linked to PPS in CBYA.

P518: EXERCISE INTERVENTION AND KNOWLEDGE OF GAIT ENHANCE MOBILITY IN AFRICAN AMERICAN WOMEN

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BACKGROUND: Gait can reflect a person's overall health and has long been recognized as a vital element of physical well-being, particularly for obese individuals with health concerns such as hypertension, cardiovascular disease, and type 2 diabetes. African American (AA) women are a demographic at increased risk for these health concerns, as well as for diminished gait performance. **PURPOSE:** This study investigates the impact a 24-wk supervised exercise program had on functional gait in Obese AA women. **METHODS:** Twenty- eight Obese (%Body Fat 43.4±2.6%) AA women (Age 51.27±12.73 y) participated in a tiered 24-wk fitness program. Gait assessments including the 6-minute walk (6MWD) distance in meters (m) and Timed Up and Go (TUG) test in seconds (s) were conducted at baseline, 12-wks, and 24-wks. Participants self-selected into a supervised exercise group that met three times per week3x/week, either in the morning or afternoon, based on their availability. Each session included cardiovascular exercise, resistance training, and stretching routine for recovery. Significance of the 6MWD and the TUG time were determined using Repeated Measures ANOVA. **RESULTS:** The results indicate that the 24-week training program led to an improvement in gait function. Statistically significant increases in the 6MWD were seen from baseline (497.2±48.9m), 12 weeks (532.0±75.9m; p=0.014) and 24 wks. (553.2±76.6m; p=0.00). Additionally, a statistically significant decrease in the TUG speed was seen from baseline (9.46±1.39s) compared to 12-wks (8.69±1.57s; p=0,039), and 24-wks (8.47±1.08s; p=0.00). **CONCLUSION:** This demonstrates that participants who remained consistent with the program were able to improve their gait function through exercise training. This study provided valuable insights on enhancing gait patterns through regular exercise and increased mindfulness about overall health and physical condition.

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P519: RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND PERCEIVED COMPETENCE FROM PHYSICAL ACTIVITY CLEARINGHOUSE FOR EDUCATION (P.A.C.E.) DATA

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Purpose: A dramatic decline in physical activity (PA) participation with the progression of school age testifies to the urgency for schools to implement assessment procedures for accumulated PA during school hours as well as identify and reduce barriers to PA engagement. This study sought to quantify PA during school hours and determine the relationship with perceived motor competence (PMC). **Methods**: Students enrolled in local elementary schools (3rd-5th grade) wore accelerometers for 5 consecutive days during school hours. The sport-skill subscale of the Self-Perception Profile for Children (SPPC) was utilized to evaluate youth perceptions of their ability to complete skill-related tasks which provides an indication of PMC. All accelerometer data was processed through ActiLife software (v6.13.6) using 5-second epochs while statistical analyses were performed in SPSS (v.29.0). **Results**: Students (N=258) spent a large amount of time as sedentary during PA opportunity times. During recess, 40.1% of the offered time was considered sedentary and 75.5% of the offered time was accounted for when combining sedentary and light intensities. Similar results were seen during P.E. with 43.1% being sedentary and 75.6% of the offered time being sedentary and light intensities combined. Students showed low overall levels of PMC (2.6 ± 0.4) on the four-point SPPC scale as well as a trending decrease in PMC with age (r=-0.26, p=0.01). Correlation analyses showed PMC and PA were strongly correlated (r=0.49, p=0.01). Along with the decreased PMC with age, the overall engagement in moderate to vigorous PA (MVPA) decreased from 52.3 ± 13.0 total minutes for 3rd grade students to 34.6 ± 10.0 total minutes for 5th grade students. **Conclusions**: This study used a quantitative approach to evaluate PA during school hours and a well-validated assessment of PMC (SPPC) to determine its influence on PA behaviors. Overall, the level of PA fell far short of the recommended 30 minutes of MVPA during school hours. These results also suggest the need for stronger motivational strategies to increase student efficacy beliefs and healthy behaviors. This information provides

valuable insight to the health status of children during school hours and the need for revised attention to PA standards.

P520: EFFECTS OF EDUCATIONAL CONTENT ON WALKING INTERVENTION ADHERENCE AND ASSOCIATED HEALTH OUTCOMES

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BACKGROUND: Walking has been shown to improve psychological and physiological well-being and is a form of exercise easily accessible to all. Physical inactivity is a concern for the global population as it contributes to a lower quality of life, greater possibility for chronic disease, and morbidity. The purpose of this study is to determine whether adherence to an exercise intervention improves when educational health-related content is delivered. The secondary purpose is to determine whether adherence to the program plays a significant role in psychological and physiological improvements. **METHODS:** 30 participants who self-select to participate in an outdoor walking group intervention by the Exercise is Medicine® on campus program at a small private college. Participants will be randomized into two intervention groups. The instruction group (INS) will only receive instructions to walk a specific route each week, while the education group (EDU) will receive the same instructions with additional health-related content. The walking routes will be outdoors and should take approximately 20-30 minutes to complete. At baseline, subjects will complete the Health-Related Quality of Life-14 (HRQoL-14), Patient Health Questionnaire (PHQ-9) and Perceived Stress Scale (PSS) surveys to assess mental health-related outcomes. Body composition will be measured using a multifrequency bio-impedance analysis (BIA)-scale. After 6 weeks, subjects will repeat measures from baseline. Adherence to the program will be determined based on self-reporting of whether the subject completed the route each week. Emails will be sent to remind participants to self-report participation. The results will be assessed using a repeated measure ANOVA. **ANTICIPATED RESULTS:** We anticipate that educational content related to health and fitness will improve adherence to the walking program by motivating participants to continue in their health and fitness goals. We also anticipate that we will see improvements in psychological health and anthropomorphic measures in those who better adhere to the walking program.
FUNDING: Appalachian College Association Ledford Scholars program

P521: INFLUENCE OF 16-WEEK MINIMAL EXERCISE INTERVENTION ON BODY COMPOSITION IN TYPE-2 DIABETICS

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BACKGROUND: Diabetes is a challenging metabolic condition with complicated physical and metabolic consequences. A commonly reported issue with exercise-based treatment of Type-2 Diabetes (T2DM) is that durations of prescribed interventions are too long, and interventions lack the appeal to establish positive metabolic changes. Our group developed a short duration high-intensity bodyweight circuit (HIBC) to address this issue. Importantly, body composition (BC) plays a strong role in metabolic function and it is unknown if the minimal HIBC exercise program will be sufficient to alter BC. Therefore, the purpose of this study was to evaluate BC pre and post 16-week HIBC intervention in participants with T2DM. METHODS: Participants between the ages of 40-65 diagnosed with T2DM were recruited for this study. Total of 7 participants completed : 2 females (54±5.6yrs) and 5 males (53±1.5yrs). Prior to the intervention, participants underwent a body composition assessment utilizing dual-energy x-ray absorptiometry (DEXA). Participants then completed a 16-week HIBC intervention consisting of 10 banded, bodyweight squats, 5 modified pull-ups, 5 modified push-ups, and 10 abdominal crunches. Participants completed as many cycles of intervention as possible within 5, and progressing to 10 minutes during the 16-week intervention. Similarly, session frequency progressed from 3 to 4 days per week. All assessments were repeated following the 16-weeks. RESULTS: Body Composition Pre and Post changes: Body Fat %: 35.9 ± 4% vs 36.3 ± 4% (p = 0.503), Fat Mass: 31.2 ± 5.6 kg vs 31.0 ± 5.8 kg (p = .898), Lean Mass: 53.5 ± 9.4 kg vs 54.6 ± 9.6 kg (p = .032), Bone Mineral Content: 3.2 ± 0.5 kg vs 3.1 ± 0.5 kg (p = .919), Fat Free Mass : 59.2 ± 11 kg vs 60.1 ± 11 kg (p = .046), Body Mass Index: 29.6 ± 2 vs 29.8 ± 2 (p = .548), Body Weight: 91.1 ± 15 kg vs 91.8 ± 14 kg (p = .340). CONCLUSION: The HBIC intervention appeared to not sufficiently decrease body fat or its percentage. Additionally, bone mineral content was unaltered. Interestingly, the HIBC was effective in increasing FFM, which has been shown to be difficult in aging populations. Overall, the HBIC may have clinical appeal as an intervention for T2D due to its ability to increase lean mass.

P522: INFLUENCE OF THROWING-ARM PAIN ON INTRA-INDIVIDUAL ELBOW FLEXION VARIABILITY IN YOUTH BASEBALL PITCHERS

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BACKGROUND: Limited or excessive movement variability during a complex motor task may alter the temporal organization of a mechanical variable, thus changing the movement's dynamics. The purpose of this study was to temporally compare intra-individual variability of the elbow during the baseball pitch between groups of players experiencing throwing-arm pain (ETAP) or not experiencing throwing-arm pain (nETAP). **METHODS:** 19 youth pitchers (13.3±1.8y;164.9±12.5cm;56.7±14.0kg) were selected from a database having self-reported ETAP at a location (joint/segment) related to the pitching arm. A second group of 19 youth pitchers (13.2±1.7y;164.9±12.5cm;56.7±14.0kg) was then selected from the database having self-reported nETAP and matched according to the age, height, and mass of the individuals in the ETAP group. Kinematic data were collected on pitchers throwing three fastballs at a regulation distance. Kinematic data were filtered with a cutoff of 13.4Hz and exported at 100Hz. For all trials, elbow flexion angle was extracted and linearly interpolated to 101 data points between foot contact and ball release (0-100%). The standard deviation of elbow flexion for each percentage of the pitch was determined for each pitcher. A statistical non-parametric mapping t-test was performed on intra-individual elbow flexion variability from 0-100% of the pitch between ETAP and nETAP groups. A t-test was used to compare playing experience. **RESULTS:** There was a statistically significant (t>2.79, p<.05) difference in intra-individual elbow flexion variability between groups from 91% to 99% of the pitch. Competitive playing experience (ETAP:6.9=3.0y, nETAP=5.9±2.5y) between groups was not significantly different (t=1.12,p=.26). **CONCLUSION:** Pitchers' ETAP had significantly less intra-individual elbow flexion variability nearing ball release (91-99%). In youth, a higher degree of elbow flexion variability when pitching may help distribute stresses on the arm thereby promoting arm health.

P523: KINESIOPHOBIA AND REACTION TIMES IN PATIENTS WITH CHRONIC ANKLE INSTABILITY

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BACKGROUND: Patients with chronic ankle instability (CAI) report higher levels of kinesiophobia and slower reaction times (RT) compared to healthy individuals. The purpose of this study was to determine if there is a relationship between levels of kinesiophobia and RT in patients with CAI. METHODS: A total of 28 patients with CAI (16M/12F, 22.2±5.96yrs., 172±10.4cm, 74.2±11.5kg) participated in a laboratory session. Injury-related fear was assessed with the Tampa Scale of Kinesiophobia 11 (TSK-11). Patients completed a series of RT tasks: 1) an upper extremity test by balancing on their involved limb and quickly deactivating lights on a board in front of them with their hands, 2) a lower extremity test by standing on their noninvolved limb and quickly deactivating lights on the ground with their involved limb, 3) an unanticipated run-decide task by running forward and cutting to the left or right to deactivate a light based on a predetermined color, and 4) a forward and lateral single-limb hop to stabilization test that required patients to react to a light indicating when they should jump over a hurdle and land on their involved or noninvolved limb. Average RTs for all tasks were recorded. Pearson's r examined the relationship between RT and TSK-11 scores with $\alpha \leq 0.05$. RESULTS: A moderate positive relationship was observed between slower RT in the unanticipated run decide task for the involved (r=0.43) and noninvolved (r=0.42) limbs ($p<0.05$) and higher levels of fear of re-injury. No other relationships were observed ($p>0.05$). CONCLUSION: There may be a task specific relationship between fear of re-injury and RT in patients with CAI. Specifically, higher kinesiophobia may be related to slower RT on dynamic tasks requiring change in direction and decision making. FUNDING: This work was supported by The Office of the Assistant Secretary of Defense for Health Affairs, through the Peer Reviewed Orthopaedic Research Program under Award No.

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P524: EMG OF VASTUS MEDIAL OBLIQUE ACTIVATION DURING THE ATG 140-DEGREE, BULGARIAN, AND DECLINE SQUATS.

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BACKGROUND: The purpose of this study was to evaluate a social media influencer's (@TheKneesovertoesguy) claim that the ATG 140-degree split squat (ATG) selectively activated the vastus medial oblique (VMO) by measuring the muscle activation of the VMO, vastus lateralis (VL), and rectus femoris (RF) during the ATG, Bulgarian split squat (BSS), and double-leg 20-degree decline squat (DS). **METHODS**: Nine (6F, 3M) physically active college-aged subjects (Age = 19.6±.56, height = 169.1±9.08 cm, weight = 73.5±17.5 kg) completed the study. Surface electromyography (sEMG) was measured on the VMO, VL, and RF based on standardized anatomical guidelines and the use of a goniometer. Subjects completed a 5-minute warm-up on a stationary bike (Monark 894E), a maximum voluntary isometric contraction (MVIC) knee extension at a 90-degree angle using a Kieser knee extension machine, followed by 1 set of 3 repetitions for each squat variation: ATG, BSS, and DS. Squats were performed at 20% body weight (14.6±3.5 kg), and each set was separated by a 120-second rest period. The squat exercises were performed in a random counterbalanced order. EMG data was collected using sEMG electrodes (Trigno, Delsys, Natick, MA). Peak sEMG data was averaged across the three repetitions per set and then normalized to the participants' MVIC. Separate 1x3 Repeated Measures ANOVA's were conducted with follow-up pairwise comparisons. **RESULTS:** Results indicated no significant differences in VMO (p = 0.213) (ATG: 139.6%±56.5%, BSS: 134%±61%, DS:120.66%±74.7%), VL (p = 0.219) (ATG: 142.6%±80.6%, BSS: 131.9%±76.2%, DS: 126.5%±66.3%), or RF (p = 0.228) (ATG: 116.4%±68.3%, BSS: 110.7%±64.8%, DS: 151.6%±99.8%) activation for the observed squat variations. **CONCLUSIONS:** This present study suggests no difference in muscle activation of the VMO, VL, and RF between ATG, BSS, and DS exercises. The finding refutes the social media claims stating the ATG preferentially activates the VMO.

P525: THE ROLL OF MULTIFIDUS IN AXIAL ROTATION OF THE NECK WITH HEAD SUPPORTED MASS

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IntroductionThe cervical extensor muscles play a key role in driving and stabilizing neck axial rotation. Analysis of the cervical extensors is limited mostly to the more superficial muscles as electromyography techniques are invasive as such multifidus has been understudied for its contribution to posture and neck movement . Shear wave elastography (SWE) has shown the ability to assess the shear modulus of the cervical extensors individually. Shear modulus in muscle is augmented by passive and active force production. In this study we employed ultrasound shear wave elastography to estimate muscle forces in the cervical extensors. One aim was to investigate multifidus during head rotation.**Methods**40 healthy volunteers participated in this study (19 women, 21 men; 24.2±2.77). Resting SWE images were taken in a prone neutral posture before. Active SWE images were taken of 5 cervical extensors and sternocleidomastoid during isometric neck extensions. Subsequently, SWE images were taken seated without and with a weighted helmet in neutral, and with low (<60°) and high (>60°) axial rotation. Muscle forces were estimated by subtracting the shear modulus at rest from the shear modulus in active state and multiplying by the cross-sectional area of the muscle.**Results**In both the low and high degree turns muscle force from the multifidus was significantly increased from a neutral head posture and muscle force from the multifidus was significantly higher than any other cervical extensor. There was no significant change in muscle force of the multifidus between the low and high turned positions. Introduction of the weighted helmet significantly increased multifidus force across all head positions.**Conclusion**The results provide new insights into the contribution of the multifidus muscle during cervical axial rotation and supporting additional head mass. In turned head postures the cervical spine vertebrae become less stable, requiring greater input from deep muscles to maintain the posture. The angle of multifidus also gives it a horizontal force component, allowing the muscle to contribute to axial rotation. These results highlight the importance of including multifidus in biomechanical analysis and modeling of the neck and spine.**Acknowledgements**This work was supported by the Office of Naval Research

P526: AGING ADULTS AMBULATE WITH HIGHER HIP ABDUCTION SIMILAR TO ADULTS WITH HIP OA

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BACKGROUND: Approximately 27% of adults over 45 years old exhibit radiographic hip osteoarthritis (OA). Hip OA consists of progressive joint degeneration that leads to severe hip pain, dysfunction, and poor quality of life. The underlying hip mechanics associated with onset of hip OA in aging adults are not well understood. Therefore, the preliminary purpose of this study was to assess hip joint mechanics in healthy, asymptomatic aging individuals (≥ 45 years of age) and young adults (< 45 years of age) during walking to determine potential biomechanical markers associated with onset of hip OA in the aging population. **METHODS:** 14 healthy, asymptomatic adults (7 F; age: 58.4±10.5 yrs.; BMI: 26.5±2.74 kg/m^2) and 14 sex and BMI-matched healthy, asymptomatic young adults (7 F; age: 23.3±3.33 yrs.; BMI: 26.0±2.74 kg/m^2) underwent 3D gait analysis on a dual belt instrumented treadmill at a self-selected speed. Depending on data normality, between-group differences in gait speed, sagittal, frontal, and transverse plane hip joint kinematics and kinetics of the dominant limb were assessed using either independent t-tests or Mann Whitney U-tests with an alpha level set at 0.05. **RESULTS:** Walking speeds were not different between groups (p>0.05). The aging group ambulated with a significantly higher peak hip abduction angle (p=0.02) and significantly lower peak hip adduction angle (p=0.05). There were no significant differences in any other hip joint kinematic or kinetic parameters. **CONCLUSIONS:** Although our cohort of aging adults ambulated with a higher amount of hip abduction compared to young adults, the direct link between increased hip abduction and hip joint degeneration in aging adults is not well understood. Further evaluation is needed to understand the link between frontal plane hip mechanics and hip degeneration in order to develop interventions to prevent the onset of hip OA in aging adults.

P527: TDCS DOES NOT ALTER CENTRAL OR PERIPHERAL HEMODYNAMICS IN ADULTS AGED 60 YEARS OR OLDER

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Increased neural activity induces changes in blood flow and when blood flow increases to activated brain areas, oxygen supply is greater than consumption. The dorsolateral prefrontal cortex (DLPFC) manages cognitive control of behavior, by processing internal and external cues related to exercise such as perception of effort and knowledge of exercise endpoint. Anodal transcranial direct current stimulation (a-tDCS) has been linked to increased neural activity by enhancing the rate at which neurons fire. However, the effects of a-tDCS of the DLPFC during exercise are not well understood, specifically in adults over 60 years of age. **PURPOSE:** The purpose of this study was to determine if a-tDCS of the DLPFC would alter central or peripheral hemodynamics during exercise in adults over 60 years of age. **METHODS:** In this randomized, single-blinded, cross-over design, 25 participants (Mean ± SD; 71.08 ± 5.64 years) completed five maximal voluntary contractions, followed by 20 minutes of a-tDCS or SHAM (stimulation is turned off after 30-s) conditions. Next, participants completed a handgrip time-to-failure task by maximally squeezing a handgrip dynamometer until they could no longer maintain 50% of their maximal voluntary contraction. During which DLPFC and flexor carpi radialis (FCR) hemodynamics were assessed via near-infrared spectroscopy. **RESULTS:** There was no main effect of condition on changes from baseline DLPFC oxygenated hemoglobin (HbO) values, F(1, 24) = 0.523, p = 0.476, $\eta p2$ = 0.21. Additionally, There was no significant effect of condition on changes in baseline FCR HbO values, F(1, 16) = 0.49, p = 0.827, $\eta p2$ = 0.003. **CONCLUSION:** a-tDCS of the DLPFC did not induce changes in central or peripheral hemodynamics in older adults. These findings are consistent with previously reported literature regarding the acute effects of a-tDCS on hemodynamic response during exercise, future work should include a true control group.

P528: NO DIFFERENCES IN THROWING KINEMATICS BETWEEN HIGH SCHOOL AND COLLEGE CATCHERS WITH AND WITHOUT PAIN

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BACKGROUND: In baseball(BB) and softball(SB) games, catchers typically make the most throws compared to other players. Most of these throws are submaximal, returning the ball to the pitcher, with occasional maximal throws to prevent baserunners from advancing. Despite the large volume of throwing and the occurrence of overuse injuries among catchers, there is a limited amount of literature analyzing kinematics related to injuries in this position. Thus, this study aimed to investigate the differences in throwing kinematics between catchers who experience upper extremity pain and those who are pain-free. METHODS: Motion capture data were collected for 20 catchers, 6 BB (1.74 ± 0.11m, 68.5 ± 17.4kg, 15 ± 1y) and 14 SB (1.68 ± 0.06m, 74.7 ± 11.9kg, 16 ± 2y), using an electromagnetic tracking system. Participants conducted three pop-up throws, throwing to a target (25.6m and 27.4m for SB and BB, respectively). For analysis, participants were split into groups of 10, delineated by the presence of pain while throwing. Statistical parametric mapping independent samples t-tests ($\alpha = .05$) were used to compare ten kinematic variables between groups. RESULTS: Statistical analysis revealed no significant differences between pain and pain-free groups in all kinematics examined throughout the throw ($t's < 3$, and $p's > .05$). The greatest differences were noticed near the time of maximum shoulder internal rotation with the pain group showing less elbow flexion, less shoulder internal rotation, and greater horizontal adduction. Differences were also seen in the pain group displaying less trunk flexion throughout the throw. CONCLUSION: The presence of pain did not alter catchers' throwing kinematics. These findings may be attributed to the ballistic nature of the throw and the onset of pain throughout the throw. This study provides evidence that overuse injury to catchers may be attributed to the large throwing volume imposed by the demands of the position.

P529: HAMSTRING MUSCLE FORCE SHARING DURING ISOMETRIC LEG CURLS USING SHEAR WAVE ELASTOGRAPHY

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BACKGROUND: Measuring individual muscle forces noninvasively has proven to be difficult. Fine wire electromyography (EMG) can isolate individual muscles but is invasive and measures a muscle's electrical activity which is not always linearly related to force production. Factors such as fatigue and muscle length can influence the signal. Ultrasound shear wave elastography (SWE) can non-invasively measure muscle's passive stiffness, but also possibly muscle tension. A muscle's active tension can be multiplied by its physiological cross sectional area (PCSA) to calculate individual muscle forces. METHODS: 16 healthy adults will be recruited to complete isometric leg curls at 20% of their MVIC torque with the knee flexed to 15° and the hip held at 0°, 30°, 60°, and 90° of flexion on a custom-made apparatus. Three SWE images each of the biceps femoris long head (BFlh), semitendinosus (ST), and semimembranosus (SM) will be taken at 50% of femur length at rest and while participants complete a 20% MVIC in each of the four hip angle conditions. The same will be done for the biceps femoris short head (BFsh), but at 30% of femur length, measured distally from the popliteal crease to the greater trochanter proximally. Cross-sectional panoramic B-mode images will be taken at 30% and 60% of femur length, distally to proximally, so a regression equation can be used to calculate muscle belly volume, which can then be divided by typical fascicle lengths to calculate each muscle's PCSA. The active tension (active stiffness - passive stiffness) will be multiplied by the muscle's PCSA to calculate individual muscle forces. A repeated measures ANOVA will be run to determine if the percentage of force produced by each muscle differs based on hip flexion angle. ANTICIPATED RESULTS: It is hypothesized that at higher hip flexion angles, there will be a greater contribution from the medial hamstrings due to the more optimal fiber length of the ST and SM compared to the BFlh in these positions. Understanding typical hamstring muscle forces at different joint angles can help determine which positions are most optimal for rehabilitating individual muscles, such as the ST following ACL reconstruction with a ST tendon graft.

P530: SEASONAL CHANGES IN DORSIFLEXION AND THE RELATIONSHIP TO TRAINING LOAD METRICS IN AMERICAN PROFESSIONAL SOCCER

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BACKGROUND: Dorsiflexion range of motion (DFROM) is of concern in soccer athletes due to the movement profile and ball control that requires eccentric and concentric actions at the talocrural joint. A season's demands can lead to overuse, contributing to reduced DFROM, and limb asymmetries. GPS technology quantifies training load, but specific metrics that influence overuse are unclear. The purpose of this study was to investigate how DFROM changes over a season and its relationship with different training load metrics. METHODS: 15 male United Soccer League players were tested for DFROM at preseason, midseason, and postseason. The Weight Bearing Lunge Test assessed bilateral DFROM. Wearable sensors tracked total distance covered in km, number of sprints exceeding 5.5 m/s, and number of accelerations and decelerations from 3 to 10 m/s at each session and match. Variables were averaged weekly for each player. Preseason involved training sessions and non-point matches; midseason covered matches 1-25; late season included the final seven and a half weeks. Changes in DFROM were analyzed using separate one-way repeated measures ANOVA. Pearson's product moment correlations examined relationships between variables, with significance set a priori at $p \leq 0.05$ for DFROM change and $p < 0.01$ for correlations. RESULTS: No significant main effects were found for dominant limb DFROM (8.9±2.75cm vs. 8.21±5.57cm vs. 8.11±2.89, $p=0.065$), non-dominant limb DFROM (9.33±2.31cm vs. 8.87±2.84cm vs. 8.77±2.65cm , $p=0.346$), or DFROM limb asymmetry (0.83±0.88cm vs. 1.68±1.28cm vs. 1.34±1.07cm, $p=0.053$). No significant relationships between DFROM change scores and GPS metrics were observed ($p>0.01$). CONCLUSIONS: Although statistical significance was not met, clinically significant changes to DFROM were observed. Average DFROM decreased throughout the season, and asymmetries increased by 33% from pre to midseason, with a 6% decrease by postseason. This suggests it may be beneficial to monitor DFROM throughout the season to manage injury risk. Additionally, 80-86% of participants failed to reach normative values throughout the study. Given the lack of relationship observed, total distance, number of sprints, accelerations and decelerations may not influence DFROM in professional soccer players.

P531: TOTAL SUPPORT MOMENT DURING UNILATERAL SQUAT IN INDIVIDUALS WITH HIP-RELATED PAIN

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BACKGROUND: The association between lower limb kinetics and symptom duration in individuals with hip-related pain (HRP) is not well understood. The total support moment (TSM) is a measure of the total lower limb extensor torque needed to maintain limb support and may provide information on kinetic alterations in people with HRP during activity. The purpose of this study was to analyze the effects of hip pain duration on the TSM during a single leg squat (SLS) task. **METHODS**: Involved limb hip, knee, and ankle sagittal plane moments during the SLS were obtained for 25 subjects with HRP. Subjects reported hip pain during the SLS using a verbal Numeric Pain Rating Scale and were subsequently divided into two groups based on the median duration (36 months) of hip pain. The whole-body vertical center of gravity position was used to denote the start and end of the SLS and to divide the SLS into eccentric and concentric phases. The summation of the average hip extensor, knee extensor and ankle plantarflexor moments during the eccentric and concentric phases of the SLS were used to calculate the TSM during both phases. Hip, knee and ankle joint moment contributions to the TSM were also calculated. Between-group differences in TSM-related outcomes and pain during the SLS were assessed using independent t-tests and Wilcoxon signed rank test, respectively, with significance set at the 0.05 level. **RESULTS**: The longer symptom duration group had lower average hip joint moments during both the eccentric and concentric phases of the SLS. Despite a similar TSM between both groups, subjects with a longer symptom duration exhibited a lower hip joint contribution and a higher knee joint contribution to the TSM. Subjects with longer symptom duration reported significantly higher average hip pain during the SLS. **CONCLUSIONS**: Our results suggest that the subjects

with a longer duration of HRP symptoms are placing a larger demand on the knee joint to support the lower limb in order to potentially reduce hip pain during the SLS. **Funding Sources:** NIH (K23-AT011922, K01-AG073698), American College of Sports Medicine, Mid-Atlantic Regional Chapter (MARC) Early-Stage Investigator Award, West Virginia University Research and Scholarship Advancement Grant

P532: EFFECTS OF ARM SWING ON PEAK POWER PRODUCTION DURING COUNTERMOVEMENT JUMPING IN MALE AND FEMALE WEIGHTLIFTERS

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BACKGROUND: Performing the countermovement jump (CMJ) with arm swing (AS) has been shown to increase CMJ performance compared to performance without AS (NAS); however, investigations using healthy non-athletes or jumping sport athletes report that males benefit more from AS than females. Olympic weightlifters (OWL) are power sport athletes, and while their events involve triple extension, they are not jumping sport athletes thereby possibly providing unique insight into AS CMJ augmentation sex differences. The study sought to assess sex differences of AS on peak power (PP), force at peak power (FPP) and velocity at peak power (VPP) during CMJ performed by OWL. METHODS: Female (n=25) and male (n=28) OWL national meet qualifiers (18-35yrs) completed three maximal effort CMJ with and without (akimbo) AS in a randomized order with one minute rest between trials. During each CMJ, vertical ground reaction forces were collected and used to compute PP (W/kg), FPP (N/kg), and VPP (m/s). For each outcome measure, post hoc testing of significant (P<.05) sex by AS analysis of variance effects were interpreted using 95% confidence interval differences (95% CI_{diff}). RESULTS: Males exhibited significantly greater PP than females for NAS (95% CI_{diff}=3.5-12.0, d=.97) and AS (95% CI_{diff}=11.1-28.0, d=1.2). PP with AS was significantly greater than NAS for males (95% CI_{diff}=11.6-22.1, d=1.2) but not females (95% CI_{diff}=-0.5-10.6, d=.49). Males exhibited significantly greater VPP than females for NAS (95% CI_{diff}=0.15-0.40, d=1.2) and AS (95% CI_{diff}=0.42-0.91, d=1.4). VPP with AS was significantly greater than NAS for males (95% CI_{diff}=0.30-0.64, d=1.2) but not females (95% CI_{diff}=-0.26-0.09, d=.24). For FPP, while FPP with AS was significantly greater than NAS (95% CI_{diff}=0.9-0.20, d=.66), there was no significance between the males and females (95% CI_{diff}=-0.001-0.21, d=.47). CONCLUSIONS: These results show male OWL also demonstrate greater AS CMJ performance benefits than females, thereby extending previous work in healthy adults and jumping athletes. Unique was the identification that VPP explains the greater PP by the males. The tendency of males to have greater upper extremity mass, which in turn imparts greater influence on their center of mass may explain the VPP benefit but will need to be confirmed with future research.

P533: SEMITENDINOSUS TENDON STIFFNESS VERSUS TIME AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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BACKGROUND: The anterior cruciate ligament (ACL) is one of the most commonly injured ligaments in the knee. Many anterior cruciate ligament reconstructions (ACLr) involve a graft from the semitendinosus (ST) and/or gracilis tendon. These surgeries are largely successful but often leave imbalances in tendon stiffness. Reduced tendon stiffness impacts the ability of the semitendinosus to produce force and the lengths at which it can produce force may change. Hooke's Law explains this where during an isometric contraction, muscle force is equal to tendon stiffness times the change in tendon length. Less tendon stiffness correlates to less muscle force that is able to be applied to the tendon. Changes in the functioning of the ST could impact knee joint loading. This may contribute to the high incidence of early onset osteoarthritis (OA) following ACLr. Of the known studies, ST tendon stiffness has shown to have a moderate correlation with time since ACLr or has been shown to have no significant correlation between the time post-ACLr. However, the time after surgery was mostly limited in these studies. The study objective is to see if the semitendinosus tendon stiffness of the injured limb is correlated to time since ACLr over a wider time range. METHODS: I plan to recruit 16 participants who have had a single ACLr using an ipsilateral ST tendon or ST and gracilis tendon autograft. All participants will be cleared to return to full activity and will be at least 6 months since ACLr. Ultrasound-based shear wave elastography will be used to measure ST tendon stiffness of both limbs in individuals. ANTICIPATED RESULTS: The hypothesis is that the semitendinosus tendon will not approach the contralateral tendon's stiffness the longer after ACL reconstruction has been performed. These findings will support future work to understand possible altered joint loading, and hopefully lead to eventual surgical or rehabilitation changes that can reduce rates of OA.

P534: EFFECTS OF INCLINE AND DECLINE SURFACES ON SPATIO TEMPORAL CHARACTERISTICS DURING RUNNING

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BACKGROUND: Previous investigations examining the spatio-temporal changes (STC) associated with uphill (UH) and downhill (DH) running, including ground contact time (GCT), and stride frequency (SF), have reported varying results. Additionally, step width (SW) has been suggested to influence lower extremity loading. Thus, this study aimed to compare STC, particularly GCT, SF, and SW, between UH, DH, and level running. METHODS: Healthy runners achieving at least 16.1km/wk of training for the past 6 months (12 females, 11 males) completed 60 seconds of treadmill running bouts at 90% 5K pace at 0°, ±3°, ±6°, and ±9°. Prior to data collection (>72hrs), participants completed a familiarization session to become accustomed to procedures and verify their ability to complete the targeted pace under each condition. During the data collection session, retroreflective marker clusters placed on the right and left feet were captured by a motion capture system and used to compute ground contact/off, followed by SF, SW and dominant limb GCT from 5 strides once steady state reached. Separate analysis of variance models were followed by polynomial contrasts to determine responses across conditions (+9° to -9°). RESULTS: Significant condition effects were revealed for all outcome measures (P<.002). The significant GCT quadratic trend (P<.001, d=1.0) revealed an increase from +9° to +3° (.36±.04s to .38±.05s) followed by a decrease +3° to -9° (.38±.05s to .32±.06s). The significant SF quadratic trend (P<.001, d=1.1) identified a decline from +9° to -3° (1.5±.1 to 1.4±.1 Hz) followed by an increase from -3° to -9° (1.4±.1 to 1.5±.1 Hz). A significant SW linear increase (P=.001, d=.80) existed across +9° to -9° (.04±.09 to .08±.10m). CONCLUSIONS: These results confirm some previous reports of UH to DH changes regarding GCT and SF. The current SW results suggest surface inclination could be a potent factor in lower extremity loading. Future research examining external load carry on similar characteristics is warranted.

P535: SEASONAL CHANGES IN TRAINING LOAD AND PERFORMANCE METRICS IN AMERICAN PROFESSIONAL SOCCER

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BACKGROUND: Duration of running, accelerations, decelerations, changes of direction, explosive distance, number of sprints, and sprint distance are all external training load metrics used to monitor training load to ensure proper periodization and reduce overtraining. GPS technology provides various internal and external metrics to quantify training load. Training load helps coaches and staff monitor performance and injury trends in players. Therefore, the purpose of this study was to investigate how training load metrics, and performance metrics change throughout a season in soccer players. METHODS: 15 United Soccer League players participated in the study. GPS technology was used with each GPS operating on a 10 Hertz frequency. GPS metrics were quantified for each participant at preseason (pre), midseason (mid), and lateseason(late) time points through an averaging calculation process. Preseason involved training sessions and non-point matches; midseason covered matches 1-25; late season included the final seven and a half weeks. Performance metrics included average top speed in km/h (ATS) and average metabolic power in w/kg/s (AMP). Training load metrics included average total distance in km (ATD), average high intensity accelerations (AHIA), and average high intensity decelerations (AHID) per session. Separate one-way repeated measures ANOVAs determined main effects for all measures across the three time points. RESULTS: There were significant main effects for AMP (p=0.041), ATD (p=0.003), AHIA (p<0.001), and AHID (p<0.001). Post hoc paired samples t-tests showed a significant decrease between AMP_{Pre} and AMP_{Mid} (p=0.029), and between AMP_{Pre} and AMP_{Late} (p=0.048), a significant decrease between ATD_{Pre} and ATD_{Mid} (p=0.011) and between ATD_{Pre} and ATD_{Late} (p=0.010), significant decrease between $AHIA_{Pre}$ and

$AHIA_{Mid}$ ($p<0.001$), and $AHIA_{Pre}$ and $AHIA_{Late}$ ($p=0.003$), a significant increase between $AHIA_{Mid}$ and $AHIA_{Late}$ ($p=0.011$), a significant decrease between $AHID_{Pre}$ and $AHID_{Mid}$ ($p<0.001$) and $AHID_{Pre}$ and $AHID_{Late}$ ($p=0.005$). CONCLUSION: The results of this study demonstrate the importance of tracking and monitoring GPS metrics throughout a season to observe the changes that occur and ensure proper load management is taking place to enhance performance measures, such as metabolic power.

P536: GLUCAGON-LIKE PEPTIDE-1 RECEPTOR AGONISTS AND BONE HEALTH: RESULTS FROM A PILOT RANDOMIZED CONTROLLED TRIAL

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BACKGROUND: Glucagon-like peptide-1 receptor agonist (GLP1Ra)-based therapies have garnered recent excitement due to their impressive weight loss efficacy. Their impact on the content of weight being lost, however, is not as well understood. This may be of concern among older adults where weight loss-associated bone loss is known to augment fracture risk. This project's purpose is to explore the impact of GLP1Ra-based therapy on measures of bone health loss in older adults. **METHODS:** Data come from a 20-week randomized controlled trial (NCT05786521) which enrolled 20 older adults with a BMI ≥27 kg/m^2 and hemoglobin A1c ≥5.7%. Participants were allocated to a combination of 1.0 mg/weekly semaglutide + lifestyle counseling ("intervention"; n=10) or lifestyle counseling alone ("control"; n=10). Total body weight, DXA-acquired total body areal bone mineral density (aBMD), and blood-based biomarkers of bone turnover [C-terminal telopeptide of type 1 collagen (CTX), and procollagen type I N-propeptide (P1NP)] were measured at baseline and 20-weeks. Change in group means and 95% confidence intervals (95% CI) were estimated using a general linear model adjusted for age, sex, and baseline values of the respective outcome. **RESULTS:** At baseline, participants were 72.7±4.9 years of age, 50% women, 45% Hispanic, and living with obesity (BMI: 32.9±3.9 kg/m^2). After 20-weeks, the intervention group experienced greater weight loss than control [-5.2 kg (95% CI: -6.8, -3.5) vs. -0.8 kg (95% CI: -2.5, 0.9); p=0.002]. Likewise, the intervention group experienced greater total body aBMD loss than control [-0.11 g/cm^2 (95% CI: -0.2, -0.1) vs. +0.02 g/cm^2 (95% CI: -0.6, 0.09); p=0.029]. No differences in biomarkers of bone turnover were observed in the intervention group [CTX: +0.23 ng/mL (95% CI: -0.40, 0.86); P1NP: +0.6 ng/mL (95% CI: -14.9, 16.2)] or control group [CTX: -0.08 ng/mL (95% CI: -0.71, 0.54); P1NP: -0.6 mg/mL (95% CI: -16.1, 15.0)]; CTX: p=0.80, P1NP p=0.91. **CONCLUSIONS:** Pilot data show older adults allocated to semaglutide + lifestyle intervention lose significantly more weight and total body aBMD compared to lifestyle alone. Biomarkers of bone turnover were unchanged from baseline; however, large variability was noted.

P537: COMPARISON OF TOTAL BODY AND THIGH MINERAL-FREE LEAN MEASURES USING DXA IN YOUNG CHILDREN

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BACKGROUND: Total body composition assessment using MRI or CT scan can provide both quantitative and qualitative assessment of tissue masses; however, they are cost, time and safety prohibitive. Alternatively, cross-sectional slices of the thigh using these MRI- or CT-based techniques have previously been used to represent baseline and changes in skeletal muscle mass due to training, treatment, and rehabilitation strategies. More recently, the total body mineral-free lean mass (MFLM) measures via DXA scanning have been used to quantitatively represent total skeletal muscle mass despite known assumption violations and an inability to distinguish among skeletal muscle mass, viscera and fluids. Since uniquely created regions of interest (ROIs) are possible with DXA scanning, the purpose of this study was to determine if there is a significant association between total body and thigh MFLM (which contains no viscera) using DXA scanning in young children. **METHODS:** We enrolled and tested 75 (36 boys) children 5-11 years (Mean ± SD: 8.9 ± 1.8 yrs) of age. Total body DXA scans were acquired for each participant. Subsequently, a single trained investigator used the DXA custom analyses software to analyze the right thigh MFLM twice and the mean of the measurements was used for final analyses. **RESULTS:** Total thigh MFLM (2.95 ± 1.1kg) explained 97.4% of the variance in total body MFLM (23.4 ± 7.1kg). **CONCLUSIONS:** The unique ROIs analyses demonstrated a strong association between total thigh and total body MFLM confirmed by the significant explained variance. Based on these results, total thigh MFLM may be considered a useful predictor of total body MFLM, and conversely total body MFLM may more confidently be used to represent total body skeletal muscle mass in young children. This study was supported in part by the University of Kentucky Pediatric Exercise Physiology Laboratory Endowment.

P538: COMPARING CARDIOVASCULAR AND METABOLIC PROFILES OF MORNING AND EVENING CHRONOTYPES IN YOUNG ADULTS

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BACKGROUND: Circadian rhythm is the process that regulates the sleep-wake cycle in our bodies, repeating approximately every 24 h. This process controls various physiological processes, but when disrupted, can lead to cardiovascular (CV) and metabolic dysfunction and disease. Chronotype refers to the behavioral manifestation of circadian rhythm, reflecting when an individual feels high or low energy during the day. Individuals can be broadly categorized into the morning chronotype (wake up early and feel most alert in the morning) or evening chronotype (stay up late and perform best in the evening). Growing evidence suggests that evening chronotype is associated with higher cardiometabolic risk in middle-aged and older adults, but far less is known about this relationship in younger adults. Furthermore, many studies on this topic lack a comprehensive evaluation of health using objectively (device) measured outcomes, and do not account for potentially mediating factors. To address these gaps, our study will investigate the influence of chronotype on CV and metabolic health indices in a sample of young adults and examine whether these differences are mediated by factors such as sleep and physical activity (PA) level. **METHODS**: 68 young adults (18-40 y) will be recruited and stratified into two groups, morning chronotype and evening chronotype (n=34/group), using the Morningness-Eveningness Questionnaire. Anthropometrics (height, weight, waist circumference, body composition), and indices of cardiometabolic health, including resting brachial and central blood pressure (BP), arterial stiffness, and fasted cholesterol and glucose levels will be measured. Participants will then leave the laboratory wearing an ambulatory BP monitor and ActiGraph to measure BP, PA levels, and sleep for the following 24 h. Descriptive statistics (mean ± standard deviation) will be generated for all outcome measures. Independent t-tests, multivariate linear regression, and mediation analyses will assess associations between chronotype, cardiometabolic health outcomes, and mediating factors. **ANTICIPATED RESULTS**: We hypothesize that evening chronotypes will exhibit greater cardiometabolic risk compared to morning chronotypes, with sleep and PA levels mediating these differences.

P539: THE RELATIONSHIP BETWEEN DIABETIC AND INFLAMMATORY MARKERS IN FIREFIGHTERS

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BACKGROUND: Firefighters are at risk for metabolic diseases such as Type 2 diabetes due to occupational-related stress and resulting health behaviors such as lack of sleep and poor dietary patterns. Firefighters often experience chronic inflammatory responses that may contribute to insulin resistance development. This study aimed to determine the correlation between insulin resistance and inflammatory markers in firefighters. **METHODS:** 20 male full-time firefighters participated in this cross-sectional, correlational study. After fasting for at least 8 hours, participants had their blood drawn for subsequent analysis of circulating C-reactive protein (CRP), homocysteine, hemoglobin A1c

(HbA1c), glucose, and insulin. The fasting glucose and insulin were used to estimate HOMA-IR. Separate Pearson partial correlation analyses were used to determine the relationships between markers of systemic inflammation (C-reactive protein and homocysteine) and indicators of diabetes [HOMA-IR and HbA1c] while controlling for body fat percentage (BF%) and Age (in years). SPSS version 29 was used for all analyses (α = 0.05). Data transformation was used where appropriate to ensure normal distribution of each variable. **RESULTS:** There was a significant direct relationship between homocysteine and HbA1c before (strong) and after (moderate) controlling for Age and BF% (p = 0.004, r = 0.649; p = 0.027, r = 0.552). The relationship between homocysteine and HOMA-IR was weak and non-significant and remained so after controlling for Age and BF% (p = 0.898, r = -0.032; p = 0.413, r = -0.220). The relationships between CRP and the variables HOMA-IR and HbA1c were weak and non-significant (p = 0.585, r = -0.138; p = 0.503, r = -0.169), and remained so after controlling for Age and BF% (p = 0.432, r = -0.211; p = 0.249, r = -0.306). **CONCLUSION:** Homocysteine and HbA1c were directly related among this sample of firefighters. Future large-scale studies are needed to establish the contribution of inflammatory markers to insulin resistance. Finding effective and feasible interventions to enhance this population's metabolic and cardiovascular health will require more investigation.

P540: EFFECTS OF VAGAL NERVE STIMULATION ON BLOOD PRESSURE REACTIVITY IN WOMEN WITH RHEUMATOID ARTHRITIS

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BACKGROUND: Rheumatoid arthritis (RA) is a chronic inflammatory disorder characterized by progressive joint damage. Literature suggests that individuals with RA are at a greater risk of hypertension and thus cardiovascular disease (CVD). Assessment of blood pressure reactivity (BPR) may predict this increased risk. Further, alternative treatments such as transcutaneous vagal nerve stimulation (tVNS) may reduce BPR in RA. However, the effects of tVNS on BPR have yet to be reported. Therefore, the purpose of this study is to investigate the effects of tVNS on BPR in women with RA. **METHODS:** Three women diagnosed with RA (51 ± 4.7 years) volunteered to participate. BPR was assessed using the cold pressor test (CPT) at baseline and post tVNS. During the CPT, the participant's hand was submerged into ice water (4-6° C) while both systolic blood pressure (SBP) and diastolic blood pressure (DBP) were manually measured at 30 and 60 seconds. The highest values were recorded. Following, participants performed daily tVNS treatment for 10 days. The tVNS consisted of 20 minutes of stimulation using an earbud (Xen) paired to a mobile phone application (Neuvana). Significant differences between SBP and DBP during CPT at baseline and post tVNS were determined using Wilcoxin Signed Rank Tests. Significance was accepted *a priori* $p<0.05$. **RESULTS:** There were no significant differences ($p>0.05$) between baseline and post tVNS for SBP (baseline= 136±21mmHg, post tVNS=135±14mmHg, p=0.66) or DBP (baseline=91±29mmHg, post tVNS= 93±23mmHg, p=0.59) during the CPT. **CONCLUSIONS:** Preliminary findings suggest that tVNS does not have a significant effect on BPR in women with RA as demonstrated by the CPT. However, a larger sample size is necessary to support these findings.

P541: ESTIMATING PROXIMITY TO FAILURE USING PERCEIVED REPETITIONS IN RESERVE IN ADULTS TREATED FOR BREAST CANCER AND LONGITUDINAL TRENDS

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BACKGROUND: Governing bodies emphasize the need for more evidence on how to effectively monitor and progress resistance training (RT) in oncologic populations. Repetitions in reserve (RIR) has been demonstrated as a quick tool to monitor proximity to failure and has demonstrated promise in improving muscle strength and mass in older adults and healthy populations. However, the validity of RIR for monitoring RT in oncologic populations remains unexplored. The purpose of this study was to assess the accuracy of RIR predications in individuals treated for breast cancer (BC). METHODS: Nine individuals (mean age 63.8 ± 8.9 years; height 64.6 ± 2.6 inches; weight 167.4 ± 35.3 lbs.) treated for BC participated in an 8-week RT intervention. The cohort was 50% Black and 50% White, non-Hispanic. RIR testing sessions at weeks 2 and 8 of the study, where participants estimated their 2 RIR before completing repetitions until momentary failure. Generalized linear mixed models (GLMM) were performed on both relative and absolute RIR difference values and a binary logistic regression (BLR) was performed on number of successful predictions. All statistical analyses were performed in R. RESULTS : The raw difference of RIR predictions at baseline was -2.24 repetitions and -1.46 at follow up. Results of the GLMM analysis revealed time had negligible effects on relative RIR values, (Estimate = -0.438, p =0.48), overall mean raw RIR was 5.37 (95% CI [4.00-6.74], p < 0.001). For absolute RIR values, time had no significant effect on predictions (Estimate= 2.42e-06, p=1.00), with mean predicted value of 2.1 (95% CI [1.05, 3.14], p < 0.001). The BLR demonstrated negligible effects on probability of accurate predictions (within ±2 of actual RIR) across time (Estimate = 4.68e-07, p = 1.00), there was no significant time by movement interaction. The mean predicted probability for a successful RIR prediction was 0.616 (95% CI [0.346, 0.886], p < 0.001), thus probability did not change across the intervention. CONCLUSIONS: Preliminary analysis showed individuals with BC consistently misestimated their RIR by ~2, with no statistically significant change in accuracy across 8-weeks of training. We are continuing to collect data and expect a sample size of n = 20 by the end of Fall 2024 and will present the analysis of this data at the SEACSM conference.

P542: PRE-SEASON AND POST-SEASON ANALYSIS OF BODY COMPOSITION IN NJCAA FEMALE ATHLETES

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BACKGROUND: Changes in body mass index (BMI), body fat percentage (BF%) and waist circumference (WC) have been previously investigated in college students. It has been documented that within the first year of college, students typically show increases in BMI, BF% and WC. However, in NCAA athletes it has been found that there were no significant differences in BMI and BF% between the pre-season and post-season. The purpose of this study was to assess potential differences in BMI, BF% and WC between the pre-season and off-season in NJCAA female student-athletes. METHODS: Ten NJCAA female student-athletes from a commuter-based, two-year university participated in a study in the pre-season and off-season. Height (cm), weight (kg), BF% and WC (cm) were measured, and BMI was calculated. Body composition was assessed using tetrapolar bioelectrical impedance analysis (RJL Systems Quantum X). WC were taken at the narrowest part of the trunk between the xiphoid process and the umbilicus in triplicate. A repeated measures 2x3 ANOVA was used to determine if differences existed between pre-season and post-season body composition values. The level of significance was set at $p<0.05$. RESULTS: No significant differences were found between the pre-season and post-season in BMI (22.53 ± 1.89 kg/m^2 vs 22.76 ± 1.94 kg/m^2), BF% (29.67 ± 4.03% vs 29.52 ± 2.95%), and WC (68.19 ± 3.17cm vs 69.14 ± 4.22cm), Wilks' lambda = .817, F (3, 7) =.524, p = .680. CONCLUSIONS: Previous studies on first year college students have shown increases in BMI, BF% and WC. However, there were no significant differences in the current sample of NJCAA female athletes. It is assumed that athletes have heightened physical activity due to sports specific training which could help prevent the typical weight gain experienced by a first-year college student. Future research would be enhanced by adding a nonathletic control group and increasing the current sample size. Supported by the Research and Productive Scholarship Grant.

P543: ASSOCIATIONS AMONG MODERATE TO VIGOROUS PHYSICAL ACTIVITY, HANDGRIP STRENGTH, AND FAT FREE MASS INDEX

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BACKGROUND: Fat free mass index (FFMI) has been proposed as an accurate measure of body composition to be used as a standard for muscle mass. Influences in determining muscle mass are a person's physical activity levels and their overall body strength. The purpose of this study was to determine if associations exist among moderate to vigorous physical activity (MVPA), handgrip strength, and FFMI in female NJCAA athletes. METHODS: Thirteen female NJCAA student athletes from a rural 2-year commuter campus were recruited to participate in this study. Anthropometric measures (height, weight, circumferences) were recorded, and handgrip strength was assessed (Jamar dynamometer). Tetrapolar Bioelectrical Impedance Analysis (RJL Systems Quantum X) was used to assess body composition.

Participants were asked to wear a GT3X ActiGraph accelerometer during waking hours for 7 days, excluding sleeping, swimming, or bathing. Pearson r correlational analyses were used to determine possible associations among MVPA, handgrip strength, and FFMI. Significance was set at $p<0.05$. RESULTS: A correlational analysis was performed between FFMI, MVPA, and handgrip strength. No statistically significant correlation was found between handgrip strength and FFMI, $r(12)=0.111$, $p=0.718$ or between FFMI and MVPA, $r(12)=0.514$, $p=0.072$. DISCUSSION: A moderately strong relationship between FFMI and MVPA, although not significant, was found in this population. The data showed that while the minimums for MVPA were met, the minimum standard for a recommended FFMI were not met. This indicates that college age women, athletic or not, would benefit from higher levels of strength training. Previous studies have reported no relationship between FFMI and MVPA in non-athletic adult women. However, our lack of significance between these two variables is most likely due to a relatively small sample size. Supported by the Research and Productive Scholarship Grant.

P544: THE EFFECTS OF EXERCISE TRAINING ON 10-YEAR ASCVD PREDICTED RISK ACROSS FOUR EXERCISE TRIALS

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BACKGROUND: The pooled cohort equations (PCE) estimate sex- and race-specific 10-year atherosclerotic cardiovascular disease (ASCVD) risk using information on age, systolic blood pressure, and HDL and total cholesterol. Although exercise training has shown to have a dose-response effect on cardiovascular risk factors, the effects of exercise dose or mode on predicted ASCVD risk has not been well studied. METHODS: Data from three STRRIDE (Studies of Targeted Risk Reduction Interventions through Defined Exercise) exercise trials that differed in exercise amount and intensity, or exercise mode were analyzed. STRRIDE 1 and 2 participants were overweight individuals with mild dyslipidemia that completed 8 months of the following interventions: STRRIDE 1 (n=181) - low-amount, moderate-intensity (LOW/MOD); low-amount, high-intensity (LOW/HIGH); or high-amount, high-intensity (HIGH/HIGH); STRRIDE 2 (n=70) - aerobic training (AT), resistance training (RT), or combined (AT+RT) exercise training. STRRIDE-PD (n=153) participants were individuals with pre-diabetes who completed one of four exercise interventions for 6 months: (1) LOW/MOD; (2) HIGH/MOD; (3) HIGH/HIGH; or (4) LOW/MOD + Diet. 10-year ASCVD risk was calculated using the PCE at baseline and after training. Paired t-tests within each group were performed to assess the effects of exercise training on risk. Significance was defined as $p<0.05$. RESULTS: At baseline, mean 10-yr ASCVD risk was 4.2%, 3.8%, and 7.1% in STRRIDE 1, STRRIDE 2, and STRRIDE PD, respectively. An increase in age only over the intervention periods would significantly increase 10-year risk across all groups ($p<0.0001$). When age was held constant, exercise training significantly decreased 10-year risk in STRRIDE 1 HIGH/HIGH (-0.39%), STRRIDE 2 AT+RT (-0.26%), STRRIDE PD LOW/MOD + Diet (-0.79%), and STRRIDE PD HIGH/HIGH (-0.85%). The true change in 10-yr risk, including changes in both age and traits, significantly decreased only in STRRIDE 1 HIGH/HIGH (-0.24%). Conclusions: Although ASCVD risk continuously increases with age, our results suggest that a variety of exercise interventions can negate this effect. Importantly, a combination of high amount and high intensity exercise training may decrease ASCVD risk even further for overweight and mildly dyslipidemic individuals.

P545: ESTIMATING AEROBIC CAPACITY IN ELITE WOMEN BASKETBALL ATHLETES: ARE NON-EXERCISE EQUATIONS VIABLE?

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Basketball requires high levels of anaerobic and aerobic capacity. Field tests can evaluate aerobic capacity in intermittent team sport athletes; however, there is limited normative data for elite women. Our purpose was to compare aerobic capacity estimates from field tests to non-exercise prediction equations in elite basketball athletes. METHODS: Ten female Division I NCAA basketball athletes volunteered to participate. Yo-Yo intermittent shuttle run or one mile run (MR) were completed. Two equations estimated VO_{2max} from MR: $VO_{2Peak} = 7.34 \times (1 \text{ MR speed in } m \cdot s^{-1}) + 0.23 \times (age \times [0=Female, 1=Male]) + 17.75$ (Burns et al. 2015) and $VO_{2max} = (-8.41 \times MR \text{ in min}) + (0.34 \times MR \text{ time}^2) + (.21 [age \times [0=Female, 1=Male]]) - (0.84 \times BMI) + 108.94$ (Cureton et al. 1995). Non-exercise VO_{2max} prediction equation (Bradshaw et al. 2005) was used: VO_{2max} ($ml \cdot kg^{-1} \cdot min^{-1}$) = 48.0730 + (6.1779 x gender) - (0.2463 x age) - (0.6186 x BMI) + (0.7115 x PFA) + (0.6709 x PA-R), with PFA (perceived functional ability) and PA-R (Physical Activity Rating for past 6 months) and a second non-exercise VO_{2max} prediction equation for physically active college students (George et al. 1997) including BMI. Heart rate (HR) was obtained during tests and 20 min of game play using Polar H10. RESULTS: Peak HR during MR and Yo-Yo were 197±7 and 195±7 bt/min, respectively, which were not different ($p = 0.20$) than peak HR during game play (189±9 bt/min) or age-predicted HR_{max} (201±1 bt/min). Although VO_{2max} estimate from Yo-Yo was highly correlated to MR ($r=0.75$; $p=0.012$), predicted VO_{2max} for MR resulted in higher values by ~8 $ml \cdot kg^{-1} \cdot min^{-1}$ using either Cureton (47.9 ± 3.1) or Burns (47.0 ± 2.0). VO_{2max} was also significantly lower ($p < 0.001$) for Yo-Yo (39.8 ± 5.5 $ml \cdot kg^{-1} \cdot min^{-1}$) compared to the non-exercise equations of George and Bradshaw (46.5 ± 2.6 and 49.1 ± 2.2 $ml \cdot kg^{-1} \cdot min^{-1}$, respectively), which also differed ($p < 0.001$) from each other. CONCLUSION: For elite female collegiate basketball players, non-exercise estimates of VO_{2max} yielded values in agreement with a 1 mile run test but not compared to Yo-Yo field test, which underestimated VO_{2max} and tended to result in lower peak HR. Despite the popularity of the Yo-Yo test, the mile run may be a more practical alternative as a field test in elite female basketball athletes.

P546: IMPACT OF ONE NIGHT OF EARLY SLEEP RESTRICTION ON SUBSEQUENT AEROBIC PERFORMANCE AND PERCEPTION

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Sleep plays a critical role in maintaining health and overall well-being. Insufficient or poor-quality sleep has been shown to negatively impact performance and perception of exercise; however, most research has focused on multiple days or more of poor or no sleep. What is less understood is the impact of a single night of sleep restriction (SR), which athletes may experience the night before important events. **PURPOSE:** To examine the effect of one night of early SR (delayed sleep initiation) on performance and perception of subsequent day cycle exercise compared to normal sleep (NS). **METHODS:** Thirteen active subjects (7 females, 6 males, age = 21.0 ± 1.2 yr; VO_{2max} = 37.0 ± 9.6 $mL \cdot kg^{-1} \cdot min^{-1}$) completed 3 performance trials (1 familiarization and 2 experimental) on a cycle ergometer. Trials consisted of a 20-minute steady-state (SS) bout at 50% of maximal workload and a 3-kilometer time trial (TT). Experimental trials were performed after NS (6 - 8 hours) or SR (3 hours, initiating sleep at 3:00 am). Order of experimental trials was randomized. Diet was replicated prior to each trial. Sleep condition was confirmed via smartphone app. Ratings of sleepiness, fatigue, exertion, and exercise enjoyment were obtained under each condition. **RESULTS:** Participants reported significantly higher levels of sleepiness (7.4 ± 1.2 vs. 4.6 ± 1.9; $P < 0.001$) and fatigue (6.4 ± 1.5 vs. 3.2 ± 1.6; $P < 0.001$) under SR condition compared to NS. Exercise enjoyment was lower with SR (64.9 ± 20.2 vs. 74.0 ± 14.1; $P = 0.03$). There was no significant difference in TT finish time between conditions (6.7 ± 0.8 minutes for SR vs. 6.8 ± 0.9 minutes for NS; $P = 0.6$). Mean power output, oxygen consumption, or heart rate did not differ. During the SS trial, perceived exertion was higher with SR (12.9 ± 2.7 vs. 11.7 ± 2.8; $P = 0.007$), while the respiratory exchange ratio was lower (0.91 ± 0.03 vs. 0.93 ± 0.03; $P = 0.007$). Heart rate and oxygen consumption did not differ. CONCLUSION: Results suggest that a single night of SR does not significantly impair near-maximal exercise performance, such as during a TT, but may affect substrate utilization at lower intensities. SR also increases fatigue, sleepiness, perceived exertion, reducing exercise enjoyment and potentially leading to performance deficits in longer duration activities. Further research is needed.

P547: THE EFFECTS OF DIVERGENT RESISTANCE TRAINING ON MAXIMAL STRENGTH, ELECTROMYOGRAPHIC BEHAVIOR, AND ABSOLUTE MUSCULAR ENDURANCE

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Purpose: To compare the effects of 6 weeks of combined high- and low-load lower body resistance training (H+L) to high-load only training (H) on maximal strength and electromyographic amplitude (EMG_{RMS})-torque relationships of the vastus lateralis (VL) during an absolute muscular endurance (AME) task. **Methods:** 28 healthy untrained men (age = 24 ± 5 yrs) were randomized into H (n = 14) and H+L. Before (PRE) and after (POST) training, participants performed maximal isometric voluntary contractions (MVCs) of the knee extensors on a dynamometer followed by submaximal trapezoidal contractions to failure (AME) at the same absolute 50% MVC as PRE. Surface EMG signals were collected from the VL. *b* (slopes) terms were calculated from the log-transformed EMG_{RMS}-torque relationships during the linearly increasing (LI) and decreasing (LD) segments of the first and last contraction completed. Steady torque EMG_{RMS} was normalized (N-EMG_{RMS}) to testing MVC. 2-way mixed factorial repeated measures (RM) ANOVAs (group x time) were performed for MVC and number of contractions completed. A 4-way mixed factorial RM ANOVA (group x time x contraction x segment) was used for *b* terms. A 3-way mixed factorial RM ANOVA (group x time x contraction) was used for N-EMG_{RMS}. **Results:** For MVC, there was a main effect for time (p < 0.05). MVC increased at POST when collapsed across groups (p < 0.05). For contractions completed, there was a 2-way interaction (p < 0.05). H+L increased the contractions completed at POST (p < 0.05). For the *b* terms, there was a time x contraction x segment interaction (p < 0.05). The *b* terms during the LD segment of the first contraction and LI segment of the last contraction decreased from PRE to POST when collapsed across groups (p < 0.05). For N-EMG_{RMS}, there was only a time x group interaction (p < 0.05). Only H+L decreased N-EMG_{RMS} at POST when collapsed across contractions (p < 0.05). **Conclusion:** Despite similar increases in MVCs, only H+L improved their AME while requiring less input excitation at steady torque, thus, supporting adaptations to imposed demands. The changes in *b* terms suggest less excitation was necessary to match targeted torque during the LD and LI segments of the first and last contraction, respectively, and were independent of group, suggesting strength improvements influenced excitation during force modulation.

P548: INFLUENCE OF POST-ACTIVATION POTENTIATION RECOVERY TIME ON JUMP PERFORMANCE IN RESISTANCE TRAINED FEMALES.

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BACKGROUND: Research on post-activation potentiation enhancement (PAPE) has primarily focused on acute settings, often involving males, mixed-gender cohorts, or untrained individuals. Key factors such as conditioning exercise selection, intensity, and neuromuscular status influence PAPE, but the optimal recovery period between conditioning and explosive exercises remains unclear, particularly in recreationally-trained (REC) females. Few studies have explored PAPE in trained females, with most either combining male and female data or focusing on untrained women. Only two studies in trained female athletes (AT) have shown PAPE responses peaking at 2 min and diminishing after 5 min. As a result, it remains uncertain the optimal recovery period for trained women, and whether a resistance training (RT) program would effectively elicit PAPE in REC females as observed with AT. This study aims to address this gap by investigating the optimal recovery period for PAPE in REC females following a RT program, compared to AT females. **METHODS:** Two groups of females (REC, AT) will be recruited. Both groups will undergo two testing sessions, separated by 48-72 hrs. The first session will assess maximal strength (1RM) in the barbell back squat (BS). The second will evaluate PAPE with a countermovement jump (CMJ) before (baseline, BL) and after 5 sets of 3 squats at 85% of 1-RM. CMJ tests will be conducted at BL and at 0, 2, 4, 6, 8, and 15 min post-BS, with jump height (JH) and reactive strength index (RSI = JH / ground contact time, GCT) measured. The REC group will then complete a 5-wk RT program. Following the 5-wk program, both groups will repeat the 1RM and PAPE assessments to evaluate the effects of training on recovery times and PAPE responses. **STATISTICAL ANALYSIS:** Independent t tests will be used to determine if groups differ from each other prior to formal training interventions for 1RM, JH, GCT, and RSI. Repeated measures analysis of variance (ANOVA) will be used to compare dependent variables from BL and 0, 2, 4, 6, 8, and 15 min post-BS for each group. **ANTICIPATED RESULTS:** It is hypothesized that before the 5-wk program, the AT group will exhibit a greater PAPE response within 2-5 min post-BS. After the intervention, no significant differences between groups are expected.

P549: BODY COMPOSITION DIFFERS BY POSITION IN NCAA DIVISION I MALE AND FEMALE SOCCER PLAYERS

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Player positions in soccer may vary based on athletic, physical, and technical factors. One physical characteristic that differs between positions is body composition (BC). However, position-specific differences in BC among NCAA Division 1 (D1) male and female soccer players has yet to be fully elucidated. Therefore, we assessed differences in BC across goalkeepers (GK), defenders (D), midfielders (M), and forwards (F) in both male and female DI NCAA soccer players. Male (n = 29; GK = 2, D = 7, M = 12, F = 8; age = 21.3 ± 1.9y) and female (n = 34; GK = 4, D = 12, M = 11, F = 7; age = 20.4 ± 1.4y) DI NCAA soccer players underwent BC assessment prior to preseason training. Height and body mass (BM) were assessed along with body fat percentage (BF%) and fat-free mass (FFM) via BOD POD (COSMED, CA, USA). ANOVAs were used to evaluate effect of position on BC, height, and BM with Holm-corrected post hoc tests when significant main effects (P < 0.05) were found. Effect sizes were also calculated. Main effects of position were found for males on FFM (P = 0.01) and for females on BF% (P = 0.01), with no significant effects for height, BM, or any other variable in males or females (P > 0.05). In males, D exhibited greater FFM than M (P < 0.01, ES = 1.70). In females, GK and M exhibited greater BF% than F (P = 0.02, ES = 1.54 and P = 0.03, ES = 1.10, respectively). Males and females exhibited similar absolute variability in FFM (70.8 ± 5.8kg vs. 51.5 ± 5.4kg, respectively) and BF% (10.0 ± 4.1% vs. 21.9 ± 4.1%, respectively), indicating greater relative variability in males. While differences in height and BM were not significant, Male D exhibited greater FFM than M, likely due to the larger overall statures favored in this position. BF% differences between female GK and F and M may reflect position-specific demands for speed and distance covered. Positional differences in BC may reflect position-specific training, and selection bias by the players and/or coaches. While both teams exhibited similar variance in FFM and BF%, females had relatively less variability in BF% and more variability in FFM. Future research should assess position- and sex-specific differences in BC, height, and BM across more D1 NCAA soccer teams to inform training prescriptions and position selection. This abstract was made possible in part by Grant Number T32-GM081740 from NIH-NIGMS, awarded to GFM.

P550: A HIGH PERCENTAGE OF HEALTHY VOLUNTEERS FAIL TO PASS CRITERIA-BASED RETURN-TO-SPORT TESTING FOR ARTHROSCOPIC BANKART REPAIR

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BACKGROUND: The rate of recurrent shoulder instability following return to sport (RTS) after Bankart repair remains unsatisfactory. This has led to the establishment of criteria-based return to sport (CBRTS) protocols which help providers determine if athletes are ready to return to their previous level of activity. However, there is a lack of evidence supporting passing thresholds for CBRTS protocols. This study aims to evaluate whether healthy volunteers can pass a previously published CBRTS protocol. **METHODS:** Conducted in March 2024, this study included 26 volunteers with no history of upper extremity injury or surgery. Volunteers were assessed according to a published CBRTS protocol: (i) isometric testing of external rotation (ER) and internal rotation (IR) in the supine and prone position assessed by hand-held dynamometry; (ii) isokinetic strength testing of ER and IR assessed by isokinetic dynamometry; (iii) endurance testing of side lying ER, prone ER, and prone Y test; and (iv) functional testing via closed kinetic chain upper extremity (CKCUE) stability test and unilateral shot put test. A limb symmetry index (LSI) and proportion of volunteers that passed each test were calculated. A passing LSI value was defined as LSI within 10% of the contralateral side, except for the shot put test, for which a passing value was defined as 80% ≤ LSI ≤ 110%. A passing score for the CKCUE stability test was ≥ 21. **RESULTS:** The proportion of the 26 participants that passed isokinetic testing ranged from 30.8% to 57.7%. For isometric testing, passing ranged from 46.2% to 69.2%. For endurance testing, passing ranged

from 19.2% to 30.8%. 50% of participants passed the CKCUE stability test, while 96.2% passed the unilateral shot put test. A non-dominant arm deficit was apparent in 10 of the 12 bilateral arm tests.**CONCLUSION:** A high percentage of healthy individuals are unable to pass post-Bankart repair CBRTS protocol tests. Clinicians should consider these findings when using CBRTS testing for athletes after Bankart repair. The benchmark LSI should be practical while still protecting against recurrent instability

P551: ANALGESIC EFFECTS OF CBD AND CAFFEINE ON PERCEPTUAL RESPONSES TO BLOOD FLOW RESTRICTION TRAINING

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Blood flow restriction (BFR) is a technique where venous blood flow in a person's arm(s) or leg(s) is occluded proximally during exercise, resulting in positive physiologic changes in the muscle at a lower intensity of training. However, BFR training does include side effects such as tingling, delayed onset muscle soreness, and excessive pain during exercise in the limb being occluded. The purpose of this study was to investigate the analgesic effects of caffeine (CAF) and cannabidiol oil (CBD) on tolerance to BFR training in both hot (HOT) and moderate (MOD) environments. Fourteen participants reported to the lab on six occasions with a minimum 48 hr recovery between trials. Participants were instructed to walk on a treadmill for 30 minutes at 3.3 mph and 1% grade. During the trials, individuals completed three rounds of BFR lasting 7.5 min followed by a 2.5 min active recovery. Throughout the trial lactate, HR, blood pressure, and RPE were recorded every five minutes. Following each trial, participants remained in the lab for a 15-min seated recovery after which they estimated session RPE (SRPE) using the same OMNI scale. Participants also completed a post-trial 10-point Likert scale questionnaire that assessed perceptual markers of fatigue, mood, nervousness, restlessness, presences of tremors, stomach distress, and overall feeling. Results indicated main effects for RPE [condition ($p=0.016$); timepoint ($p<0.001$)], HR [condition ($p<0.001$); timepoint ($p<0.001$); interaction condition x timepoint ($p<0.001$)], systolic BP [timepoint ($p<0.001$)], diastolic BP [treatment ($p=0.044$); timepoint ($p=0.034$)], lactate [treatment ($p<0.001$)], SRPE [condition ($p<0.001$)], perceived recovery [treatment ($p=0.007$); condition ($p=0.051$); interaction treatment x condition ($p=0.007$)], environmental temperature [treatment ($p=0.025$); condition ($p<0.001$)], environmental humidity [condition ($p<0.001$)], fatigue [condition $p=0.025$)], nervousness [treatment $p=0.035$)], restlessness [treatment $p=0.054$)], and tremors [treatment $p=0.005$)]. Results indicate CAF and CBD show beneficial analgesic properties and may improve tolerance to BFR training, thus resulting in better training outcomes. However, caution should be observed as caffeine did demonstrate an increase in nervousness, restlessness, and tremors.

P552: EFFECT OF HIGH-INTENSITY FUNCTIONAL TRAINING COMBINED WITH A RESPIRATORY MUSCLE TRAINING DEVICE ON BLOOD LACTATE

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High-intensity functional training (HIFT) is characterized by short duration, high-intensity exercise bouts that produce high levels of blood lactate (BL). Respiratory muscle training (RMT) devices increase resistance of breathing, inducing hypercapnia, which may improve lactate buffering capacity during a bout of high-intensity exercise. Therefore, this study aimed to determine the effects of HIFT combined with an RMT device on BL following a maximal anaerobic exercise test. Twenty recreationally active adults (Age = 22.6 ± 2.1y; BMI = 24.1 ± 3.4kg/m2) were randomized into two separate training groups with (RMT; M = 6, F = 4) and without (CON; M = 6, F = 4) an RMT device. Training consisted of three 30-minute HIFT sessions per week for six weeks. Each session consisted of four rounds of six HIFT exercises using a 30:30-second work-to-rest ratio, with 2.5 minutes of rest between rounds. Pre- and post-testing consisted of an 18-minute, self-paced, maximal bodyweight HIFT test consisting of rounds of 10 inverted rows, 5 pushups, and 15 squats. Number of rounds completed (RC), ratings of perceived exertion (RPE), and BL were collected immediately before and after the maximal HIFT test on both testing days. A repeated measures ANOVA was conducted to assess effects of the intervention, while an ANCOVA, using RC as the covariate, assessed BL responses ($\alpha = 0.05$) with effect sizes calculated to determine the magnitude of difference between groups.
HIFT increased RC ($P < 0.001$, ES = 1.14) with no differences between groups. When accounting for RC, both groups decreased BL ($P = 0.047$, ES = -0.23), with a lower BL observed in CON across all timepoints ($P = 0.031$, ES = -0.23). There were no time or group effects for RPE.
Six weeks of HIFT improved RC and lowered BL, suggesting that HIFT enhances functional exercise capacity with no added benefit of the RMT device. Future research should investigate the impact of RMT devices on lactate handling during aerobic exercise to determine its potential effects on aerobic performance.
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P553: IMPACT OF PREVIOUS INJURY AND PAIN ON ANKLE RANGE OF MOTION AND Y-BALANCE TEST PERFORMANCE

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Clinicians use assessments to determine how load compromised athletes can withstand additional stress in order to decide capability of returning to play. For lower extremity injury, such assessments include the Lower Quartile Y-Balance Test (YBT-LQ), range of motion (ROM) analysis, and electromyography (EMG) assessments. The YBT-LQ assesses dynamic postural control and has been found to predict lower-limb injury risk. Additionally, research has found that YBT-LQ scores are affected by dorsiflexion and plantarflexion ROM. Adding lower extremity muscle activity alongside YBT-LQ scores and ankle ROM will allow us to better understand the response of a load-compromised athlete to pain and previous injury. The purpose of this project is to examine how ankle ROM, YBT-LQ performance, and lower extremity muscle activation are affected by injury history and current pain of the lower extremity. Participants will include active collegiate athletes separated into healthy or injury/pain groups. Participants will be selected for the injury/pain group if they experience current pain or have experienced previous injury within the lower extremity which prevented participation in sport. Ankle ROM will be measured using the Weight Bearing Lunge and Plantarflexion Test established protocol with a digital inclinometer. Manual muscle testing will be performed using surface EMG to help determine muscle activation of the bilateral gluteus medius, rectus femoris, and gastrocnemius. Once ankle ROM and manual muscle testing has been complete, participants will perform the YBT-LQ for 3 trials bilaterally each in the anterior, posterolateral, and posteromedial directions. Muscle activation and YBT-LQ scores for each direction will be averaged and analyzed. We expect injury and/or pain in the lower extremities to be associated with limited ankle ROM, increased contralateral muscle activation in the gluteus medius, rectus femoris, and gastrocnemius, and lower performance on the YBT-LQ.

P554: ACUTE EFFECTS OF DIFFERENT STRETCHING METHODS ON LUMBOPELVIC-HIP COMPLEX MUSCLE ACTIVITY DURING THE GOLF SWING

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Shortened hip flexors and adductors limit motion at the lumbopelvic region, affecting motion in the frontal and transverse planes. Stretching can alleviate limited motion by increasing blood flow, loosening muscles and tendons, and increasing muscle activity prior to performance. Increased muscle activity could be advantageous towards facilitating greater rotational forces that benefit the unilateral golf swinging motion. Stretching prior to golfing could increase muscle activity, allowing for greater torque during the rotational swinging motion. However, whether dynamic or static stretching has the greatest immediate impact on muscle activity during the golf swing is unclear. Therefore, the purpose of this study is to examine the acute effects of different stretching methods that target the lumbopelvic-hip complex on muscle activity of the lumbopelvic-hip complex during the golf swing. Participants will include collegiate golfers between the ages of 18 to 24, divided randomly into two groups: dynamic stretching and static stretching. Muscle activity will be assessed using surface electromyography. Following placement of the electrodes and manual

muscle testing of the rectus femoris, semitendinosus, and lower latissimus dorsi, participants will perform three maximum effort swings with the driver before and after the stretching protocol. Both groups will undergo a ten minute stretching protocol for their corresponding stretching method, static or dynamic. Muscle activity will be measured during the swings and compared to maximal volitional isometric contraction (MVIC) values. Percent MVIC muscle activation will be averaged for the three trials before and after stretching protocol and analyzed to compare the impact of the stretching protocols on lumbopelvic-hip complex muscle activity. We predict an increase in muscle activity of the rectus femoris, semitendinosus, and lower latissimus dorsi in the dynamic stretching group compared to the static stretching group.

P555: EFFECTS OF INTER-SET REST INTERVALS ON PHYSIOLOGICAL AND PSYCHOLOGICAL MEASURES

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BACKGROUND: Inter-set rest interval (ISRI) is a popular topic in the exercise and sporting world. Heart rate (HR) and rate of perceived exertion (RPE) have been used for determining exercise intensity and training load. Blood lactate concentrations are considered a predictor of effort during resistance exercise. Prior research has tried to establish a relationship between rises in blood lactate and RPE during submaximal exercise. The purpose of this study was to determine if rest length affected RPE and readiness to lift for a subsequent set (RTL), and if HR and lactate measures correlated. It was hypothesized that rest length would impact physiological and psychological measures. METHODS: Nine adults participated (27.56±3.84 ys, 81.71±22.97 kg, 171.48±5.40 cm). Session one consisted of a familiarization period, establishing a 12 rep max (RM) on leg press. Sessions two and three were counterbalanced between 90s and 180s rest intervals while performing 2 sets of 10 reps of the 12RM where HR, lactate, RPE, and RTL were collected at five points (pre-set 1, post-set 1, pre-set 2, post-set 2, 10min post-bout). Statistical analyses were completed using SPSS. RESULTS: Paired samples t-tests between the variables of 90s vs 180s were non-significant. Paired samples t-tests yielded significant results of within rest time conditions for blood lactate and RPE for both the 90s (lactate p=.001; RPE p=.002) and the 180s (lactate p=.001; RPE p=.001) post-set 1 and post-set 2 of the leg press. Participants rated RTL on a visual analog scale (90s=6.41±1.92 cm; 180s=7.57±2.14 cm) with no significant differences (p=.291). CONCLUSIONS: Based on these findings, it was concluded that there is no difference between 90s or 180s rest periods with HR, blood lactate, RPE, or RTL for a 10-rep, 2-set bout of leg presses.

P556: MOBILITY, STRENGTH, AND NON-CONTACT INJURIES IN FEMALE COLLEGE ATHLETES.

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BACKGROUND: On average, college athletes experience more than two injuries a year, with 36.8% of them being non-contact injuries. Previous research has investigated several potential risk factors for increased rates of injury in college athletes, however there is little literature available about mobility and strength's association with non-contact injury in college sports. The functional movement screen (FMS) uses full body movements to evaluate mobility and assess injury risk based on a composite score. However, the common cut-off score of less than14 is not sensitive enough to detect increased injury risk in female athletes or in extremely flexible athlete populations, such as dancers. Strength as a factor contributing to injury has been well documented, however when in combination with mobility, the literature is limited and conflicting. The purpose of this study is to identify if a relationship between mobility (FMS), strength (handgrip), and non-contact injury exists in female college athletes. METHODS: We will recruit 50 female WKU college athletes for participation in this study. Participants will be given an IRB approved injury history survey to complete within the week prior to their data collection day. Once in the lab, participants will perform a hand-grip assessment with a dynamometer. Then, participants will be guided through the FMS, a test with a series of seven different movements to assess overall mobility. Reports of injury will be collected once per month via online survey. Once data collection is complete, we will implement a regression assessment to determine if there is a relationship between a participants' mobility, strength, and non-contact injury. ANTICIPATED RESULTS: We hypothesize that athletes with lower levels of mobility and strength will have a greater prevalence of non-contact injuries. There have been no non-contact injuries yet reported. Grant or funding information: CHHS Quick Turn-Around Grant (QTAG) was awarded for participant incentive.

P557: HEADACHES AND SLEEP IN COLLEGIATE STUDENT-ATHLETES: AN ANALYSIS OF BASELINE CONCUSSION DATA

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Headaches and Sleep in Collegiate Student-Athletes: An Analysis of Baseline Concussion DataGarrett F. Schmiederer, Caroline J. Ketcham, Eric E. Hall, FACSMElon BrainCARE Research Institute, Elon University BACKGROUND: Concussions and headaches are two distinct yet sometimes interconnected neurological conditions that significantly impact an individual's quality of life, particularly affecting sleep patterns. Understanding the interplay between these conditions and sleep is crucial for healthcare providers, patients, and researchers. On average a college student gets around 7 hours of sleep per night (Lund, 2010). Another symptom of concussions is headaches. Headaches can both cause sleep disturbances and be caused from lack of sleep. Headaches affect around 15.8% of the global population, with tension type headaches at 8.7% and migraines at 7% (Stovner, 2022). Headaches can cause insomnia and sleep apnea causing poor sleep quality. PURPOSE: The purpose of this study was to assess the relationship between headaches, sleep quantity, and sleep quality in collegiate athletes. METHODS: 178 athletes at the Varsity and Club levels from a mid-size, private southeast university took the Immediate Post Concussion Assessment and Cognitive Test (ImPACT) as part of their preparticipation baseline test. In addition they completed the Headache Impact Test (HIT) and the Pittsburgh Sleep Quality Index (PSQI) questionnaires. RESULTS: Data analysis shows that of the 178 participants 8.4% had frequent headaches (migraines, tension, cluster, and hypnic). Of those athletes with headaches 21.4% reported bad or fairly bad sleep quality and averaged 5-9 hrs of sleep per night. Out of the athletes without headaches 6.2% reported bad or fairly bad sleep within the same range of hours of sleep per night. CONCLUSION: The number of participants in this sample had less headaches than the general population, however sleep quality was still impacted. More research about the relationship between sleep and headaches in the collegiate population can help with concussion management protocols and supporting the well-being of student-athletes.

P558: THE EFFECT OF BLOOD FLOW RESTRICTION DURING ACUTE AEROBIC EXERCISE ON NON-LOCAL MUSCLE FATIGUE

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BACKGROUND: Non-local muscle fatigue (NLMF) is the reduction in performance of an unexercised limb following fatiguing exercise of different musculature. Alterations within the nervous system are believed to be responsible for NLMF, but few studies have used blood flow restriction (BFR) to determine if NLMF is augmented via neural decrements resulting from greater activation of inhibitory metabosensitive receptors. The purpose of this study will be to examine the influence of BFR during acute aerobic exercise on NLMF of the elbow flexors. METHODS: We will recruit 20 healthy subjects (10 male, 10 female), 18-35 yrs old. Subjects will complete an initial visit for familiarization and a maximal oxygen uptake test followed by 2 experimental visits. For the experimental visits, subjects will perform aerobic exercise on a treadmill at 40% of maximal oxygen uptake as measured by indirect calorimetry. These visits will be identical, except that BFR cuffs will be worn on the upper legs during the second visit until volitional fatigue or 15 min is achieved. BFR will be set to 50% of the minimum pressure to stop blood flow. The third visit will be volume matched, based on energy expenditure, to the BFR session but without BFR. Before and after each condition, subjects will perform a single rapid, maximum voluntary isometric contraction (MVIC) of the elbow flexors with electromyography (EMG) being recorded from the biceps brachii. Peak force, rate of force development, and rate of EMG rise will be calculated from the MVICs. Additionally, following each condition, 12 repeated MVICs will be completed to obtain a fatigue index (FI; % decline) for these outcomes. Two-way repeated measures ANOVAs will be used for analysis of single MVIC outcomes, whereas dependent samples t-tests will be used to compare FI outcomes. ANTICIPATED RESULTS: It is hypothesized that neither condition will

cause NLMF for single MVIC outcomes, whereas NLMF of FI outcomes will only be demonstrated following the BFR.

P559: CLUSTER SET REST REDISTRIBUTION ELICITS SIMILAR STRENGTH INCREASES COMPARED TO TRADITIONAL TRAINING IN TRAINED INDIVIDUALS

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Background: Resistance training adaptations rely on varying factors including volume, intensity, and rest. Theoretically, different training program designs can influence these adaptations. The purpose of this study was to compare changes in muscle strength following 4-weeks of cluster set rest redistribution (CLRR) structure and traditional (TR) set training structure. **Methods:** Eight trained males (height=172±27cm; body mass=85±4kg) and 7 females (height=164±4cm; body mass=71±13kg) participated in a 4-week training program consisting of unilateral leg extensions and curls twice a week. For each participant, one leg performed CLRR, and the other leg performed TR. The leg that performed each protocol was randomized for each participant. One repetition max (1RM) for leg extension and curl for each leg was estimated using a 3-rep max testing protocol before and after training. For training, participants performed the TR protocol involving four sets of leg extensions until volitional failure with 2 minutes of inter-set rest. Following completion of the TR training, participants performed the CLRR protocol, involving sets of 3 reps for the first 2 weeks and sets of 2 reps for the final 2 weeks. The total number of cluster sets was determined by dividing the total number of reps completed during TR by 3 or 2 respective to the week. The number of sets was then used to divide 360 seconds (total inter-set rest during the TR protocol) to provide the inter-set rest for CLRR. Workload for both protocols progressed from 70-85%, incrementally increasing each week by 5%. This was then repeated for leg curl. Change in estimated 1RM for leg extension, leg curl, and sex-based differences was examined using a mixed factorial ANOVA. **Results:** There were main effects for time for estimated leg extension and leg curl 1RM such that estimated 1RM increased for both protocols ($p<0.001$). There were main effects for sex such that males were stronger than females ($p<0.001$). **Conclusion:** When relative volume and rest times were matched between training methods, CLRR training and TR training resulted in similar increases in 1RM strength in resistance trained males and females. Thus, practitioners and strength conditioning coaches can utilize both methods for increases in muscle strength, particularly when volume and inter-set rest are equated.

P560: VERTICAL JUMP, DROP JUMP, AND SIMULATED BLOCKING: EXAMINING KINETIC LOWER LIMB SYMMETRY IN COLLEGIATE VOLLEYBALL PLAYERS

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BACKGROUND: Lower leg injuries in volleyball players are common. In order to more effectively coach and train athletes to limit injuries, a better understanding of jumping and landing kinetics is needed. Studies exist that examine jumping and landing that mimic volleyball gameplay, yet these studies lack consistency. They are also difficult to interpret because it remains unknown how volleyball athletes perform under traditional jumping and landing tasks. Therefore, the purpose of this study is to establish a baseline of jumping and landing kinetics in volleyball athletes using traditional jumping and landing tests. METHODS: This study will recruit 10 volleyball athletes (5 female, 5 male) out of season. Testing will take place during one 1-hour testing session. Forces gathered from two force platforms (one for each leg) will be examined for a number of dependent measures across three conditions: vertical jump, drop jump, and simulated blocking. Measures will include peak ground reaction force, time between peak forces, and total ground reaction force between legs. Demographic information will focus on years playing volleyball competitively, previous injury history, years participating in strength and conditioning programs, and whether or not athletes use braces or taping for any lower extremity joints. ANTICIPATED RESULTS: It is hypothesized that volleyball athletes will display kinetic patterns in jumping and landing that are highly symmetric both in force and time. From this, future studies will examine game-like motions and make systematic comparisons with baseline performance.

P561: ACCURACY IN DETERMINING SUB MAXIMAL VOLUNTARY ISOMETRIC CONTRACTION

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Background: The purpose of this study was to examine the ability of trained males and females to accurately estimate 25, 50, and 75% of their maximum voluntary isometric contraction (MVIC) knee extension (KE) strength prior to, during (MID), and following (POST) a 4-week training protocol. Methods: Seventeen (8 F; 9 M) trained subjects volunteered to participate in a 4 week training program consisting of unilateral leg extension 2x/week for 4 weeks. Each subject's legs were randomized to traditional exercise (TRAD), which consisted of 4 sets to failure with 2 minutes of rest between sets and cluster exercise (CL), which consisted of sets of 1-3 repetitions interspersed with shorter rest periods to volume- and work-match the TRAD leg. At PRE, MID, and POST subjects completed 3 submaximal contraction attempts at 25, 50, and 75% of their perceived MVIC KE strength prior to completing 2 MVIC attempts. Peak force (PF) was averaged across the 3 repetitions at each submaximal target and normalized to PF obtained during the MVIC. The target force was then subtracted from the normalized PF (NPFERROR) to examine changes in accuracy across contraction intensities and timepoints. Results: There was no significance target (25/50/75% MVIC) × time (PRE/MID/POST) × leg (TRAD/CL) × sex (M/F) or lower-order 3-way interaction effects ($p=0.067$-0.863). There was a significant target × sex interaction effect ($p=0.04$), in which post-hoc analyses indicated that when collapsed across both time and leg, the NPFERROR significantly differed between all intensities in both males and females ($p<0.001$ for all). Specifically, the NPFERROR at the 25% (M: +8.1±13.3 %MVIC; F: +16.2±18.3 %MVIC) was significantly greater than NPFERROR at 50% (M: -2.0±14.0 %MVIC; F: +4.5±18.0 %MVIC), which was significantly greater than the NPFERROR at 75% (M: -11.7±13.2 %MVIC; F: -11.4±14.8 %MVIC). There were no significant differences between sexes at any target ($p=0.168$-0.948). Conclusions: The data suggests that the ability to accurately produce submaximal isometric force significantly varies based on target, with greater NPFERROR on the lower (25%) and higher (75%) target force levels. There were no differences in NPFERROR between males and females nor across, during or following a 4 week program.

P562: ANALYZING VERTICAL GROUND REACTION FORCES AND COORDINATION OF MEDIAL LATERAL GROUND REACTION FORCES IN JUMPING

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BACKGROUND: Jumping is a dynamic movement dominant in many sports and used in athletic assessment; however, there is minimal knowledge comparing vertical ground reaction forces (VGRF) and coordination with medial lateral ground reaction forces (MLGRF) in jump height (JH). The purpose of this study was to measure the level of in-phase (IP) and out-of-phase (OP) coordination between VGRF and MLGRF using continuous relative phase (CRP) and estimated jump height performance. **METHODS:** Thirty-six professional soccer players (20.78±1.67yrs, 176.82±8.97cm, 73.98±10.10kg) were included in this study. Manual muscle tests were conducted prior to jumping protocol. Three bilateral counter-movement jumps (CMJ), two right single-leg counter-movement jumps (RSL), and two left counter-movement jumps (LSL) were performed on bilateral force plates. Participants were instructed to pause prior to each jump. Univariate linear regression model examined relationship between Total VGRF vs Total MLGRF RMS CRP and Jump Height. **RESULTS:** Total VGRF vs Total MLGRF RMS CRP was not predictive of jump height (R^2**=-**2.227**),** suggesting a non-linear relationship between the two variables. **CONCLUSION**: This pilot study examined jump height in professional athletes. Preliminary results do not suggest a significant correlation between Total VGRF vs Total MLGRF RMS CRP and estimated jump height. Future research examining multiple predictors of jump height or looking at each leg individually (right vs. left) is warranted.